12/07 Searched archives for:

- Internal corresp. 1920-21 (we have for 25-26, not 20-21)
- involvement of Westinghouse in radio conferences + Herbert Hoover
- any radio ads, esp fr 1920
- any contemporaneous accts of business dealings

* '20-'22 are our years of interest

- RCA + tug-and-pull re what NBC should be
- why + when AT+T gave up broadcasting

Summary Information

Title: Harry Phillips Davis Collection
Collection Number: ais196421
Creator: Harry Phillips Davis
Collection Dates: 1915-1944
Extent: 1.87 linear feet (4 boxes)
Abstract:

Harry Phillips Davis was a mechanical and electrical engineer who worked for the Westinghouse Electric and Manufacturing Company. He eventually rose to the position of Vice-President in charge of Manufacturing and Engineering for Westinghouse. During his tenure, Davis helped bring about the first commercial radio station in the United States, KDKA. His papers consist of memorandum, correspondence, biographical information, clippings and material from his estate.

Language:

The material in this collection is in English.

Repository:

Archives Service Center
University Library System
University of Pittsburgh
7500 Thomas Boulevard
Pittsburgh, PA 15260

Sponsor:

This finding aid has been encoded as a part of the Historic Pittsburgh project a joint effort of the University of Pittsburgh and the Historical Society of Western Pennsylvania. Funding for this portion of the project has been donated by the Hillman Foundation.

Date Published:

Fall 2000

Author:

This guide to the collection was originally prepared by ASC staff. Revisions occurred to the finding aid as a part of the encoding process in February 2002.

Encoder:

Encoded by Eric Skinner in February 2002 from an existing finding aid. Reviewed by Archivist on February 22, 2002.

Revision Description:

July 1, 2006:

Converted from EAD Version 1.0 to EAD Version 2002

History

Harry Phillips Davis was born on July 31, 1868 in Somersworth, New Hampshire. He received his B.S. in mechanical engineering from Worcester Polytechnic Institute in 1890 and B.S. in electrical engineering in 1891. In 1892 Davis married Agnes Taylor.

After starting his career at the Thompson Houston Co. in 1891, Davis resigned and moved to East Pittsburgh, Pennsylvania to work for Westinghouse Electric and Manufacturing Company. Davis presented Westinghouse Management with an opportunity to develop what is known as "electrical detail apparatus," which are devices such as switches, insulators and rheostats.

In 1892 Davis was appointed to organize and develop Westinghouse's Detail Engineering Department. In 1909 Davis was named the Manager of Engineering for Westinghouse and was elected to the post of Vice-President in charge of Manufacturing and Engineering in 1911.

Davis was known for his ability to complete assigned tasks quickly and under budget. Some of the projects include Hoosac Tunnel, St. Clair Tunnel and the electrification of the Pennsylvania Railroad Terminal. Davis also completed a massive managerial task during World War I, supervising the conversion of Westinghouse's Pittsburgh plant from electrical manufacturing to the production of munitions.

Davis is perhaps best known as a pioneer in the radio field. According to the National Radio Club's website, Davis saw the possibilities of radio broadcasting for mass communications. He approved the creation of KDKA, which went into service on November 2, 1920.

KDKA was largely the result of the work of Frank Conrad, an engineer at the Westinghouse company. Conrad began experimenting with broadcasting radio programs from his home in Wilkinsburg, PA in 1916 and continued throughout World War I. Interest in the programs rose and a local merchant advertised radio receivers on Conrad's broadcasts. Davis recognized the commercial possibilities and led an effort to build a studio

and a more powerful transmitter on the roof of the Westinghouse K building in East Pittsburgh. His efforts to promote radio extended to his participation in the creation of the Public Broadcasting Company. This company combined the radio stations of Westinghouse, General Electric and the Radio Corporation of America. Davis served as chairman of the board of directors of the National Broadcasting Company at the time of his death.

Davis died on September 10, 1931 in Pittsburgh, and is buried in Worcester, Massachusetts.

Collection Scope and Content Note

The Collection of Harry Phillips Davis is divided into eight series contained in four boxes. Among the material in the collection are correspondence, memorandum, newspaper and magazine clippings, news releases, photographs and speeches.

Controlled Access Terms

Topics

- Radio broadcasters
- Radio broadcasting -- History

Personal Names

- Davis, Harry Phillips, -- 1868-1931
- Aylesworth, Merlin Hall, -- 1886-1952 -- Correspondence
- Harbord, James G. -- (James Guthrie), -- 1866-1947 -- Correspondence
- Herr, E. M. -- Correspondence
- Hoover, Herbert, -- 1874-1964 -- Correspondence
- Byrd, Richard Evelyn, -- 1888-1957 -- Correspondence

Forms

- Broadcasters -- Correspondence
- Broadcasters -- Speeches
- Broadcasters -- Scrapbooks
- Broadcasters -- Clippings
- Broadcasters -- Memorabilia
- Broadcasters -- Personal papers
- Broadcasters -- Estate records

Access and Use

Access Restrictions:

Access to series six is restricted. For information on this material, please contact the Archives Service Center.

Aquisition Information:

The material was a gift of Sherburne B. Rockwell, Jr. on March

2, 1964.

Preferred Citation:

Harry Phillips Davis Collection, 1915-1944, ais196421, Archives Service Center, University of Pittsburgh

Processing Information:

This collection was processed by ASC Staff.

Copyright:

Contents List

Series I Biographical Data

Scope and Content Notes:

Includes a copy of a manuscript for an article on Davis for Forbes Magazine. Also has a file of biographical data to be used in The Story of Electricity and press releases on Davis from the National Broadcasting Company.

Box 1

Folder	1	Davis, H.P. Biographical Data
Folder	2	National Broadcasting Company, Inc. New York. Press Releases re Davis
Folder	3	File relating to biographical data on H.P. Davis to be used in *The Story of Electricity* 1920-1922
Folder	4	Manuscript, with corrections and revisions, of an article prepared by Mrs. O.D. Foster for *Forbes Magazine*

Series II Business Correspondence and Memorandum

Scope and Content Notes:

The series includes information on the development of advertising in radio, the creation of the American Broadcasting Company and the development of radio broadcasting in the United States. Also included is information on the Canadian Westinghouse Company and radio broadcasting in Europe. A recurring theme in the correspondence is Davis' attempts to use the medium of radio to its greatest advantage. Major correspondents include M.H. Aylesworth, president of NBC; B.A. Behrend,

engineering consultant; General J.G. Harvard, president, Radio Corporation of America; and E.M. Herr, president of Westinghouse Electric Manufacturing Company. The correspondence includes a letter from President Herbert Hoover concerning the 10th anniversary of radio broadcasting. The correspondence in folder eleven concerns Davis' lectures, speeches and writing on the radio industry.

The memorandum in folders 12 and 13 include memos from David Sarnoff, president of the National Broadcasting Company and material on the development of radio.

Hoover pres 29-33
Com sec'y 21-28
Radio conf (1927)

		Business Correspondence
Folder	5	1915, 1920
Folder	6	June 1924-1925
Folder	7	January-May 1926
Folder	8	October-December 1926
Folder	9	1927 ←
Folder	10	August 1928-July 1931 → Hoover started presidency
Folder	11	Lectures, addresses, books, 1928-29 → 11
Folder	12	Memorandum proposing organization of a broadcasting company
Folder	13	Memorandum from J.C. McQuiston
	Series III	**Addresses, Radio Broadcasts, Publications and Articles on Davis**
Folder	14	Addresses, Talks, Article Copy 1919-1927 → radio conference
Box 2		
Box	2	Addresses, Talks, Article Copy
Folder	15	1928 → Hoover still com sec'y
Folder	16	1929-31 → Hoover started presidency
Folder	17	Broadcasts
Folder	18	Publications
Folder	19	Issues of periodicals containing articles by H.P. Davis
	Series IV Works Manager's Meeting	
Folder	20	Works Managers Meeting, Minutes, October 6-8, 1924
	Series V Photographs, Memorabilia and Davis' Eulogy	
Folder	21	Photographs
Folder	22	Memorabilia
Folder	23	In Memoriam
	Series VI Classified	— ? — Access to these materials is restricted
Folder	24	Aylesworth, M.H.

classified / restricted material

? —	Folder	25	Conrad, Dr. Frank
	Folder	26	Horn, C.W.
	Folder	27	Morse, Miss Edith B.
	Folder	28	Rockwell, Sherburne B., Jr.
? —	Folder	29	Sarnoff, David
? —	Folder	30	Broadcasting
	Folder	31	H.P. Davis Memorial Announcers' Award
	Folder	32	Radio Station WJZ (Bound Book, N.J.; New York, New York)
	Folder	33	Ransom C. Taylor Trust
? —	Folder	34	Radio Station KDKA, Pittsburgh, PA
? —	Folder	35	Westinghouse Electric and Manufacturing Co. Correspondence relating to radio station KDKA, 1924-1925

Series VII Scrapbooks

Box 3

Box	3	Newspaper Clippings
Folder	36	1921-1922
Folder	37	1923-1924
Folder	38	1925
		Clippings About Radio
Folder	39	Advertising
Folder	40	Communications
Folder	41	Legal
Folder	42	Statistical
Folder	43	Television
Folder	44-45	Miscellaneous
Folder	46	H.P. Davis address in Buffalo and Washington on Radio

Box 4

Box	4	News Clippings
Folder	47	H.P. Davis
Folder	48	Broadcasting Industry
Folder	49	Radio Station KDKA
		Publications
Folder	50	Radio Corporation of America
Folder	51	The report of an investigation made among radio owners of Missouri and Illinois showing individual preferences

clippings from this box are in too poor condition to copy

of interest but can't be copied *

Series VIII Davis Estate

Davis Estate

Folder	52	1931, May 1944
Folder	53	June 1944
Folder	54	July-September 1944
Folder	55	Davis, Mrs. H.P.

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University of Pittsburgh
Archives Service Center
PHOTOCOPY REQUEST FORM

Name Susan Burgess

Address P.O. Box 8090 McLean VA, 22106

Phone Number E-Mail Susan@cwx.com

Special Instructions:

Materials Requested

Collection Number	Box Number	Folder Number/Description	Number of Pages	Completed By
64:21	1	FF5: Business Corr. 1915, 1920 (entire Folder)	3	SZB
"	"	FF6: Business Corr. Jun-Dec. 1925 (entire Folder)	68	SZB
"	"	FF7: Business corr. Jan-May 1926 (entire Folder)	38	SZB
"	"	FF8: Business corr. Sept.-Dec. 1926 (entire Folder	153	SZB

over

STAFF USE ONLY *(Please initial)*

Date Requested 01/03/2007 Date Completed 1/5/07

Date Needed 01/08/2007 Invoice Sent

Mail X Pick-up Payment Received pd 01/03/2007

4/01

RADIO

By DAVID SARNOFF—AS TOLD TO MARY MARGARET McBRIDE

ILLUSTRATED BY WYNCIE KING

ON A STEAMING day in the summer of 1906, a chubby, excited boy sleuthed down lower Broadway in New York City behind a slim young man, who darted amid the traffic at real peril to life and limb.

Although the young man was obviously too absorbed in his own thoughts to notice anybody, the boy took care to hide himself well in the crowd. Being a romantic youth, he believed that the man wished to keep his destination a deep, dark secret.

"He's got a den somewhere and he makes lightnin' out of nothin' at all," a fellow office boy had volunteered zestfully that very morning. "Prob'ly he's figgerin' how he'll make thunder next."

This hint of mystery was all I needed—for it was I—to be straightway turned into a detective. I had more than my share of curiosity—and I simply had to see that den. Call it fate, or what you like, that very afternoon I was let off just as the reputed manufacturer of lightning, who was none other than Guglielmo Marconi, went out the office door.

Red and perspiring after sundry escapes from being run over by dray horses, I finally tracked the inventor to a little place on Front Street where there was no forge of Vulcan at all, but only a small, not very well equipped laboratory, where he spent most of his time in New York.

That day's adventure was the dawn of radio for me. It was little past the real dawn of radio, for that matter, since it was only six years after Marconi had thrilled the world with his announcement that, by means of a wireless apparatus, he had received signals on two successive days over a distance of 1800 miles, and had begun to make history that hasn't stopped growing yet.

The signals consisted of three dots—the famous Morse letter S—repeated twenty times and were sent on December 13 and 14, 1901, from Poldhu, Great Britain, to St. John's, Newfoundland.

I say the world was thrilled by this announcement. I doubt if this was precisely true. The innovation probably sounded too outlandish and unreasonable to be believed by most folks. The newspapers featured it for one day on the front page, and scientists were interested. I imagine that was about all, for who could suppose that in less than twenty years people would be getting pictures and voices out of the air and regard it all as commonplace?

Dave, the Telegrapher

CERTAINLY no precocious premonition that I was close to history in the making entered my head as I tracked Marconi to his little laboratory. All I felt was a boy's curiosity about a man who could work miracles with machines.

I might never have seen Marconi if I had not early in life decided to be a newspaper man. This ambition is as common to boys as the stage fever is to girls. My connection with wireless and radio, which has now lasted for twenty years, grew out of it.

As a matter of fact, I went into the newspaper business early in life. That is, I had a paper route and later a news stand on the West Side, so I thought I knew a thing or two about journalism. Then ambition stirred and I abandoned the news stand to search for a real newspaper job.

I went down to James Gordon Bennett's old Herald office at Broadway and Thirty-fifth Street and walked into the first door I saw. It happened to be the entrance to the Commercial Cable Company. A red-haired man was there.

"I'd like a job on the Herald," I announced with a good deal more boldness than I felt.

"We need a messenger here at five dollars a week, ten cents an hour for overtime," the man answered doubtfully. They had been advertising that very day for a boy.

My heart was going like a pile driver, but I managed to stammer, "All right, am I hired?"

He said yes. Of course it wasn't really a newspaper job, but I did carry messages to the Herald office and was duly thrilled by my slight contribution to the printed page. I had only one ambition then—to become one of Mr. Bennett's bright young men.

Pretty soon, though, I got interested in the telegraph. I saved up two dollars and bought an instrument, which I learned to work by watching the operators. Then I took my new toy home. The thing increased my standing on the block tremendously. Everybody wanted to see the queer contraption, and for several days, whenever I was there, our flat was filled with an awe-struck group of neighbors "watching Dave telegraph." Seeing that I didn't get on very fast with such an audience, my mother locked the other children away for a certain period each day while I practiced my Morse code.

I worked eight months with the cable company, and then, because I was genuinely interested in wireless and in Marconi, I got a job with the Marconi Company of America.

It still wasn't exactly what I wanted. I aspired to be an operator and was only an office boy, but at least my wages were increased fifty cents a week. Furthermore, I now felt privileged to hang around the laboratory on Front Street whenever I had a spare moment. James Round, known to me as Jimmy when I got over my first bashfulness, was boss there; and since there was a good deal of dirty work a boy could do to help about the place, he let me mess to my heart's content. I blew out hundreds of fuses and have calluses on my fingers to this day where I burned them.

Sundays and evenings, it was natural that I should read about Samuel Morse and his feat on May 24, 1844, of transmitting the famous message, "What God hath wrought," over an experimental telegraph line from Washington to Baltimore and of his early attempts to send wireless messages across a canal at Washington, using the slight conducting power of the water to carry the electric-telegraph current from one side to the other.

The history of the decade which followed, when others tried the same plan, some succeeding but none getting beyond the experimental stage, interested me, too, as did the story of Alexander Bell, who, in 1882, used his telephone receiver connected to plugs below the water's surface to send messages from the land about a mile and a half to a boat on the Potomac River. My reading skipped as agilely from one country to another as did the progress of invention itself.

A Swivel-Chair Sea Captain

I READ that Thomas Edison and his associates, in 1885, were proposing to support, high above the earth's surface and at some distance from each other, two metallic plates, which should be a sending and a receiving machine between which electric rays were supposed to extend, and that Heinrich Hertz, working at Karlsruhe, Germany, was at the same time creating and detecting electromagnetic waves, confirming the theory of Professor James Clerk Maxwell, of Edinburgh, and laying the foundation for radio as it is today.

As I read, my head was filled with dreams of high accomplishment. I watched Jimmy Round working what seemed to me wonders in his laboratory, and saw the operators coming into the Marconi office from their ships, browned by exposure and so full of tales of adventure that you had only to tap them craftily with appropriate questions to enjoy an Arabian Nights feast.

I resolved then and there that I would never be an official—a dullard in a swivel chair, issuing orders to better men. Alas for boyish dreams! Today I am an official, tilted back in a swivel chair, giving orders to men who go down to the sea in ships. Yet I had my little adventurous fling first, as you shall see.

One day I heard that we were to send two operators to an electrical show in Louisville, Kentucky. I happened to know that the company was short of operators, so I begged to be taken as assistant to an experienced man.

For the first time in my life I rode in a Pullman and slept and ate in a hotel. The man whom I assisted must have spoken a good word for me, for when we came back I was made operator of a telegraph line connecting the main office with our Sea Gate station. It wasn't a very important post, and I was only sixteen, but I felt that the whole company would go to pieces on the hypothetical day that I should fail to report for duty.

As I look back now, I realize that it wouldn't have taken a great deal to blow up that company. The wireless business was not making money in those days. Sometimes, indeed, when Saturday pay day came around, I, as head office boy, would be sent out to friends of John Bottomley, our general manager, to borrow funds to pay off. Bottomley, poor fellow, did the best he could; but it was hard going, for there were only four ships—the New York, the St. Louis, the Philadelphia and the St. Paul—equipped with Marconi wireless, and only four land stations—Sea Gate at Coney Island; Sagaponack, Long Island; Siasconset, Nantucket, Massachusetts, and South Wellfleet, on Cape Cod, Massachusetts. There were, too, all sorts of patent tangles, and the courts were never free of wireless litigation that dragged on and on, eating up profits.

The public had at that time no particular stake, and therefore no great interest, in wireless. It is difficult to say just how far away present-day broadcasting was from the average mind then. True, there were a few amateur wireless-telegraph sets in existence, and some embryonic attempts had been made with experimental wireless telephony. Of this, however, the public knew little. We heard a good deal of it at the Marconi Company's, because wireless was naturally shop talk with us.

I heard enough, at least, to make the routine round of a city office irksome, and in 1908, when I found they needed an assistant wireless operator for the coastal station at Siasconset on Nantucket Island, I applied for the place. Not only that, I pleaded for it. I didn't have a great deal of opposition, for it was a dreary station, except for a few

weeks in summer, and men hated to stay there. That did not discourage me, nor did the fact that I had never been away from home before.

I got the job chiefly because it was only for a month, to relieve Jack Irwin, later to become famous in the history of wireless when he went up in 1910 as an operator in Wellman's airship. That party consisted of six men who tried to cross the ocean in a ship equipped with an equilibrator. They fell into difficulties off the Bermudas and Jack had to sound the CQD signal. They were all picked up by the steamship Trent.

Jack's roving spirit, or perhaps the prospect of some similar enterprise, had caused him to apply for a month's leave of absence, and so I got my chance. My reception at that station was something to remember. The other men greeted me with exaggerated politeness, pretending to defer to my opinion about this and that. They were all twice as old as I was, and our most experienced operators.

Since I was accredited by the main office, the manager finally decided that I might be allowed to stand the regular eight-hour trick. He was not convinced about my ability, however, and stood at my elbow most of the time.

When the month was up I went back to New York, and Irwin being still away, was promptly ordered to Siasconset again; this time for eighteen months. It was winter then and not a bit of fun. We had to generate our electricity and look after our own equipment. There was no steam heat, electric lights or running water. I lived alone in a barnlike two-story house and ate at a near-by farm. My only social life came from romps with Alma, four-year-old daughter of the station's manager, A. H. Ginman. She was a gay, pretty little thing whose frolicsome ways made life half bearable.

There was one other compensation—I had plenty of time to read. It is astonishing how much a boy can learn about things he is interested in, and conversely, of course, how little about things that bore him. By that time I had forgotten my itch for newspaper work and was resolved to follow wireless as a profession. I read with eager absorption such meager accounts as I could get of experimental demonstrations of the wireless telephone made here and there. These tests showed that speech carried through a wireless station could be broadcast on the wings of the electromagnetic wave, to be received with ordinary wireless receivers and heard through head sets.

A Big Day in Wireless History

I LEARNED a lot about practical engineering in the Siasconset period, too, for when the dynamos and motors went wrong I was allowed to fix them up. At this time, also, although it may be an irrelevant detail, I met Abraham Lincoln in my reading and took him for my model of the ideal American.

After a while, though, I grew restless again and had just been transferred to Sea Gate, which offered less salary but more adventure, when on January 22, 1909, came an event that stirred and thrilled every man in wireless work.

Just before dawn of that cold, foggy morning the Steamship Republic, of the White Star Line, bound from New York to the Mediterranean, and the steamship Florida, of Italy, crashed into each other twenty-five miles south of Nantucket Light. The steel bow of the Florida crumpled like paper, and water began to rush into the Republic through a great gash in her side.

Panic-stricken passengers of the two vessels, nearly 2000 in all, rushed on deck. The Republic was sinking. Women and children sobbed and prayed. Men stood by the rail, cursing their helplessness. So unaccustomed was the public to the wireless that few on the Republic remembered that the vessel carried equipment and an operator.

There was a call for the lifeboats. Yet if the passengers took to the lifeboats they must perish of cold and exposure, unless help came. Then word was passed that the operator in his little wireless room on the upper deck was trying to reach the outside world with tidings of the disaster.

Like condemned prisoners granted a reprieve, the passengers cheered wildly and crowded in that direction. The roof and three sides of the wireless cabin had been splintered to matchwood by the collision, and two bodies lay crushed, half buried beneath débris; but the operator, Jack Binns, went steadily on sending the CQD distress call over and over. For five minutes he sent in vain, for the current was cut off by the flooding of the dynamo room. He connected with a weaker current from the storage batteries and tried again. At last from Siasconset came an answering signal, "All right. Who are you?"

Back went Binns' reply, "This is the Republic. We are shipwrecked."

The Siasconset operator began to call revenue cutters and liners such as the City of Everett, the New York, the Lusitania and the Baltic. All the same, it looked as if the Republic would sink before help could come, and the passengers were taken aboard the Florida. Binns, however, stayed at his post to direct the course of the rescuers. Not until cables were made fast to the wreck did he leave the ship. His last message was, "Current going. Wireless now closed."

In the general relief over the happy ending to what might have been a terrible tragedy, the world awoke to the need for radio on shipboard, and today all seagoing vessels carrying fifty persons or more are required by international law to include radio equipment and competent operators.

Jack Binns' feat excited all my hero worship and my ambition too. I became manager of the Sea Gate station, but the desire for travel smote me with a violence that could no longer be resisted. I reached the limit of my endurance on the day that a notice was posted asking for wireless operators in the Arctic ice fields. When I answered the call and sped northward I had the feeling that at last I was off to seek adventure.

The steamship Beothic, to which I was assigned, had never carried wireless equipment before, and so my apparatus and I were the objects of a rather skeptical curiosity. In the days when we were getting ready to set off I heard many tales of the perils of seal fishing, of starvation, of freezing, and the like. It was a disappointment and yet a thrill to discover that wireless was able to a great extent to strip the frozen wastes of their dangers. For the fishing it was valuable too. Seals travel together in great numbers, and it is not unusual for a vessel to miss the main group and return home empty-handed or with but a light load. Vessels of the same line equipped with wireless can communicate news of a good location and save the catch for the company.

The fishermen on the Beothic called me the Coni Man and were always anxious to know the latest news from their neighbors, chiefly whether anybody had made a better catch than they had. I think they never really believed at first that I was in communication with those other ships out over the ice, but the idea amused them and they were willing to humor my imagination. So they accosted me daily with the question: "Any bit of fresh news this marnin', Coni Man?"

One day I gave them a real surprise. Word came from the sealing company that a boy had been born to the wife of one of the men, who was standing by my side at the very moment. A wild yell went up from the new father when I told him, and another from the other men when he passed the glad tidings on. That night a celebration was held on board in honor of the wireless and the new baby.

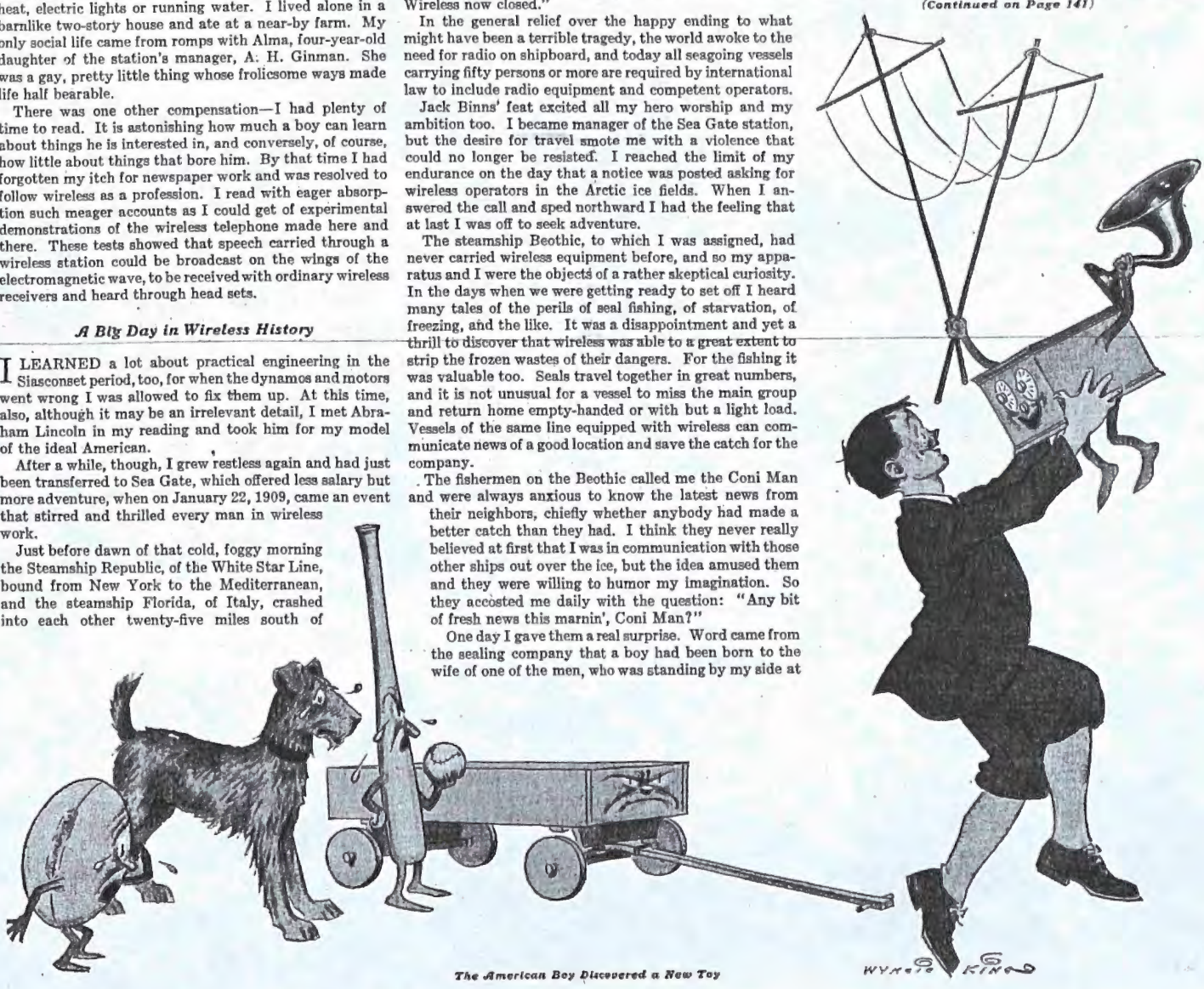
Another dramatic message was brought by the air that day. A few hours later the operator of a vessel 100 miles away called frantically for help for a member of the crew suffering from a serious internal injury. The symptoms were described in detail and I wrote them out for our physician. He prescribed a course of treatment, which I relayed. Another ship picked up the message, and from all parts of the ocean we were bombarded with requests for medical aid for every complaint from bunions to bald spots.

A Call on the Ship's Doctor

ON ANOTHER day, out of the icy ether came a worried plaint from my friend Jack Daw, operator at Belle Isle, Newfoundland. "I am up against it," he wirelessed. "My assistant is terribly ill and seems to be getting worse instead of better. His cheeks are swollen, his temperature is high, and he can eat nothing. He has a bad toothache, too, and hasn't been able to get out of bed for nearly a week.

"Our only neighbors are the head lighthouse keeper, his assistant and the assistant's wife. There are two lighthouse keepers on the other side of the island, but we are

(Continued on Page 141)



The American Boy Discovered a New Toy

RADIO

(Continued from Page 9)

separated from them by ten miles of wind-swept ice. The Canadian Government vessel comes here twice a year to bring fuel and provisions, but in the ice season we see nobody. It will be three months before time for the government ship. Only a sealing vessel could get in."

Our doctor made a few more inquiries, and then, with as much assurance as he could feel at such a distance, diagnosed the case as an abscess. The diagnosis was simpler than the remedy, for in the medicine chest 200 frigid miles away there were only calomel and liniment.

We were headed in the general direction of Belle Isle, but when the doctor and I went to the captain and begged him to turn the ship directly that way we got little encouragement. He was one of the silent, unemotional men of the north, and the most expansive observation usually to be got out of him was a grunt, or on bad days a snort.

Meantime the news about Barrett was more serious every day. Finally, in desperation, I advised Daw to send a message to the captain direct. I worded it myself. It said: "My assistant is dying. Unless you come at once with a doctor, it will be too late."

I thought the captain showed a flash of feeling when I delivered this, but he said nothing. Several days dragged by. The doctor sent hourly advice to Daw. Then came a message that made us wince in our helplessness. Symptoms indicated that blood poisoning was setting in. The doctor himself carried this word to the captain and was starting to make a last despairing appeal when that rocky-faced old fellow told him the vessel was headed for Belle Isle and would be there in six or seven hours. I broke the wireless speed record with that news. I didn't wait to get back Daw's aerial whoop of joy, though, but ran back to gather up blankets, pillows and what comforts we had on board for the sick man. The fishermen, all sympathy, contributed every jelly and cake their wives had given them at parting, and even such liquid refreshment as was carried for medicinal purposes.

We came to a stop two miles from Belle Isle and ten of us started to cross the ice to the wireless station. The Belle Isle lighthouse is nearly 500 feet above sea level, on a mountain of ice and snow. Seven members of our party dropped out before we got to the top. The doctor, the captain's son and I, who went on, were gulping for breath at the end of the climb.

Saving Barrett's Life

Daw, literally speechless with joy, led us into the coldest, dreariest room I have ever seen. On a rickety old cot in the warmest corner lay the sick boy. His hair was matted and his hollow cheeks were covered with a stubble beard. Emaciated from twenty days in bed, during every minute of which he was racked with intense pain and was insufficiently nourished, he looked like a grotesque ghost of a wild man.

When he saw us and realized that perhaps help had come before it was too late, he broke down completely. Later the doctor examined him and found that three teeth must be taken out at once. The doctor was not a dentist, but was willing to try the operation; only, he was reluctant to leave the patient afterward for fear blood poisoning might set in. Yet he must go on with his ship.

I had to put it up to Barrett. He might undergo the operation then and there and take his chances, or we could carry him back to the ship and drop him at St. John's. I pointed out that the second would be the safer course. I was kneeling by the boy's cot and he was holding to my hand. He was in frightful pain, but when I had finished he smiled as well as he could with his swollen cheeks, and said, "I'll stay here. I wouldn't leave Daw after the way he's stood by me."

He held to this decision, even though Daw pleaded with him to go with the ship. The operation was finally performed in the dark little room, with me as the wabbly surgeon's assistant, and in spite of the difficulties it was successful. Before we sailed away we had the satisfaction of knowing that the patient would get well.

It was tremendously exciting to me to realize that wireless had literally saved Barrett's life. Since then I have seen and heard of many incidents of the kind, but the thrill is still there. I have seen surgeons operate by wireless, dictating every move to some less skilled person standing beside a patient whose only chance for life was bound up in the message coming out of the air. The time will never be when such a thing can seem commonplace to me.

From 1907 to 1912 wireless advanced slowly. One development of 1912 was a radio conference in London, in which the United States, together with many of the other nations of the earth, took part. At this meeting wireless communication was first called radio. The term was based upon the fact that signals are radiated outward in all directions in most forms of transmitters.

In 1912 also came another and greater tragedy than that of the Republic to force commercial and scientific development onward with unprecedented speed. This was the sinking of the Titanic.

News of the Titanic Disaster

I came back to New York from the ice fields in 1910, and when John Wanamaker decided to equip his New York and Philadelphia stores with radio stations more powerful than any then installed in the commercial field, I applied for the place of operator, because it would leave my evenings free to take a course in engineering at Pratt Institute. So it happened that I was on duty at the Wanamaker station in New York and got the first message from the Olympic, 1400 miles out at sea, that the Titanic had gone down.

I have often been asked what were my emotions at that moment. I doubt if I felt at all during the seventy-two hours after the news came. I gave the information to the press associations and newspapers at once and it was as if bedlam had been let loose. Telephones were whirring, extras were being cried, crowds were gathering around newspaper bulletin boards. The air was as disturbed as the earth. Everybody was trying to get and send messages. Some who owned sets had relatives or friends aboard the Titanic and they made frantic efforts to learn something definite. Finally, President Taft ordered all stations in the vicinity except ours closed down so that we might have no interference in the reception of official news.

Word spread swiftly that a list of survivors was being received at Wanamaker's and the station was quickly stormed by the grief-stricken and curious. Eventually a police guard was called out and the curious held back, but some of those most interested in the fate of the doomed ship were allowed in the wireless room. Vincent Astor, whose father, John Jacob Astor, was drowned, and the sons of Isidor Straus were among those who looked over my shoulder as I copied the list of survivors. Straus and his wife went down too.

I remember praying fervently that the names these men were hoping to see would soon come over the keys, but they never did.

Much of the time I sat with the ear phones on my head and nothing coming in. It seemed as if the whole anxious world was attached to those phones during the seventy-two hours I crouched tense in that station.

I felt my responsibility keenly, and weary though I was, could not have slept. At the end of my first long tryst with the

sea, I was whisked in a taxicab to the old Astor House on lower Broadway and given a Turkish rub. Then I was rushed in another taxicab to Sea Gate, where communication was being kept up with the Carpathia, the vessel which brought in the survivors of the ill-fated Titanic.

Here again I sat for hours—listening. Now we began to get the names of some of those who were known to have gone down. This was worse than the other list had been—heartbreaking in its finality—a death knell to hope.

I passed the information on to a sorrowing world, and when messages ceased to come in, fell down like a log at my place and slept the clock around.

The Titanic disaster placed the Marconi Company in undisputed leadership of the wireless field. Investors, realizing the need for radio, put up plenty of capital to give the company new facilities and thus turned this small organization into a large one. The United Wireless Company, one of the small groups which had also struggled along under great handicaps, was consolidated with Marconi, and by degrees more and more ships were equipped, together with coastal stations designed for ship and shore communication. In 1913, 500 American vessels were fitted with radio.

The fly in the ointment was that, even though it was located in America, the Marconi Company was organized by British interests and operated under foreign control. Wireless was not yet a native product.

Then a strange thing happened. The American boy discovered a new toy. He found that he could send messages out into space to be picked up by his friend on the other side of town, or even in a neighboring town. He grew so enthusiastic about his vivid plaything that he drew first his big brother and then his father into the charmed circle of interest. In several hundred homes throughout the country, amateurs united with scientists already working in laboratories to bring nearer the day of broadcasting as we know it now.

Occasionally a story crept into the newspapers about some home-town boy in Missouri or Maine or Montana who had got signals of distress from vessels at sea. Imaginative persons, looking up at infrequent aerials, shivered with pleasurable awe at the thought of modern magic. By 1915 the engineers of the American Telephone and Telegraph Company had succeeded in talking by radio from the huge naval station at Arlington, Virginia, to Paris, and in the opposite direction to Honolulu. This feat was accomplished by using vacuum tubes as oscillators and voice magnifiers. The power of the transmitter was utterly inadequate to signal over so huge a distance except under the most favorable conditions. But radio was becoming part of the national consciousness.

Who Was the First Broadcaster?

Meantime the foundation for a great American controversy was being laid. "Who was the first broadcaster?" everybody asks me. The answer to this question depends, it seems to me, upon the meaning of the phrase. In a sense, the first radiotelephone message sent—and dozens claim to have sent it—was the first broadcasting. Because of the very nature of radio, the message went out in all directions and could be picked up by anyone whose receiving facilities were adequate.

I believe, however, that the effort of KDKA, at East Pittsburgh, in sending out the presidential-election returns November, 1920, would be accounted the earliest broadcasting on an organized basis of service to the public.

The event at KDKA was the result of amateur experimentation by Frank Conrad, now assistant chief engineer with the Westinghouse Electric and Manufacturing Company. This man's job was also his hobby. He was always tinkering with machinery at the office and he had rigged up a set at home. Every night he broadcast other amateurs who listened in. Finally his audience got so large and enthusiastic that his friends began to say: "Look here, you aren't an amateur any longer. Why don't you take your instrument over to Westinghouse and start a regular broadcasting station?"

That was the foundation of KDKA.

H. P. Davis, vice president of the Westinghouse at Pittsburgh, saw in this humble experiment the vision of a great public service. He recognized the opportunity for the multiplication of the elementary scheme of 1920 into a national program by strengthening the power of KDKA, thus increasing its range.

The problem was: How was a company furnishing such service to receive adequate return for the great investment necessary? Mr. Davis submitted his plans to Gen. Guy Tripp, chairman of the board of directors of the company, and received not only encouragement but official authority to proceed with the development.

KDKA, since then, has expanded under General Tripp's guidance and has blazed the trail in many directions, including present-day experiments in short-wave radio-relay transmission and the use of higher power from transmitting stations.

Wireless a Decade Ago

The broadcasting of election returns was an exciting success, as judged by the standards of those days. In preparation for the event the Westinghouse Company had sold a limited number of simplified receiving devices. These were little more than wet batteries attached to telephone head sets. A few hundred homes were equipped and neighbors crowded in to take turns listening to the device. Some refused to believe their own ears and were fairly struck of a heap when newspapers confirmed the tidings brought by the head phones.

I recall a number of instances of the more or less personal type of broadcasting; that is, of an individual making an effort to reach a certain other individual or group. I was part of one such attempt on May 13, 1914. I left New York that day on the steamship Antilles, on my way to New Orleans to attend a meeting of the association of railway telegraph superintendents which opened May nineteenth.

At that time I was contract manager for the Marconi Company. We had been testing various forms of the hydrogen-arc radiotelephone transmitter in the Marconi shops and at the Wanamaker station, and as the Antilles sailed along we tuned in on the Wanamaker station and got quite clearly from my colleagues a program of phonograph music. This afforded great amusement to our party and gave rise to speculation that occupied us during nearly all the rest of the trip. We disagreed violently. Several said that the radio had gone as far as was possible. Others, more sanguine, predicted part of what has come to pass today.

An amateur who was broadcasting in 1915 was Alfred N. Goldsmith, then of the faculty of the College of the City of New York, now chief broadcasting engineer with the Radio Corporation of America. He was using a telephone transmitter to reach a man in Grand Forks, North Dakota, and every evening when he began to broadcast he called the roll of the states, explaining that he hoped to be heard in all of them. He followed the roll call with phonograph selections and got responses by letter and telegraph from almost every state. Goldsmith often broadcast from his home in lower New York, controlling the transmitter up at City College by a wire line. That was very advanced for the time.

These instances of early personal broadcasting are not related because they were remarkable, but rather because they were typical of what was going on all over the country.

So impressed was I with the work of the amateurs and the interest it was arousing everywhere that in 1915, as assistant traffic

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manager of the Marconi Company, I submitted a report urging the company to confine itself no longer to the ocean. Waxing prophetic, I visioned a radio music box arranged for several different wave lengths which should be changeable with the throwing of a single switch or the pressing of a single button.

I have that report before me now, for I was so sure its predictions would some day be fulfilled that I kept it in spite of unencouraging comment. I was writing, remember, not as an inventor, for I have never been that, but as an engineer and business man who could not help seeing the trend of the times.

I said: "The radio music box could be supplied with amplifying tubes and a loud-speaking telephone, all of which could be neatly mounted in one box. The box could be placed upon a table in the parlor or living room, the switch set accordingly and the transmitted music received."

I explained that there should be no difficulty in receiving music perfectly when transmitted within a radius of twenty-five to fifty miles.

"Within such a radius there reside hundreds of thousands of families," I wrote excitedly; "and as all could simultaneously receive from a single transmitter, there would be no question of obtaining sufficiently loud signals to make the performance enjoyable. The power of the transmitter could be made five kilowatts if necessary, to cover even a short radius of twenty-five to fifty miles, thereby giving extra-loud signals in the home, if desired. The use of head telephones would be obviated by this method. The development of small loop antennæ to go with each radio music box would likewise solve the antenna problem.

"The same principle could be extended to numerous other fields—as, for example, receiving lectures at home which can be made perfectly audible. Also events of national importance could be simultaneously announced and received.

"Baseball scores could be transmitted in the air by the use of one set installed at the Polo Grounds. The same would be true of other cities. This proposition would be especially interesting to farmers and others living in outlying districts removed from cities. By the purchase of a radio music box they could enjoy concerts, lectures, recitals which might be going on in the nearest city within their radius."

When Radio Went to War

The position of the Marconi Company at that time, as to research facilities, capital and patents, would not permit the carrying out of such a scheme. Furthermore, it seemed a radical departure from anything that had ever been done, and there were many objections from every source as to the technical and commercial nonfeasibility. I had to wait six years to see my dream developed.

As we have seen, radio, in its industrial beginnings, followed the call of the sea. In all ages the sea had been the mystery which man had tried in vain to solve. Beyond its dim edges lay land, peoples and continents strange to early humanity. Even the modern, when he took passage aboard an ocean liner, steamed away into silence until reported from shore days or weeks later.

By 1915, to supplement the shore-to-ship stations, a number of high-powered stations had been built in the United States for transoceanic telegraphy. Only here, unfortunately, the industry had grown in advance of the art. The key to constant reliable transoceanic service had not yet been found by those who controlled the basic radio patents.

That is, existing equipment did not generate sufficient power in suitable form to transmit radio messages continuously across the Atlantic. Industry recognized the situation, and in Schenectady, New York, for ten years the General Electric Company had been working upon the task of designing and building a high-speed, continuous-wave, alternating-current machine which might be used instead of a spark apparatus to transmit signals across the breadth of the ocean.

At last the experiments succeeded. Representatives of the Marconi Company of England hurried to this country to negotiate for the sole and exclusive rights of the Alexanderson alternator.

In the midst of their parleying came the war. Then, that no foreign country might be permitted to control its communications with the air, the United States Government took over the high-powered stations of the Marconi Company of America. I was thrown in with the other liabilities and assets. And so I was privileged to witness the rebirth of radio and the actual preliminaries to broadcasting. Under the stress of a national need, commercial laboratories and individuals poured out their best to the Government. And the Government took what it would, as it must, in the stress of a national emergency.

Retaining American Leadership

The General Electric Company temporarily discontinued negotiations for the sale of the Alexanderson alternator and placed its entire development at the service of the nation. The alternator was installed at the government-operated wireless station at New Brunswick, New Jersey, and remodeled the entire system of wireless transmission. As a result, for the first time continuous and practically uninterrupted communication was made possible through the air with other nations. A later report of the Federal Trade Commission, issued by the Government, called the New Brunswick station the first on the Atlantic Coast which transmitted radio messages continuously and reliably.

Suddenly, thrilled by the knowledge that it could no longer happen, every thinking American awoke to the fact that up to this time the cutting of a cable might nearly have isolated an entire nation. Radio telegraphy took on new significance and became a subject of research and experiment in the great workshop of the Government. One brick was laid upon another so rapidly that an entirely new structure sprang up in a few months.

And then came peace and a problem: Should radio be demobilized? Should the United States relinquish the leadership of the air which American inventive genius, industrial vision and capital had made possible? Should our transoceanic communications by radio pass again under alien control? The patent fight was due to begin all over again. The vacuum tube, an outgrowth of the Fleming tube, was the heart of radio and the heart of litigation as well. The basic patent was owned and controlled by the Marconi Company of America, but many improvements had been added by others, notably Lee De Forest, to the original device. Patents for these were in different hands and the conflicting groups were each refusing to cross-license the other. It looked as if the industry would come to a standstill, because no one person or group of persons held enough patents to go ahead.

Finally, on April 5, 1919, a small group of men came together at the call of Rear Admiral W. H. G. Bullard, of the United States Navy, the Government's senior representative in control of United States radio during the war, and Lieutenant Commander S. C. Hooper, then, as now, head of the radio division in the Bureau of Steam Engineering of the United States Navy. Admiral Bullard and Commander Hooper knew that the General Electric Company was about to conclude negotiations with the Marconi Company of England for the use of the Alexanderson alternator. They thought the situation critical for American interests.

Admiral Bullard pointed out the "dangers that would ensue if the control of the Alexanderson machine should be sold to any foreign government or foreign private companies," and predicted that to turn a system

such as was embodied in the New Brunswick station over to the control of foreign interests would be to renounce American leadership in radio. He called it the patriotic duty of American industry to establish a wholly American company to meet the competition of other radio interests in the world.

Reporting his remarks later to the United States Naval Institute, Admiral Bullard said: "I pointed out that our citizens had never played any prominent part in cable communication and that here was a chance to retain in American hands the complete domination of radio communication in the United States, as well as Central and South America. I made reference to a policy of wireless doctrine, similar to the greater Monroe Doctrine, by which the control of radio on this continent would remain in American hands.

"The chairman finally announced that as the matter had been presented to them, it would be a most unpatriotic action to proceed with negotiations with the English company, and so far as the directors then present could do so, they would proceed no further in the contemplated sale of the Alexanderson machine."

In this manner was formed the Radio Corporation of America, with Owen D. Young, chairman of the board of directors, and Edward J. Nally, president. Mr. Young, then vice president of the General Electric Company, now chairman of that company, as well as of the Radio Corporation, saw the value of a move which not only would prevent the control of an important machine from falling into alien hands but would afford an opportunity for building around this nucleus a system of radio communication which would take over the patents and going business in this country of a company controlled from abroad, and at the same time give the American public a competitive method of international communication independent of the accidents of war or peace.

There followed then mobilization of the necessary patents, and the threatened paralysis was averted, but not before the situation had finally impelled the United States Navy Department to write to the interests concerned, appealing for an agreement between the holders of basic patents whereby the public could be freely supplied with vacuum tubes and other radio necessities.

Talking to the Whole World

After its formation, the Radio Corporation began to build a radio central on the north shore of Long Island—a superpower radio system that simultaneously could send messages to and receive them from the great nations of the world. This giant of radio, with its steel towers covering more than ten square miles of land, was opened on November 5, 1921, by President Harding. The President's accompanying message was received simultaneously and directly in twenty-eight countries of the world. It read:

"To be able to transmit a message by radio in expectation that it may reach every radio station in the world is so marvelous a scientific and technical achievement as to justify special recognition. It affords peculiar gratification that such a message, from the chief executive of the United States of America, may be received in every land, from every sky, by peoples with whom our nation is at peace and amity. That this happy situation may ever continue and that the peace which blesses our own land may presently become the fortune of all lands and peoples is the earnest hope of the American nation."

While these stirring events were taking place, I, with all the others who believed in the future of radio, was hard at work. During 1919–20, I was commercial manager of the Radio Corporation, the same position I had held in the Marconi Company. Then on April 29, 1921, I became general manager.

The time was near when radio was to take a definite place in American life, and the men were not wanting who could accomplish this task. Mr. Young was a farmer's boy, born at Vanhornesville, in the state of New York; and Mr. Nally, the first president of the Radio Corporation, had started his career in the communications world as a messenger boy of ten.

It was Mr. Nally, with his experience in communications, who carried out in practical detail Mr. Young's vision of a world-wide system of American radio communication.

He gave me my first opportunity to assist in this program of development and to find my life work. In his kindly way he tempered the ambition of youth by his mature experience.

Gen. J. G. Harbord, who succeeded Mr. Nally, came to the Radio Corporation at a sacrifice to a brilliant career in the United States Army.

The radio art and industry faced virgin problems of production, organization and service, and General Harbord could offer the highest ideals of public duty and a genius for organization. The measure of his success is best gauged by the present position of radio, both as an art and as an industry.

How Radio Works

At this point, by special request, as the broadcast announcers put it, I am going to try to tell in a nontechnical way how radio works. I find it difficult, however, to deal with this subject on a strictly nontechnical basis.

Broadly speaking, radio broadcasting, or radio-telegraph communication, is carried on by an electric-wave motion which, although invisible to the eye, has many analogies in our daily life. Thus, a stone dropped into a pool of water creates a wave motion which travels outward from the point where the stone is dropped. Your cook strikes or vibrates a bell to call you to dinner and the transfer of this signal takes place by sound waves made up of varying degrees of air pressure. These are translated by the human ear into what we call audible sound. Your janitor kindles a fire in the furnace and the energy released by the fuel generates heat waves which are responded to by the nerves of the human body.

The electric waves used in radio communication are projected into space by a group of wires suspended vertically or horizontally which are commonly called an aerial. These electric waves are set into motion by vibratory electric currents, which are made to surge back and forth in the aerial by the radio transmitter.

By the proper form of control apparatus these waves may be radiated outward from the transmitting station in the form of the dots and dashes of the telegraph code, or they may be made to rise and fall in strength by the sound waves created by the human voice or by musical instruments. Thus, in radio broadcasting sound waves are generated by the human voice or by music. These are picked up by a device termed the microphone, which, in turn, causes the strength of the electric wave radiated by the aerial to conform with the variations of the sound waves created in the studio by the artists and musicians. The electric waves now travel outward in all directions at the speed of light—186,000 miles a second—and continue in their passage until they strike the aerial attached to the receiving set, in which they produce very feeble currents having the precise characteristics of the sound waves impressed upon the microphone.

So far, the currents in the receiving apparatus are still electrical. They are so weak, however, that they require amplification. This is accomplished by the use of one or more amplifying tubes, which increase their strength to the point where they will cause the detector to function.

The detector is the device which eventually converts these electrical currents into audible sounds; that is, changes them into

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a form where they have the characteristics of the sound waves impressed upon the microphone at the transmitting station. These sound currents are further amplified, and finally directed into the loud speaker, from which they emerge in the form of audible sound or music.

One hears much in radio conversation of the term "frequency," but it is simply another way of denoting the number of waves generated in a second of time. Radio has two kinds of frequencies: First, voice, or audio, frequencies, which lie in the range of 16 to 10,000 vibrations a second; and radio frequencies, which vibrate at the rate of 10,000 to 300,000,000 times a second.

The waves which are projected into space by the aerial at the transmitting station are radio frequencies; that is, they vibrate more than 10,000 times a second. The sound waves which are picked up in the broadcast studio and impressed upon the transmitting apparatus by the microphone are voice, or audio, waves, which really represent the notes of the musical scale or the inflections of the voice.

Now in order to receive messages by radio the station of the receiver must be tuned to the station of the sender; that is, the wave length of the receiving apparatus must be adjusted so as to be identical with that of the transmitting station. This involves the process of tuning, and to this end receiving apparatus is invariably fitted with control devices by which the receiving set is tuned to the frequency or the wave length of the transmitter.

We are often asked what we mean by "wave length." In the case of an ocean wave, the meaning of the term is easily understood; for obviously the length of the wave is the distance from the crest of one wave to the crest of the next, or from the hollow of one wave to the hollow of the next. Radio waves, although invisible, also have definite lengths, the length varying with the frequency of vibration. Thus, if we crowd 1,000,000 radio waves into a second of time, it is clear that the distance from the crest of one wave to the crest of another will be relatively short, and actually about 1000 feet. If, on the other hand, we project but 20,000 waves into space in a second of time, the distance from crest to crest will be correspondingly greater, or 50,000 feet. Described in another way, high frequencies in radio motion mean short waves and low frequencies refer to long waves. Broadcasting is carried on at wave lengths from 200 to 550 meters. The frequencies used, therefore, vary from 1,500,000 a second to approximately 550,000 a second.

Who Invented the Radio?

Every now and then somebody wants to know: "Who invented the radio anyway?" The popular idea about any invention is that it must have sprung full-fledged from the brain of some exceptionally clever person. That, of course, is not true; particularly of radio.

I am only a layman myself in the scientific laboratories and can realize how difficult it is for the inventor and the person for whom he invents—that is, you, me and everybody who owns a radio set—to become really well acquainted. Science has its own language—a language usually far too complicated for the rest of us. The result is that radio owners, as a whole, know very little about how the radios they have in their front parlors got that way. Yet the development of radio is as full of romance as the fact of its existence.

We must remember that most of the improvements in radio, or in any other device of the kind, go on, after a certain point, in the great commercial laboratories as part of a daily routine. Bit by bit, new discoveries are made, new refinements added and old principles discarded.

Often, no one person is responsible for these improvements and so it is not quite

Another thing to be remembered is that there are long, expensive steps between the laboratory demonstration of a phenomenon and its appearance on a shop shelf ready to be sold to you.

The history of radio can be adorned indefinitely with tales of the battered hopes of eager inventors. H. G. Wells wrote of a fight in the air. The past ten years have been a continual battle over the air—a struggle for patents among inventors and for air supremacy among nations. The end is not yet in sight. Every now and again some judge makes a new decision and every month or so a fresh suit is filed.

Leaving it to His Subconscious

It is easy to see why this is the case. The process of invention is one of inspiration on the basis of the path which progress is taking. I have never been an inventor, but I have known a good many and I have always been interested in watching the processes of their minds.

Except on the stage or in a novel, it seldom happens that an invention pops full-grown into some genius mind, large as life and only waiting for the proper tools to put it into immediate operation. In other days, before there were so many in the field, it is true that it was possible to credit individuals with certain inventions; such as, say, Whitney with the cotton gin.

At the same time, even these inventions could hardly be said to have sprung full-grown from the brains of their inventors. They were pieced together patiently, almost painfully, throughout years of hard study and thought.

Sometimes, though not so often as romantic writers would have us believe, a man starts out with the definite idea of making one thing, only to end up by getting a result which, though it may be important, is still not at all what he intended it to be.

As a rule, invention comes about—at least modern invention—something like this: The field in which a scientist is interested calls for some specific improvement. He decides to try to work out the problem, or else is assigned to the task. Perhaps a number of persons in his laboratory are set to help him. He experiments along the line laid out, reads everything he can find on the subject, and finally, having gorged himself with his theme, goes about something else for a while, or perhaps even takes a rest cure so that his inventive powers may have a chance to work during a period of incubation.

This leaves everything up to his subconscious mind. Sometimes the subconscious mind is stubborn and refuses to function. Again, it may solve the problem promptly. Obviously, three or four persons working in this way might get the same results almost at the same time. Who is to say which of these has the best right to it? Naturally the law decides that the man who first makes the invention is the true inventor, even if he is only a few days ahead of the others. Then the second, third and fourth men come along, and of course it seems unbelievable to them that somebody has beat them to what they regarded as their very own brain child. Each wants a patent, too, and tries to show a priority claim. And so patent interferences, suits and countersuits begin.

Interestingly enough, since broadcasting officially started in 1920, there have been almost no radio inventions of a revolutionary character. When the war ended, practically all the important inventions for transmitting and receiving messages were in existence. They had only to be refined and adapted and placed in the proper combinations. This had to be done by trained engineers, as the needs of the public were gauged. Early crudities were due more to lack of knowledge of what was necessary in the way of adaptation than to any grave deficiencies in the fundamental principles of the existing inventions.

CELEBRATE ANNIVERSARY

Pioneer leaders in the radio field recently celebrated the eighth anniversary of broadcasting from KDKA studio. In the photograph, left to right, are: F. A. Merrick, Rev. Edwin J. van Etten; O. S. Schairer; L. C. Thomas; G. Dare Fleck; J. C. McQuiston, program pioneer; H. W. Arlin, announcer; C. W. Chubb; Arthur E. Braun, former newspaper publisher; H. P. Davis, termed the "Father of Radio Broadcasting"; Eugene Connelly, theatrical broadcasting; S. M. Kintner; Harvey Gaul, musical director; C. W. Horn; C. S. Bayard; John Frazier; Dr. Frank Conrad, pioneer in radio development; Chancellor John G. Bowman, University of Pittsburgh.

(Photo by Trinity Court)

Engineer's Watch Has Part In Birth of Broadcasting

PITTSBURG, Feb. 8 (AP) — The pride of an eager young engineer in the cheap watch he owned in 1912, figured largely in the birth of radio broadcasting. The owner is known now as Dr. Frank Conrad, assistant chief engineer of the Westinghouse Electric and Manufacturing Co., and recent recipient of the Edison medal of the American Institute of Electrical Engineers for his achievements.

It was his work that led to the establishment of KDKA here in 1920, as the first broadcasting station operating on a scheduled program. Since then he has seen broadcasting become the giant of the radio industry, advancing so rapidly that he sees synchronization—placing stations carrying the same program on the same wavelength—and television becoming virtually "talking movies by radio," as important developments in the future. And at that, he thinks it will take years of experimenting before television is an accepted, everyday mode of entertainment.

Led to Tests

Conrad, the young engineer rapidly making a name though without college training upon which to build, had no thought of broadcasting one lunch hour in 1912 when he pitted the watch of his pride against the more expensive timepiece of an associate in a contest to determine which kept most accurate time. Yet the contest led him to master the radio devices of the day so he could check his watch against Arlington's time signals. Picking up those signals created an interest in radio in general. That interest resulted in his setting up his own station. Experimentally playing phonograph records over the air brought demands for more and more from the possessors of the crude receivers of the day. Interest thus created about Pittsburg led one store to advertise apparatus with which to pick up Conrad's programs. That attracted H. P. Davis, of Westinghouse, to the commercial possibilities of broadcasting. KDKA was established, and thus broadcasting began.

Solving Problems

Today, Dr. Conrad is solving some of the last problems associated with synchronization of radio stations to make room on the air for others. The problems are not simple. Synchronization involves the setting of the wave length of all stations on the chain from one control point, overcoming the complexities introduced by time and distance so all stations will be in step. Synchronization will be commonplace soon, though, he believes. It was his work on that problem that did much in bringing him the Edison award.

Television is a different matter. Looking upon the pictures now received as relatively crude, he thinks their quality must be improved until it at least equals that of a good newspaper picture before television will be accepted as more than a novelty.

Mr. Sawin, a native of Cambridge, Massachusetts, graduated from Harvard University in 1901, following which he entered the employ of the General Electric Company. For the next seven years, he was engaged in meter engineering, and left in 1908 to become service engineer, for the Public Service Electric Company of New Jersey. He remained with this company for twelve years, leaving in 1920, when he was engaged as Assistant to Manager of the Westinghouse Supply Sales Department, a position he has held until this last appointment.

G. A. Sawin

Today's the Day

Today's the day; so don't delay
And shift it tomorrow!
For if you stall or shirk at all
'Twill only bring you sorrow!

Now is the hour to use your power!
Tomorrow's never here!
If you are wise, you'll utilize
The minutes that are near!

Though it may seem quite fine to dream
And while the time away!
The only wight who gains the height
Is he who does today!

Thus you must do if ever you
Would reach your destination;
With lusty knock step in and sock—
Old Kid Procrastination!

Selling More Rectigon Installations to the Power Companies

J. B. BAUGHMAN, South Bend

IT is a mistaken idea that rectigon battery chargers find application only for charging radio and automobile batteries, as there are many other applications in the industrial and central station field.

In the February 13, 1926 issue of the Electrical World, Mr. Benham of the Great Western Power Company, California, has written a very interesting article on their installation of vacuum tube rectifiers for charging batteries in unattended automatic stations. Our Company has sold several similar installations, but the application is so new and is proving so satisfactory that our salesmen should be thoroughly conversant with this application.

For those who can not obtain a copy of the above magazine we are quoting Mr. Benham's article in full:

"The difficulties of storage battery and charging equipment maintenance when motor generator-charging arrangements are used impelled the Great Western Power Company to consideration of other devices for charging the 60-cell control batteries in a number of unattended automatic stations on its system. The characteristics of garage-type vacuum tube rectifiers appeared to be very satisfactory, but such sets are manufactured for a maximum of only 75 volts on the direct-current output. However, it was thought that two of these rectifiers could be operated in series by using the 220 volt type, which has a double transformer winding, rather than the 110-volt type with its auto-transformer, and such proved to be the case.

"It is necessary to maintain a load of from one to two amperes on the standard six-ampere vacuum tube charger in order to secure a stable voltage on the direct-current output, both for continuous operation and re-establishment after a failure of the alternating-current supply. With this one limitation, which is overcome by adding one or two larger lamps to the normal switchboard pilot lamp load, it has been possible to operate the battery for several months without any adjustment.

"Discharges occasioned by the normal functioning of the station control apparatus are returned by the charger at a somewhat slower rate, but eventually the balance is re-established at exactly the predetermined operating voltage. The usual slight variations in alternating-current voltage apparently have no effect. The connections of the two chargers are shown in the accompanying diagram.

"The original cost of such a unit is about on a par with a motor-generator set, but the maintenance is practically nothing, as the tubes have a life of several thousand hours at the low charging rate that was used.

"However, the very superior operating characteristics, resulting in a much longer battery life, would justify the installation even at a greater cost."

J. W. Lewis Goes to California

J. Walters Lewis, Office Manager of the Railway Department, has been appointed Southern California representative of the Westinghouse Acceptance Corporation and will assume his new duties with headquarters in Los Angeles about April 1.

Mr. Lewis is now in his twenty-seventh year with the Westinghouse Company, he first being employed in the Mailing Department, February, 1899. In the years following his employment, Mr. Lewis rose gradually in rank, holding positions in the executive department, Sales Manager's Office, and the Supply Department (then known as Department D).

In 1910, he left the Company to become Secretary, Treasurer and a Director of The White Investing Company and subsidiary companies of New York. He remained away a year and a half, returning to the Company in August, 1911. He was next assigned to the Syracuse office as a general salesman and after three years there was transferred to the Detail and Supply Department at East Pittsburgh. In 1914, he was selected to organize and take charge of the Cost Division of the D & S Department, and in 1916 these duties were increased to include price work on Supply Department orders. In 1918, he was appointed Chairman of all Supply Department Standing Committees on apparatus development, in addition to his appointment as Manager of the Order and Cost Section of the same Department.

In 1921, he was made Assistant Manager of the Development and Supply Division of the Railway Department.

J. W. Lewis

In 1922, he was appointed Office Manager of the Railway Department and held that position until his present appointment.

Mr. Lewis, in going to California, returns to a land where he spent a part of his youth. Although born in the "Smoky City", Mr. Lewis was taken by his parents to California when eight years old. He attended public schools there at San Bernardino, Los Angeles and Pasadena.

Later he returned to Pittsburgh with his parents and continued his education in this district.

Let KDKA Vouch for You

W. W. Rodgers,
Department of Publicity

ONE would rather meet an old friend than a new acquaintance. With the first, there are many things to chat about concerning this experience or that event which has been shared in common. With the second, conversation may lag because a common bond of experience is usually lacking, and often a subject of mutual interest is hard to find.

A salesman endeavors first of all to interest his prospect. In what better way can this be done than to start the conversation in channels in which each has some interest or knowledge?

An illustration of the benefits of this elementary psychology of salesmanship is furnished by a Westinghouse dealer engaged in selling our farm light equipment in a Rocky Mountain district of the Far West, who capitalizes the invention and the development which, to the public, are synonymous with Westinghouse, namely, the airbrake and radio broadcasting.

The dealer, whose policy we mention, calls on men far removed from the ordinary haunts of what is erroneously t e r m e d civilization. His prospects are inherently suspicious of strangers and are accustomed to deal plainly with facts. Although they live in the Rockies, these ranchers are "from Missouri" and require the salesman to "show them". These conditions require that a salesman must first win the confidence of his prospects and then sell them on the application of the equipment to their specific needs.

This dealer's success in gaining the friendship of his prospects largely depends upon his first statement, for after introducing himself as a Westinghouse representative, he immediately follows with the remark that "of course Westinghouse is well-known, as it is the Company that invented the airbrake and established KDKA, world's pioneer broadcasting station".

The rancher knows that airbrakes made the modern trains possible, he is usually familiar with their history and he hears our programs nearly every night.

It has been the experience of this Western dealer that the response to this form of approach has always been immediately favorable and that from then on he has never had difficulty in winning the confidence of the customer.

This dealer is capitalizing the public's interest and confidence in KDKA. He, by giving the information that he is connected with the broadcasting company, is immediately accepted in the same spirit with which the broadcasting station's programs are welcomed in the home.

All our salesmen should remember to capitalize the good-will of the public obtained through its constant contact with Westinghouse broadcasting stations, these being not only KDKA, operated from the East Pittsburgh Works, but also KYW at Chicago; WBZ at Springfield, Massachusetts, and KFKX at Hastings, Nebraska.

Many prospects for Westinghouse apparatus belong to that class termed "radio fans". Such "fans" are willing talkers on all subjects pertaining to r a d i o. M e n t i o n radio to them and very likely the salesman, will spend the next hour listening to their experience concerning the operations of their radio sets and will be expected to give some information in return.

Nearly every owner of a radio receive belongs to the "fan" class, having the "disease" in a form which may vary from mildness to acuteness.

The radio stations operated by the Westinghouse Company are their most constant contacts with the public, and are today, according to public reckoning probably the outstanding achievement of the Company. These stations are unceasing in their efforts to build up of good-will in the public mind.

The salesman who is not capitalizing this good-will, who is not using it to advantage, is not utilizing all the tools at his command in promoting his work. He is not making the most effective contact.

Consider the record of Westinghouse broadcasting. KDKA was the first station established as a broadcaster in the world; it was the first to broadcast every modern program feature, except the transmitting of operatic programs, and these were first sent by its sister station, KYW in Chicago. Westinghouse pioneered in short wave development KDKA now holding the record for first transmitting the ultimate in distance because of its many transmissions with Australia halfway around the world. Westinghouse also pioneered in the repeating by radio of programs, having established such a system; first, at KFKX, and later, at KYW and WBZ; all these stations now being equipped with short wave apparatus to enable them to rebroadcast a program originating at East Pittsburgh.

KDKA'S programs have been heard on every continent in the world. It is a f a m i l i a r and an old friend to radio listeners in the British Isles, in Europe, in South Africa, in South America and finally in Asia, notably Japan.

The records established by the stations of the Company, both in program origination and transmitting, have never been equalled by any organization. It is, therefore, inevitable that the public should recognize this merit and react favorably when Westinghouse Broadcasting is mentioned.

No other agency has yet been developed which has so permanently established itself in the homes of the public, as has broadcasting. No method of communication has been developed which so effectively becomes a part of the daily life of the listener.

The statements made in the preceding paragraph are platitudes which have been publicized for some years and which still are impressive.

Westinghouse leadership in broadcasting provides an opportunity for the salesmen to so identify himself as to be a welcome visitor to his customer's office. Make KDKA serve as an advance agent.

December 1930

Signing Off on the First Ten Years

Broadcasting takes stock—and a look ahead

By GEORGE W. GRAY

FROM a feeble wireless telegraph service in 1920 radio has grown in ten swift years to the billion-dollar industry it is to-day—surely something new under the sun!

At the beginning of 1920 radio was merely a device for sending messages without wires—a means of communicating between ship and shore, and thereby dramatized as the savior of many a shipwreck—an incorporated public service offering transatlantic wireless communication at so many cents per word. Strange magic, of course, but still just another electric way to send a message.

To-day wireless telegraph service is more extensive and more widely used than ever before, but who thinks of it when he thinks of radio? Most of us think of WJZ, or of some other cryptic combination of letters. We recall the garrulous antics of Amos 'n' Andy, the pious anecdotes of Seth Parker, the inanities of the Nit-Wits, Dr. Cadman's booming voice. Radio means King George's speech coming over from London in the early morning, it means overhearing Adolph Ochs in Schenectady chat with Rear Admiral Byrd in New Zealand; it means Graham McNamee, Roxy, Floyd Gibbons, Lowell Thomas, the barrage of vocal advertising. It means, in one word, broadcasting.

Floyd Gibbons telling the story of the Graf Zeppelin's arrival at Lakehurst, N. J. A portable set allows the broadcaster to be at the scene of his event.

It's a modern postwar baby, this broadcasting industry. When the boys of the A. E. F. came trooping home from overseas the movie had set up its flickering screen in every crossroads village and the airplane was already carrying the mail on regular schedule, but there was no broadcasting. The radio world consisted of the wireless telegraph stations, a few experimental laboratories, and some thousands of eager amateurs scattered over the globe.

One of these amateurs, whose station had grown from a small homemade receiving set into a full-fledged experimental laboratory, was Frank Conrad. He lived in a Pittsburgh suburb, and his station occupied the upper room over his backyard garage.

Doctor Conrad of the Westinghouse Electric & Manufacturing Company is an eminent engineer and inventor, but I list him here among the amateurs because he entered the wireless field as an amateur. Indeed, he told me he set up his first radio apparatus in 1913 in order to get Naval Observatory time signals and thus keep tabs on the accuracy of a new watch; but he was soon led into the fascinating realm of radio experimenting. By 1915 he had applied to the government for a license, struggled through the requirements until he could receive ten words a minute in Morse code, and obtained a license for experimental station 8XK.

When the United States entered the war in 1917 all amateur licenses were suspended. But because of the work his company was doing for the government, the Navy authorities decided that Conrad's station might continue, relicensed as 3WE. It became an important center of radio research. Day and night the work went forward here and at the station established at the Westinghouse plant five miles away. Conrad's studies were focused mainly on problems of the Army Signal Corps. And especially did he work toward the perfecting of radio telephony.

After the war this backyard laboratory became one of the most powerful amateur stations in the country. Conrad had rigged up a phone transmitter—not many amateurs had that—and it became an exciting game to launch his voice into space and see how far it would carry. Even more exciting was the thrill that came to the distant listener when he picked that voice out of the air. Here was a message that he did not have to decode; anyone could understand it. In many an amateur's home there was the excited calling of members of the family: "Listen. You'll hear a man talking."

The man talked twice a week, Wednesday and Saturday nights. He played phonograph records before the microphone. His high-school sons enlisted a quartet of singers from among their classmates,

and these became a regular feature. Between musical selections were announcements of news, baseball scores, and other gleanings from the evening paper. In dozens of homes people began to write letters to their far-away entertainer, thanking him, offering suggestions. Could he play the Spring Song next Saturday? Would the boys please sing I Love You Truly?

"Gradually the thing grew," related Dr. Conrad. "One of the boys I appointed announcer. Another boy was the son of a phonograph dealer. As new records were issued he would borrow them, and in broadcasting these selections we would announce that they were provided through the courtesy of the Brunswick Shop. I suppose that was the first radio advertising."

Something for Nothing at Last!

Many times before this the human voice had been vibrated into space on radio waves. As early as 1906 Reginald A. Fessenden transmitted a musical program. But these occasional performances were in the nature of scientific tests or demonstrations. Conrad's performances were unique in that they were offered as a regular scheduled service for the entertainment of the public.

There were some who smiled at the naïvety of this twice-a-week free entertainment. What was the object? How long could he keep it up? Something for nothing was strange business. But these after-hours activities of their engineer were followed with the keenest interest by executives of the Westinghouse company—and especially by vice-president Harry P. Davis.

Davis had been in close touch with Conrad's radio research from the beginning. "But it was more than a merely personal interest and curiosity," says Mr. Davis. "Our company had just bought the International Radio Telegraph Company in order to get control of certain patents. It made this purchase on my recommendation, paying $2,500,000—which loomed as big in 1920 as $20,000,000 does to-day—and now the problem was how to turn this new property to profitable account. And since I was responsible for the purchase, I felt responsible for making it pay.

"One Sunday morning, in October of 1920, I picked up a Pittsburgh newspaper, and my eye chanced to fall on an advertisement. A department store was featuring certain wares, and an item down in one corner caught my attention." It read:

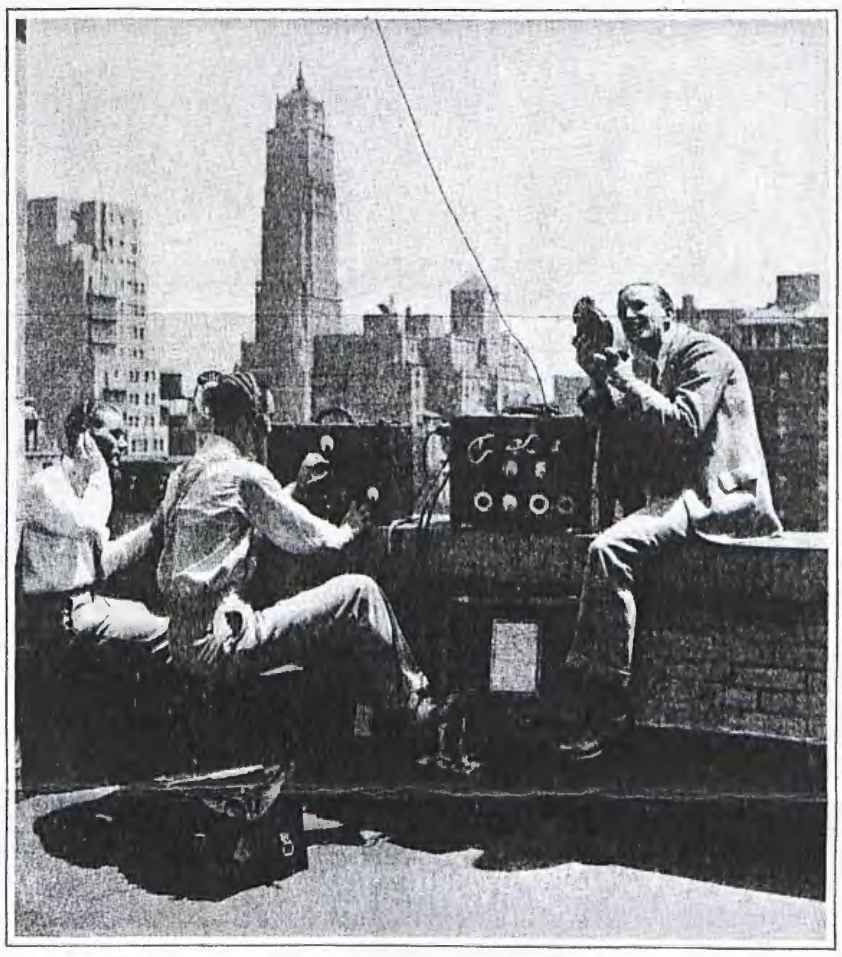
> A special line of radio receiving sets suitable for listening to Dr. Conrad's concerts.

"The instant I read that paragraph my mind clicked," went on Mr. Davis. "If a retail store saw enough in radio to set up a department to sell goods on the strength of this twice-a-week entertainment, then there must be something in it for a radio manufacturer. Suppose the entertainment were provided daily? Suppose it were broadcast on greater power? Suppose a variety of features were provided? Would not great numbers of people become interested, and buy radio sets in order to listen? If so, here was the solution of our problem. We could manufacture for the multitude instead of for the few wireless telegraph stations."

Next morning Davis sent for Conrad. "Frank, we want you to close down that radio station of yours." Conrad was plainly surprised. "Because," explained the vice-president, "I have an idea that the company ought to get into this broadcasting business." He outlined his plan, and Conrad fell in with the idea at once.

It was decided to launch the new station on the night of November second by broadcasting the election returns. Cox and Harding were contending for the Presidency, and this provided the big national event that was wanted to attract attention to the broadcast. But it made hectic work for Mr. Davis and his associates; for the election was only two weeks off.

Meanwhile, down in Washington, government officials were rather flabbergasted by this strange



The short-wave set-up used in recent tests of broadcasting to a plane overhead. Curt Peterson, on the roof of the National Broadcasting Company's building in New York, communicating with a plane above the city.

request for a "broadcasting license." There was no such animal. Finally the Department of Commerce decided that this broadcasting project was something of an experiment, so they licensed it as experimental station 8ZZ.

At 8:30 o'clock on election night Station 8ZZ began its historic broadcast on a wave of 330 meters. A telephone line from the news room of the Pittsburgh Post brought the election items to the hastily built studio on top of a factory building. Conrad went home to his backyard station and stood by, in readiness to take up the broadcast in case anything happened to 8ZZ. A telephone connection between the two stations awaited this emergency use, but there was no need for it. The program went over as planned. It was heard as far north as Manchester, N. H., as far south as New Orleans, La.

KDKA, Broadcasting's Pioneer

It was the birth of a new industry. The Radio Division in Washington soon recognized that this new use of wireless was more than an experiment; it granted the first broadcasting license and assigned the call letters KDKA to the Pittsburgh station. For the first ten months of its life KDKA had the radio audience all to itself, and the only interference it knew was that of amateur "sparks."

Competition began in the fall of 1921. Three new stations took to the air in September, one in October, one in November, twenty-three in December. Most of them were small, but each added fuel to a flame that was sweeping the country. Radio shops sprang up in the cities; mail-order stores carried the business into the small towns. The radio craze was on.

By the end of 1922 there were 508 stations broadcasting in the United States. By the fall of 1926 the number had risen to more than seven hundred, and there was pandemonium!

Some stations had deliberately jumped their assignments and appropriated the frequencies of others. Some had increased their transmission power. New stations had popped up demanding time and space in channels already crowded to overflowing. And the law gave the government no power to deny a license nor to regulate a station. On the face of it, one might suppose that no business asset could be of more doubtful value than a broadcasting license; yet, when this chaos was at its height, in November of 1926, the Radio Corporation of America paid the American Telephone & Telegraph Company $1,000,000 for station WEAF and incorporated it as the National Broadcasting Company.

The Government Steps In

It would take many millions to buy WEAF to-day. Under the present law, broadcasting licenses are granted for ninety days only, and confer on their holder no vested rights; yet the goodwill value of some of the large stations is prodigious. The National Broadcasting Company, with 75 transmitters in its hook-up, and the Columbia Broadcasting System, with 72, have demonstrated that radio entertainment may be operated as a nation-wide business. And now plans are drawn for a "city of radio" to be built on three square blocks facing Fifth Avenue, New York, at a cost of $250,000,000—more physical evidence of the importance of radio as a business.

Of course, the basis of its prosperity is the willingness of the invisible audience to listen. In a recent survey of San Francisco, made public by the Federal Radio Commission, 5 per cent of those interviewed said they were "tired of radio" and 53 per cent said they were "annoyed" by radio advertising. Perhaps these reactions are representative; but, in spite of the banalities and the advertising, the American people continue to buy radio apparatus. They paid $850,000,000 for receiving sets and parts in 1929. Last July, when lay-offs and salary cuts were affecting many industries, a radio manufacturer announced that his company was putting on seven thousand workers in addition to its regular force of thirteen thousand.

Two factors contributed to the stabilizing of the industry. First, the Federal regulation of broadcasting—a measure forced by the lawless competition of 1926. Before this, all efforts to place broadcasting under government control had been defeated in Congress, but now many of the suffering broadcasters themselves cried for relief from chaos. The radio law of 1927 was enacted, creating a Federal Radio Commission with power to license and to withhold or withdraw licenses and empowering the Radio Division of the Department of Commerce to police the broadcasters.

Time—A Marketable Commodity

To-day this police function is administered by a staff of more than one hundred inspectors and technicians, working through sixteen district and branch monitor stations scattered over the country. In September of 1930 the effectiveness of the service was greatly enhanced by the opening of the central monitor station. Here—near Grand Island, Nebraska, midway between the two oceans—is installed the most powerful and sensitive detecting apparatus ever assembled. With it the radio police will be able to pick up broadcasts from every American station, to check frequencies, transmitter power, time—all the minutiæ on which a broadcaster must keep within the law.

Radio law is by no means a finished instrument. There are still too many American stations—six hundred in the summer of 1930. But the improvement over conditions four years ago is enormous.

The second factor which has prospered the broadcasting industry is the rise of radio advertising. The purpose of broadcasting ten years ago was frankly to boost the radio business. Eventually the broadcasters discovered that they could also boost the automobile business or the ginger-ale business, and time on the air became a marketable commodity.

For an hour on the "blue network" reaching eleven of the largest cities, an advertiser pays $3,350; for the same time on the "red network" of twenty cities, he pays $4,980; and for a nation-wide hook-up of forty-seven cities, $10,180. The National Broadcasting Company reports for 1929 a gross income of $150,000,000, most of it receipts from advertisers.

Advertising has made broadcasting an industry, but from the ranks of radio (*Continued on Page 86*)

Signing Off

(*Continued from Page 48*)

itself, from no less a personage than Dr. Lee De Forest, comes this frank warning: "The present tendency of the broadcast chain and many individual stations to lower their bars to the greed of direct advertising will rapidly sap the lifeblood and destroy the usefulness of this magnificent new means of contact."

Broadcasting is possible without advertising. In the British Isles and in most of the countries of Europe radio programs carry no paid advertising. "Our American system is better," answered Mr. H. P. Davis, when I brought up this point. "If every owner of a receiving set had to pay an annual license fee of $2.50, as is the rule in England, there would be far fewer sets.

"From the very beginning of broadcasting the question as to who is to pay has been repeatedly raised, and one plan after another has been proposed—and abandoned in favor of the present system. Radio advertising requires a special technique, and objectionable advertising tends to eliminate itself. The individual or firm that can bring the subject of its activities to the listening millions in an adroit and satisfying way is employing a means of great commercial possibilities, and it can justify the expenditure of large sums of money."

No doubt the radio advertiser can justify any expenditure. Amos and Andy receive a salary of $100,000 a year, but the tooth-paste company which is advertised by their foolery has sold ever so many hundreds of thousands of tubes and reports a 300 per cent increase in business. However, there remain some who resent the intrusion of even adroit advertising.

The future of radio entertainment focuses on this question. Television is just around the corner; in another ten years it will be in the home. Will it bring into the home visual announcements of cigarettes and soap, thus adding to the ear appeal of the announcer the eye appeal of the screen?

Perhaps the engineers will contribute. It may be possible to devise a radio filter which one may buy or rent, as one buys a season ticket to the symphony or the opera, and by means of which entertainment may be brought into the homes of those—and only those—who pay for it.

Or it may be that in the future radio stations will be endowed for the entertainment and education of the public, as orchestras and universities are endowed.

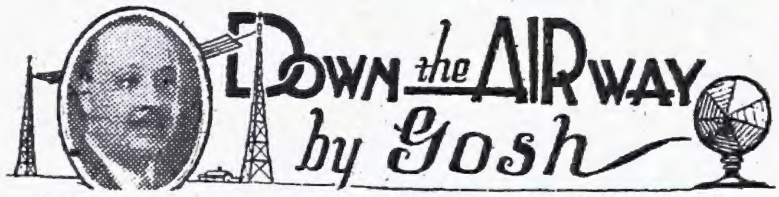
In another ten years the billion-dollar baby will have grown up. Perhaps it will be a very different thing. But it can hardly have any more romantic and exciting history than it experienced in its first ten years.

Mr H P Davis

Asheville, North Carolina, Citizen, September 28, 1927

Radio Programs For Today

WWNC PROGRAM
Wednesday
1 to 2—Battery Park trio. Battery Park hotel.
6:30 to 7—Orchestra from the Eagle
9:35 p.m.—Frey's Orchestra; Studio Program.
11:00 p.m.—Dance Orchestras.
WTAM—Cleveland—750-399.8
6:00 p.m.—Dance Program.
8:00 p.m.—Military Studio Program.



If you like to take your ease early in the evening just after you arrive home from the office and, if you like the soothing strains of a good orchestra—not the jazzy kind—then you should go to your radio about six o'clock and set the dials for KDKA. This pioneer of all stations broadcasts one of the most enjoyable of early-evening concerts every evening about six, and we can promise you you'll enjoy every portion of it, if you tune it in. KDKA is one station that you can always depend upon for a good quality of entertainment—no matter what they choose to broadcast, it always is the very best. These six o'clock concerts usually feature some orchestra that makes a specialty of the semi-classic—as for instance, the number to which we lend an ear while typing this. This number is a selection of Southern melodies, played, as the announcer said "under the general heading of the 'Sunny South.'" "Turkey in the Straw," "Old Kentucky Home"—well you know the kind of music it is. Well played too, and thoroughly enjoyable.

KDKA deserves a place high in the estimation of those who look to radio for worthy entertainment. Never can we point to a time when the programs created in the studios of this station were not good. No shoddy stuff gets through KDKA's microphone. We get the idea that they value their privilege of broadcasting to the masses too highly to permit of anything but that which is good—their programs portray thought and a due regared for the likes of those who do not care to subsist entirely on a diet of seafoam. Yet, for those who like it, there is a seasoning of jazz, a dash of the popular and a whole lot of life. We do not wish you to get the idea that KDKA's programs are monotonous—they are anything but that. But, when we contrast their tenancy of the air with that of some other stations we could mention, well there is a most noticable difference. After hearing one of these "highlifers" agitate the atmosphere for a noisy thirty minutes or so, it is a relief to be able to turn to KDKA, knowing that whatever happens to be on the air at that moment, you'll find it good. We don't believe there is a station anywhere that can show such a variety of broadcast subjects. There are some that can show as many-but we maintain that this Pittsburgh station has earned its place in the front rank. And the thing we like about this station is the fact that it exhibits not the slightest tendency to rest on its laurels. There is as much effort to please, as much of an eagerness to keep the liking of its friends now, as there was 'way back yonder when we considered it quite a feat to be able to tune this station in at all.

Taking Station KDKA as an example is about the best thing that any station can do—and when we consider the antics of such outfits as [redacted], well we are convinced that it is the KDKA type of station that will win out in the end. And that it will be broadcasting serenely long after the others have been patted carefully in the face with a shovel. If these that we have named and others that we could name if we had time, to devote as much time to the sending out of the type of entertainment that KDKA does and if they were to devote as little of their time to the dissemination of useless verbosity as KDKA does, they'd merit some small portion of affection that this pioneer receives in such abundance from those fans who appreciate an honest endeavor to please.

And in devoting that column to KDKA we are but endeavoring to pay tribute to the long service that had made that station such a power in the world of radiocast programs. Almost six years of continuous service. On the air always as per their schedule. Never a breath of scandal. Never the suspicion of their trying to "put anything over" on the radio audience. A well behaved station this, and one for which we will always have a good work. Would that ALL stations were like KDKA!

Lloyd C. Thoma

WHY MUCH RADIO RUINS RADIO PROGRAMS

Announcer Takes Place of Town-Crier and "Glorified Word-Of-Mouth Advertising," Says Davis—He Warns Against Overstressing Commercialism in Programs

By H. P. DAVIS, Vice President Westinghouse Electric and Mfg. Co.

ALTHOUGH radio broadcasting is a young art and the methods of advertising which utilize it as a medium are generally considered new, in reality that method is the oldest known. For advertising by radio is nothing more than glorified word-of-mouth publicity such as was current in earliest times.

I would not say that the present form of advertising on the radio can be compared in quality with any other previous form of vocal dissemination of information regarding products offered for sale. However, the old town-crier who brought news from abroad, told of the fine bullocks for sale, announced meetings and perhaps did a little entertaining on the side, has his modern counterpart in the announcer who, seated before a microphone, can make his voice heard in every corner of the globe.

Probably, therefore, the problem of the relation of advertising to news or amusement in vocal mediums is not so much a new one, but an old one complicated and intensified by a modern development. It is quite possible that the town-crier's audience became somewhat restive when he dwelled too long on the quality of the goods he was advertising when they wanted to get the latest news from the Crusaders in the Holy Land.

Vocal Advertising Languished.

This early means of advertising suffered an eclipse with the decline in illiteracy when the purchasing public learned to read and printed sales talks came into being. With the newspaper it was possible to reach larger groups than with the human voice, so the vocal advertising art languished and disappeared. During that time the newspaper was developing, improving its text and at the same time bettering

on KDKA began
sts, thus institut-
adio as an entertainment fea-
a means was provided for the return of the spoken word as an advertising medium. Perhaps at that time we who were developing radio did not vision the great extent to which advertising would enter into the art. From the earliest days though, the question of "who is to pay" entered into our thoughts. We were confident that if broadcasting were to grow, as we were sure it would, some means would be discovered to pay the bills. I can say that we did not worry about this feature. I was confident from the beginning that this new service would become so necessary to the public that some means would develop to make it pay its way. The advertising value of broadcasting was recognized in the beginning and it was early evident that it would play an important part in the development of radio.

Tax Is Not Favored.

I believe the American way of making broadcasting free to the listeners to be the best. The taxing of receiving sets as practiced in Great Britain and in other countries may be excellent but not one which would meet with favor in America. Our method stimulates program development and has produced a more varied fare of entertainment than has the British system.

Despite the fact that the advertiser is paying, he cannot take undue advantage of that fact. The American public is never so particular as when it is being given something for nothing. It has no feeling of ownership in a radio program and is ready to criticize at any opportunity. In fairness it is necessary to say that its favorites receive praise and adulation that far outbalance the criticism directed at the less favored.

These facts are well recognized by the majority of the sponsors of nationally broadcast programs. Some of the larger advertisers may reach too far in their efforts to secure the most for their investments. Among sponsors of less pretentious programs on single stations there is a tendency among many to overstress the commercial aspect of the program.

The radio advertiser must realize that he is catering to a family group. Through a program he is projecting his organization into the privacy of homes in all parts of the country. He must use tact and discretion in doing this, for the listeners have in good faith tuned their radio to procure entertainment. If they are disappointed and receive a sales talk instead, the advertiser cannot escape the fact that he has lost what he was seeking.

In planning the radio program the first thing to be thought of should be the character of its service. If the program can be popularized, be it entertaining or educational, the mere mention of the sponsor's name is enough to secure the good-will of thousands. Indeed, some programs recognize this very fact. Then some add a short statement regarding the product they wish to bring before their listeners' attention. The shorter, the better in this case, for when the statement becomes long enough definitely to attract the attention of the listener to the fact that he is hearing commercial persuasion, rather than being entertained, he is apt to react unfavorably toward the entire program.

Time will develop the smoothly written continuity which will emphasize the company or the product being advertised in a subtle way. This can be done with such skill that the sponsor is actively presented to the audience every moment during the program.

I believe that national advertisers who have attained the greatest success are those who use a minimum of direct advertising in their programs, but who keep at it everlastingly. Year in and year out presentation of a program indelibly stamps the sponsor and his product upon the consciousness of the listening public. This was forcibly brought to my attention recently when a program which had been a favorite for years changed the style of its presentation. The comment in the press upon this change was widespread and I have no doubt that it was just as current among radio fans. The program had so impressed itself upon the listeners that it was "big" news when its policy was changed.

The radio sponsor should keep the standard of talent and medium of transmission of his program high. The national radio chains have maintained a generally high quality of program, day in and day out. It is their business to see that each program comes up to the high level expected and that the stations in their chains are the best. To doubly insure this the chains themselves sponsor entertainment and "cover" nationally important events. In this way they help better conditions in the industry.

A sponsor placing a program on a single station should insist upon the same practices. A feature of high quality placed on a station which permits a large amount of direct advertising is not so valuable as the same feature on a station with strict standards. A good station besides other features is one that establishes high program requirements.

The radio program must always be regarded as an ambassador to a court, not with a single monarch, but with millions.

Our City
comment & discussion
by F. F. RUNYON

Radio Must Be Kept Clean

PERHAPS, if you listen in over the radio, you have heard some male voice sing about living over the viaduct, "down by de winegar woiks," where the girls are so tough they have to tie 'em up so they won't bite the dogs. No, it's not particularly elevating, but it seems to be the popular request number and several times each evening it goes out on the air. Evidently it is the kind of thing that pleases.

* * *

THE other evening a child eight years old was announced. She was to sing. The first few words were about as follows, "I took a long drink, and it went to my head." Then followed a mess of suggestive stuff—by a child of eight years. Imagine the mind of an announcer who would allow the air to be polluted with that sort of stuff from the mouth of a mere infant!

* * *

ANOTHER popular stunt is to have a jazz band desecrate the sacred hymns. Think of jazzing "Rock of Ages," with all its fine sentiment and religious fervor and yet that is what is being done frequently. And these are but a few of the instances of abuses which are burdening the air. Just a few more steps in this direction and there will be public demand for censorship of radio programs.

* * *

THE radio, like the motion picture theater, can be made to build character or tear it down. Just now the tendency appears to be to [illegible] the privileges of the air. [illegible] ll lead to either censorship or the utilization of the telephone in the radio field. For some years experiments have been in progress to [illegible] in the [illegible] and [illegible] that might be attached to the telephone.

* * *

IF thi[illegible] successful it will be possible for the telephone company to give its subscribers the benefits of radio reception at a small, stipulated cost. For instance, if fifty cents per month were charged for this service, here in Pasadena at least eight or ten thousand subscribers might be obtained and perhaps a hundred thousand in Los Angeles.

* * *

WITH this tidy sum the finest programs in the world could be arranged, the artists paid fabulous prices, and all it would be necessary to do would be to turn on the loud speaker and have a ten or fifteen thousand dollar program in your home. The possibilities of this are enormous and the telephone company with its unlimited resources is experimenting to make it possible.

* * *

HOW this will affect the theater is a matter of conjecture. It

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HOW this will affect the theater is a matter of conjecture. It was at first believed that the radio as we have it in our homes, would put the theater out of business. The opposite has been the case. There are more theatergoers today than before the radio was invented. When interest is created in entertainment, all forms of entertainment prosper.

* * *

ONE would imagine that with the general use of the automobile railroad travel would be affected. It has, but not by decreasing it. Railroad travel has increased. More people are traveling now than ever before and another thing is noticeable—the people are traveling first class. Railroad men tell me that travel in second class or tourist cars is diminishing. They account for this very readily.

* * *

IN 1920, and directly after the war when everybody had money, people traveled first class and got the habit. Now they travel that way because they won't travel any other way. And so the tourist car is almost a thing of the past. The broadcasting station too, had better look out how it pollutes the air. It may find itself in the class with the tourist car. Jazzing the "Rock of Ages" is not the way to make friends. Allowing eight-year-old girls to sing songs about booze and vice can only get by with a certain element. Radio is entering upon a dangerous era.

Herald Tribune
5/15/26.

Millions Spent For Radio by Westinghouse

Research Manager Tells of $3,460,000 Expended to Keep in Field in So-Called "2 Billion Ring"

Owns 4,000 Patents

Engineer Credited With the Experiment Which Led to Present Broadcasting

How an engineer's experiments in his home led to the organization of a group of corporations of kindred industrial interests with assets of more than $2,000,000,000 within the last five years was related yesterday by Samuel M. Kintner, manager of the research department of the Westinghouse Electric and Manufacturing Company, testifying at the Federal Trade Commission's hearing on the radio monopoly, so-called.

Kintner also declared that his company had been compelled to expend $3,460,000 in radio communication and patent purchases alone in order to keep up with the tremendous advancement of the radio. He said the Westinghouse company owns 4,000 patents, of which a very large number relate to radio invention.

Planned News Service

Testifying before Examiner William C. Reeves, Kintner and a vice-president of the Westinghouse firm had at first intended to use the radio "like a newspaper."

Frank Conrad, of Pittsburgh, was the engineer whom Kintner credited with instituting the pioneer experiments in radio broadcasting which have developed into a new science with unknown possibilities. Conrad began, he said, by broadcasting scraps of news and musical reproduction from phonograph records from his home. Amateur wireless experimenters who caught his program sent him other phonograph records and aided him with suggestions.

"Finally, Conrad provided a program regularly every Wednesday and Saturday nights.," Kintner said, "and Pittsburgh department stores began selling small crystal detector sets. H. P. Davis, vice-president of the Westinghouse Company, told Mr. Conrad he was going to erect a broadcasting station at the Westinghouse plant in East Pittsburgh and take over his broadcasting program."

A few weeks before the Presidential election in November, 1920, the new station, KDKA, was finished. Its first big achievement was to broadcast the election returns. Mr. Kintner said the tubes for the Conrad experimental set were lent by him by the Navy Department.

Kinter was testifying for the third day in the government's investigation of a supposed $2,000,000,000 "radio trust," in which the Westinghouse Company, the General Electric Company, the Radio Corporation of America, the American Telephone and Telegraph Company, United Fruit Company and others are accused of gaining and then dividing control of the radio industry.

During the war, Kintner said, the government guaranteed manufacturers who supplied it with wireless apparatus to hold them blameless for patent infringements. He said this caused wholesale production under adverse patent arrangements and resulted in such a mass of lawsuits that it was almost imperative for the companies to get together on a common production basis.

So-Called Pool Explained

The Radio Corporation of America is alleged to have received the right to sell radio sets, while the Western Electric Company, the General Electric and the Westinghouse company got the manufacturing rights. According to Mr. Kintner, the patents which the Westinghouse firm acquired were chiefly those of Professor Reginald Fessenden and Edwin H. Armstrong, and these were transferred to the so-called patent pool by sale and license agreements.

Primarily the Westinghouse firm was interested in the manufacture of apparatus rather than wireless communication, Kintner said, but it was willing to spend $2,500,000 on radio communication alone "in order to get in on the patents involved therein." Besides this sum, he said, the company paid out $870,000 additional for certain patent licenses considered essential to the future radio business of the company. He said these patents were protected in twenty-four foreign lands.

Following the direct examination of Kintner by Edward L. Smith, counsel for the Federal Trade Commission, he was cross-examined by F. H. Wood, chief counsel for the Westinghouse company.

FOUNDING OF KDKA BEGAN WITH WATCH

Dr. Conrad Was Interested in Time Signals.

PITTSBURGH, Feb. 5 (A. P.).—The pride of an eager young engineer in the cheap watch he owned in 1912 figured largely in the birth of radio broadcasting.

The owner was Dr. Frank Conrad, now assistant chief engineer of the Westinghouse Electric & Manufacturing Company and recent recipient of the Edison medal of the American Institute of Electrical Engineers.

His work led to the establishment of KDKA here in 1920 as the first broadcasting station operating on a scheduled program. Since then he has seen broadcasting become the giant of the radio industry, advancing so rapidly that he sees synchronization — placing stations carrying the same program on the same wave length—and television becoming virtually "talking movies by radio," as the only important developments in the future. Television, he thinks, will take years of experimenting before it is generally accepted.

Conrad, the young engineer rapidly making a name though without college training, had no thought of broadcasting, one lunch hour in 1912, when he pitted his watch against the more expensive timepiece of an associate to determine which kept the most accurate time. Yet the contest led him to master the radio devices of the day so he could check his watch against Arlington's time signals.

Picking up those signals created an interest in radio in general. That interest resulted in his setting up his own station. Experimentally playing phonograph records over the air brought demands for more and more from the possessors of the crude receivers of the day. Interest thus created about Pittsburgh led one store to advertise apparatus with which to pick up Conrad's programs. That attracted H. P. Davis of Westinghouse to the commercial possibilities of broadcasting, KDKA was established.

Today Dr. Conrad is solving some of the last problems associated with synchronization of radio stations to make room on the air for others. The problems are not simple. Synchronization involves the setting of the wave length of all stations on the chain from one control point, overcoming the complexities introduced by time and distance so all stations will be in step. Synchronization will be commonplace soon, though, he believes. It was his work on that problem that did much in bringing him the Edison award.

Television is a different matter. Looking upon the picture now received as relatively crude, he thinks their quality must be improved until it at least equals that of a good newspaper picture before television will be accepted as moret han - -lty.

THE NEW YORK SUN, THURSDAY, FEBRUARY 5, 1931.

game from the pla... Field, reporting the ... burgh and Philadelphia.

September 12, 21—The first ... speech broadcast from station KDKA William A. Magee, seeking nomination a... Republican candidate for mayor of Pittsburgh.

September 20, 1921—The Pittsburgh Post studio was installed as a member of the KDKA chain.

FIRST BEDTIME STORY.

November 11, 1921—Marshall Ferdinand Foch, generalissimo of the allied armies during the World war, spoke over KDKA.

November 19, 1921—The first bedtime story was broadcast from KDKA.

November 23, 1921—The first broadcasting from a Catholic church, from Old St. Patrick's Church.

January, 1922—First play by play reports of a football game. KDKA transmitted a detailed report of the game between the University of Pittsburgh and the University of California at Pasadena, Cal.

January 3, 1922—The concert of the Carnegie Glee Club was broadcast through KDKA.

January 13, 1922—The concert of the Philadelphia Symphony Orchestra was broadcast.

March 12, 1922—William J. Bryan spoke from the pulpit of the Point Breeze Presbyterian Church over the radio.

November 7, 1922—First radio wedding. The marriage ceremony which united Miss Bertha Anna McCunn and George Albert Carver was broadcast through KDKA.

December 4, 1922—The first program by the KDKA Little Symphony Orchestra was broadcast on this date.

February 12, 1923—The first drama was given from station KDKA.

March 1, 1923—First daily organ recital.

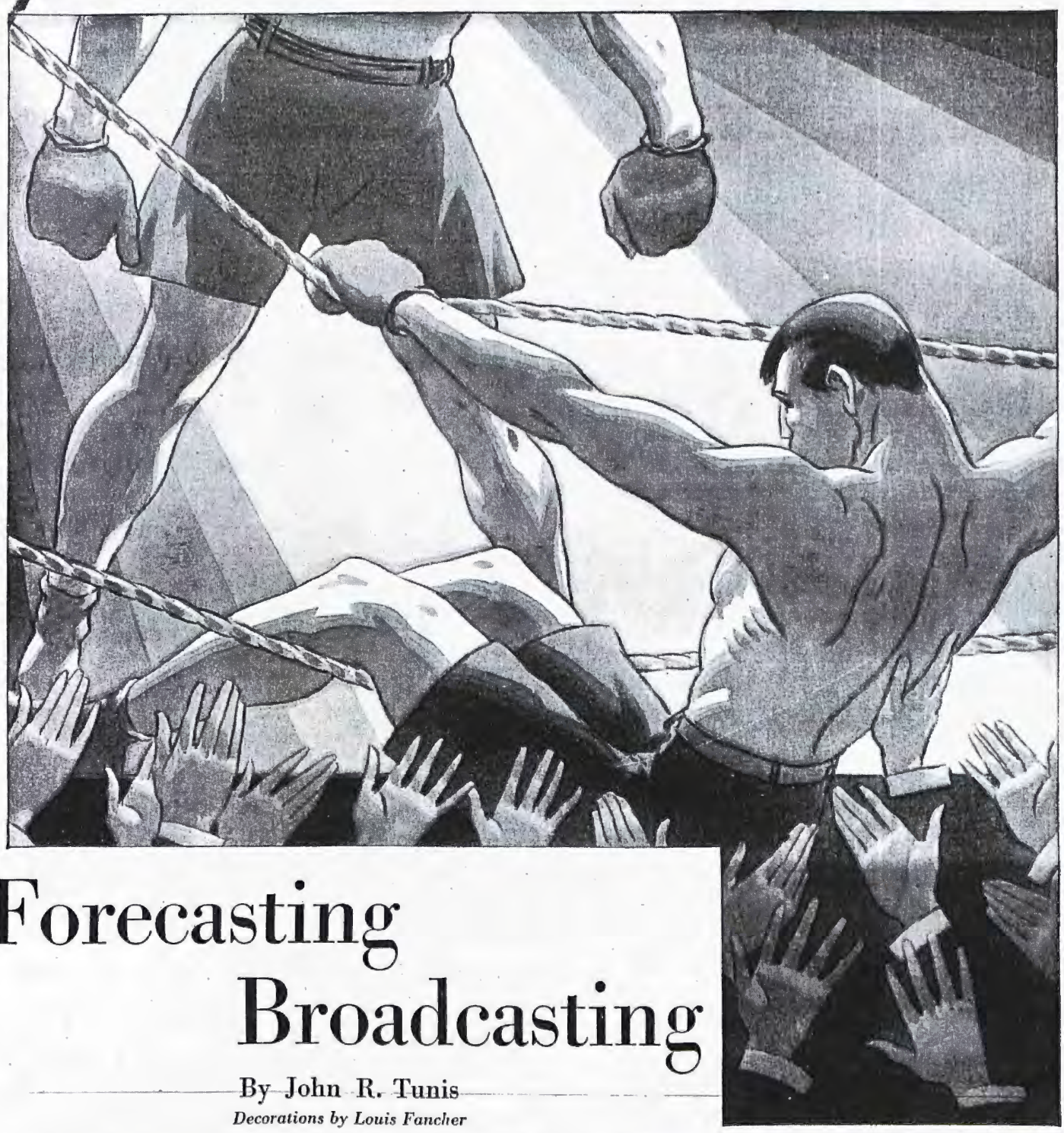
June 4, 1923—Memorial radio tablet placed on church. The tablet was dedicated at the Calvary Church by Rev. E. J. VanEtten.

October 1, 1923—First broadcasting of reports of air liner progress. The trip of the ZR-1, later known as the Shenandoah.

March 7, 1924—First linking of stations of the United States and Great Britain.

March 25, 1924—KDKA's first Spanish program broadcast direct to the nations of South and Central America, a Spanish program.

January 26, 1925—First successful broadcasting to Australia.



Forecasting Broadcasting

By John R. Tunis

Decorations by Louis Fancher

DO YOU remember your first experience of all with the radio, your introduction to broadcasting? I know I shall never forget mine.

It was a clear, crisp night in fall, seven years ago, the 14th of September, 1923. High up in the tower of a house perched on a hilltop far above the gleaming lights of the steamers below on Long Island Sound, two men were fiddling with a radio which in those distant days seemed the very acme of perfection. Silently they handed me one of the three sets of earphones as I entered the tower, and ten minutes later we were listening to the magical words from the battlefield a hundred miles away.

"Dempsey's down . . . he's over the ropes . . . one . . . two . . . three . . . now he's being shoved back into the ring . . . he's up . . . on his feet . . . they're in a clinch . . . Dempsey leads with a right to the jaw . . . *Firpo's down.* . . ."

Stirring moments. Perhaps your introduction to the radio was as tense and thrilling as that, as vivid and clear cut and memorable as that cool night seven years ago this fall will always remain with me. Or perhaps more so. Only by such throwbacks to the past can the average individual, who is apt to take progress for granted, really appreciate the advances that have been made in radio during the few short years between the Dempsey-Firpo fight and the present day. From nothing, this newcomer to the world of business has grown into one of the leading industries of the nation. Eight years ago the United States possessed one broadcasting station: KDKA, of Pittsburg, Pa. To-day there are 630! Eight years ago there were no receiving sets in existence as we know the term, only a few home-made crystal affairs that were in the nature of toys. To-day there are approximately twelve million radios in use, some costing more than a thousand dollars apiece. Eight years ago there was no such thing as entertainment broadcasting. In 1928, $5,000,000 was paid in salaries to radio entertainers through the National Broadcasting Company alone, and 1,000,000 appearances were made before the microphone. This brief résumé of the growth of radio makes one realize that in eight short years the business has reached almost the same proportions that a mammoth and fast-growing industry like the automobile business has taken four times as long to reach.

If you glance back a bit you find that the history of the radio industry is as much as anything the life story of Dr. Lee de Forest, the inventor, and to-day the President of the Institute of Radio Engineers. He has been a pioneer in both radio and wireless telegraphy, and in 1906 invented the audion, or three-element vacuum tube oscillator, and other applications. It was due to his efforts that the first public broadcast in the history of radio took place in New York in 1910.

In the spring of 1910, Enrico Caruso, standing upon the stage of the Metropolitan Opera House, gave the first public broadcast, a short program of songs which were listened to by only a few hundred persons in and about Manhattan Island. Ocean liners at sea, amateur radio enthusiasts, and a

scattered band of commercial operators were the only ones to hear his voice upon that historic occasion. A far cry from this intimate and personal moment, when the announcer was also a master mechanic who kept a hammer ready to sock the microphone when the carbon buttons "froze," down to the elaborate, systematized and expensive programs of 1930. Which, by the way, we kick about.

II

MOST of us are just a little apt to take the talent that falls upon us through the air pretty much as a matter of course. We consider it our rightful due. After all, haven't we bought an expensive P. D. Q. set, and haven't we a right to criticize the programs fully and freely whenever we don't like them?

Well, as a matter of fact we haven't. And perhaps a look behind the scenes in the radio industry and in the broadcasting profession will show you just why we have no such right.

There are to-day three kinds of programs upon the air: commercial programs, sustaining programs, and so-called fifty-fifty programs. The best example of the first named is the famous Amos 'n' Andy skit every evening, a feature that is frankly set forth by the Pepsodent Tooth Paste Company for entertaining and advertising purposes combined. The commercial program is, of course, the one that pays the bills, the one that supports broadcasting to-day. Next there is the sustaining program, an hour or a half-hour in the off-moments of the day when the studio itself is obliged to hire artists in order to have continuity in its program around the clock. These artists may contribute songs, sketches, music, or anything else; they are hired and paid solely by the station over which they are heard and have no connection with any industrial concern. The third programs are those in which the studio and some outside corporation combine to put on an hour together, each paying a share of the cost.

Who pays for broadcasting? Since its infancy, commercial advertising has supported our entertainment through the air. Mr. Merlin Hall Aylesworth, the President of the National Broadcasting Company, in an address at Princeton University in 1928, answers the question:

"Big business has discovered for itself that in addition to other established channels of communication, the air can carry a mighty message of *good-will* to millions of men and women."

Very true. But the past two years have made vast changes in the economic structure of the country. Business is keener to-day, competition is fiercer, profits are smaller, and at present a great many of the big industrial concerns that go on the air are beginning to wonder whether a message of *good-will* can not be bought at too high a price. In fact, some of them are so uncertain about the matter that they have started an investigation by the Crosley Company, a research, survey and statistical organization, to find out just exactly what they are getting from the air. This investigation, sanctioned by the Association of National Advertisers, has unearthed some interesting facts about radio and broadcasting.

THUS, while some corporations report increased interest and sales following programs on the air, the majority are not happy about the value of broadcasting. One large manufacturer states that "the fan mail received is in many cases distinctly valuable, but often it is merely praise for the performer and furnishes no better list of prospects than the telephone directory does." Mr. G. C. Furness of the National Carbon Company, says: "People write to tell how pleased they are. They seldom write to express displeasure—it is far easier to spin the dial to another station."

Again Mr. H. A. Bellows, Manager of WCCO, in Minneapolis, remarks that "mail response is a most unsatisfactory clue because, as many of you have already discovered, the listeners whom you are most anxious to reach are the ones who seldom or never take the trouble to respond to a radio program."

Now when the great national advertiser buys space in a magazine or a newspaper he can estimate fairly closely how many persons he is reaching and the effect his message will have. Mr. Bellows puts it this way: "With every other medium (except radio) you have some definite check on the number of people reached by your advertising message. In a newspaper or a magazine you have an audited circulation statement."

But the newspaper business is as old as Moses, whereas the broadcasting industry is only eight years old. The merchant to-day who pays for a costly program on the air cannot tell exactly how many thousand persons are listening in when he spends hundreds of thousands of dollars for a nation-wide hook-up. For the very good reason that no one knows. No one has any definite idea precisely how many radio sets are in use in the United States to-day. Estimates have been made, but they remain just that—estimates. Nor does anyone know with accuracy the number of persons who listen in on each set. The poor manufacturer who has been supporting programs merely knows that he is buying good-will, and that in these days of price-cutting and intense competition he may be paying too high a price for what he secures.

In other words, the manufacturer who during the past seven years has dug into his pocket, who has been putting up the money for us to sit at home and growl about the programs, is getting a little tired of holding the bag without knowing exactly what the bag contains for him. Don't forget that commercial broadcasting has made possible all the entertainment we receive nightly through the air, and that the moment these gentlemen who furnish it get convinced that they are spending money needlessly, everyone of us who owns a radio is going to be the loser.

III

IN 1927, Station WEAF charged $600 for an hour over the air, and in 1929 it had mounted to $750. But this is only a small part of the expense of broadcasting, only a small part of the increasing tariff which the man who furnishes us with our amusement is forced to bear. Formerly he put on a small program at a small cost for a limited portion of the country, or even the State in which he desired to create consumer demand. To-day that possibility has gone; now to reach a certain locality the manufacturer of nationally known products must buy almost a nation-wide hook-up. No wonder this gentleman who has been paying our radio entertainment bills begins to speculate as to whether the good-will Mr. Aylesworth speaks of is worth the price.

Nor is this the only way in which broadcasting costs have increased. Originally everyone was delighted to go on the air, at a chance to talk in a real broadcasting studio. It used to be an honor to know a man who had broadcast; to-day there are hardly a thousand persons in the entire country who haven't been before the mike, and they are deaf and dumb. The time when talent was given freely for nothing has passed forever; at present the manufacturer who is arranging his program discovers that he must pay

technical developments, costs must continue to go upward.

B. Broadcasting stations are not big money-makers.

1. Small stations are running into the red.

2. Even large stations show small profits.

C. All of which means that the ultimate cost of entertainment on the air is falling upon the manufacturer or sponsor of commercial broadcast programs. And that those of us who own radios and tune in every night are getting an awful lot of amusement at practically no cost to ourselves.

Suppose the angels of radio get tired holding the bag, as they are beginning to show signs of doing now? Then all of us who are listeners on the air stand in danger of losing our entertainment over the radio. Unless some equable solution can be found for the whole perplexing problem.

What are some of the possible solutions?

V

"PERHAPS at no period in its history has the future of radio been cloaked in such a varied number of opinions as those in which it appears on the commercial stage to-day."

So speaks Mr. M. F. Flanagan, the Executive Secretary of the Radio Manufacturers Association. There are as many guesses about the future of radio and of broadcasting as there are guessers. What I propose to set down here, however, are not guesses. They are possibilities, some of them probabilities; the opinions of the leading minds of radio, and they give those of us who own receiving sets some idea of what the next ten years may bring over the air.

Needless to suggest, no one person, not even a weather prophet, can say dogmatically that the radio of 1940 will be this, that or the other thing. The inventions of science, the eager, creative genius of the American nation, the demands of our people for new and newer luxuries, which is so typical of our time and age—all this will produce changes, adaptations in broadcasting through the years to come that few can foresee definitely. But, nevertheless, certain avenues lie open, indeed are being explored already, in an effort to find the solution to the problem which confronts American radio to-day.

Perhaps the most obvious solution, although in some ways least to be desired, is to make broadcasting financially possible by more direct advertising. In this way, permitting the various sponsors of programs to sell goods over the air as they are seldom allowed to do at present, thus reimbursing themselves in sales for the vast sums poured out in hourly entertainment. Mr. Stuart C. Mahanay, in a recent number of "Radio News," shows the trend away from indirect advertising, or an attempt to build up goodwill over the air such as we have to-day, to direct advertising, or a straightforward effort to make sales during a program.

"In the early days of radio," he says, "announcements were usually of short duration, simple and concise. But to-day advertising announcements over the radio have expanded to unbelievable dimensions. The average layman is told not only who the senders are and the names of the products which they manufacture; but also a thousand and one other superfluous and boring details."

These details may well bore us; but we may have to submit to them. All listeners must have noticed in the past six months the increased attempt toward direct advertising in radio programs, must have observed the growing amount of selling which is going on over the air. Mere good-will is no longer considered a sufficient recompense for an expenditure of ten thousand dollars a week in broadcasting. And certainly no one will consider this an unreasonable viewpoint. The manufacturer must market his product, must increase his sales if he wishes to continue his weekly hour. And, therefore, he justifies giving a greater and greater amount of time during that hour to matter of a purely commercial nature.

"Oh, I don't listen to that. I just switch off to another station," you say. Precisely. But suppose all the other stations are doing the same thing, as inevitably they would be forced to do. You do not like it, neither do I. But we may have to like it. In this way we may be obliged to pay our proper share of the cost of broadcasting, a share which to date we have never borne, as radio owners in foreign lands have done. The public may not like it; perhaps they will have to stand direct advertising over the air, nevertheless. Or else go without radio entertainment.

VI

AT THE exact opposite extreme from this lies the situation where radio flourishes without any advertising at all. We have just considered the possibility of radio's support through a frank and open avowal of the air as an advertising medium; now let us consider the other side, that in which no advertising of any kind is permitted. This is the answer to the problem of radio costs that has been adopted in England and some of the British colonies; a solution called "Government Control."

In the British Isles the radio owner applies directly to the post-office for a license to run his set. This costs five shillings, or a dollar and a quarter. These five shilling pieces which radio owners pour into the post-offices support the British Broadcasting Company and its two large studios, 5XX London, and

(*Continued on page 51*)

and pay well for the entertainers of the evening. Let me give you some inside facts upon the situation.

It is generally considered that Amos 'n' Andy are the highest-priced features of the air. This is untrue. In April, 1930, the latest month for which figures are obtainable, the most expensive feature on the air was the American Radiator Hour, costing just over nine thousand dollars per week. Next was the E. R. Squibb program with Will Rogers as headliner at a cost of six thousand, then the Coca Cola Hour and the Fleischmann Hour with Rudy Vallee, each costing four thousand, the MacFadden Hour at three thousand, the General Electric Hour at twenty-eight hundred, and so on. The Pepsodent Company, employers of Amos 'n' Andy, are not listed among the twelve leading hours of the air during the first quarter of 1930. And it is no secret that this hour is by no means the cheapest, either.

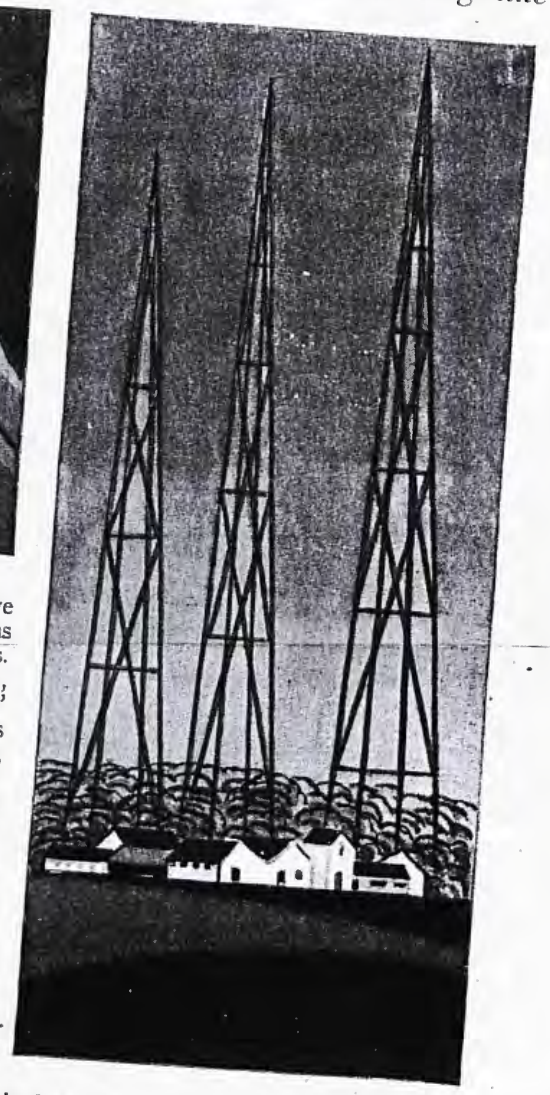
IN THE Crossley report it is stated upon excellent authority that Paul Whiteman receives five thousand dollars for each performance of his orchestra, Vincent Lopez and Ben Bernie from twelve hundred to twenty-five hundred apiece. The introduction of this talent has had only one effect. The radio public, which spent its time the first years getting distance, gave that up long ago. Now it twists and turns the dials with the air of a connoisseur at the opera. It wants, demands, insists, in fact, upon huge and expensive programs, with nationally known singers, humorists and musicians to entertain it.

Do not forget that besides his talent, the manufacturer who has been furnishing four-thousand-dollar programs to listeners at a cost of a few cents apiece (Mr. E. J. MacDonald, the President of Zenith Radio, figured recently that "for less than a cent an hour any home can have $75,000,000 worth of talent") must also pay station charges. Thus over the Columbia System he must pay $4,715 an hour, over the National Broadcasting Company System he will be obliged to pay $4,890 an hour. This means $500,000 a year for an average program upon the air. No wonder the gentleman who furnishes us with this entertainment is beginning to be staggered by the expense of it, no wonder he is speculating as to just how much longer he can continue this game merely for the goodwill which the broadcasting authorities mention.

Does this give the impression that the big broadcasting systems are waxing rich at the expense of the manufacturing concerns who supply programs? If so, it is a totally wrong impression. For despite the fact that their fees to the sponsors of various hours have mounted steadily, the broadcasting stations are with difficulty earning their dividends. Expenses for new equipment, for continued, efficient and up-to-date service, for "free" programs, such as football games, World's Series, and the like, besides costing money, cut into the time and therefore the profits of the concerns who run the stations. In discussing the growth of the National Broadcasting Company, which he showed was not a big money-maker, Mr. Aylesworth stated recently that it lost money up to 1927, even in 1928 ran at a small deficit, and not until 1929 did it become self-sustaining. "We will have a little money left over (in 1929) but because of the progress of the art it must be put back into the business."

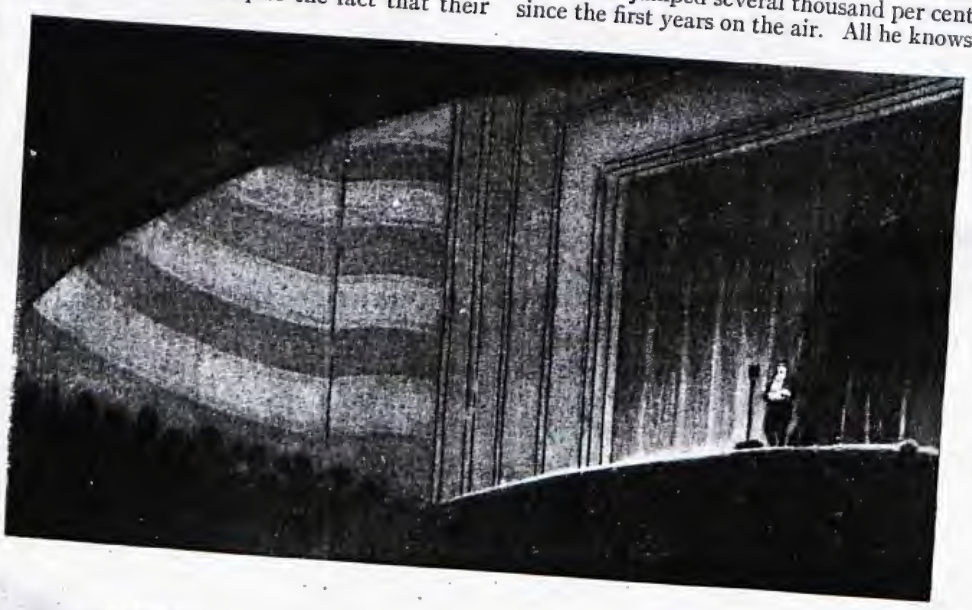
Unquestionably, the big broadcasting stations are failing to make money. Many of the smaller and less fortunately situated ones are going into the red every month; some of them have failed and are failing. Says Mr. R. S. Robinson, in the January, 1930, number of "Broadcast Advertising," the trade paper of the business: "When the Federal Radio Commission made its report on broadcasting conditions to the United States Senate not the least interesting feature was an item to the effect that more than half of the country's commercial stations operated at a loss during the twelve months covered by the study."

But this does not help much the manufacturer who furnishes the programs. The mere fact that the broadcasting chains are not paying large dividends on their investment is little consolation to him when his costs have jumped several thousand per cent since the first years on the air. All he knows



is that the hour which was once valued at a hundred dollars now costs thousands. That the singers and entertainers who were formerly available for nothing, are now as heavy an item in the expenses of the evening as the actual time he buys from the station. Do you wonder that he is starting to look around and suggest that someone else hold the bag for a while?

He is, too. Thus the Eveready Hour, the oldest hour on the air, a feature that has been steadily before the radio public since the beginning of commercial broadcasting seven years ago, this year cut its appropriations for broadcasting from an hour to a half hour. What radio fan does not remember the old Philco Hour with Jessica Dragonette and Colin O'Moore? Philco Hour was once a weekly program over the N. B. C. network; some time ago it cut its time to half an hour, and shortly afterward left the N. B. C. system for the less expensive Columbia system. Do you remember the Happiness Boys, Billy Jones and Ernie Hare? The Happiness Hour is no more. The man behind the bankroll simply can not stand the gaff. He is getting a little tired of furnishing entertainment without any certain direct return therefrom.



IV

THE situation, then, in which we find ourselves in regard to radio, is something like this:

A. Radio broadcasting is *not yet* on a financially sound basis.

1. Good broadcasting is expensive in all phases.

2. Each year since its birth, upkeep has mounted.

3. If stations are to be kept abreast of

income from a typical course. A church is achieving the same result by means of a course operated and largely patronized by members. Throughout the country the miniature courses contributed their share toward prosperity by offering not only recreational facilities but employment during a period of depression.

The story of this development is not without its moral. Students of sociology are pointing out with convincing insistence that much of the recent juvenile delinquency, as well as crime on a more serious scale by youths still short of their majority, may be traced to the limited opportunities for play afforded boys in many large cities. Unless he lives somewhere near a municipal park or playground, baseball must remain a forbidden sport to the modern city boy. Local ordinances no less than the hazards of swiftly-moving traffic eliminate the streets as playground outlets for the boundless energy of youth. Perhaps a wider prevalence of such courses as are here described, or similar miniatures of the fields on which other sports are played, may help solve some of the moral problems of the boy, as they can the psychological and physical problems of fathers who have not yet grown too old or too dour to realize that recreation is a necessity for the adult as for the child. One obvious suggestion is that in any club thus equipped an interesting series of father-and-son tournaments, such as are now staged by many country clubs, would offer splendid recreational facilities to both as well as develop that kinship of spirit which represents the true joy and responsibility of parenthood.

Why not, if I may suggest it here, consider the possibility of installing some such course in your own club? The revenues from fees will probably pay for it within a year, as experiments have demonstrated the country over. As a new and appealing attraction, it can create a fresh interest in the club itself, bringing there at the luncheon hour as well as at night, members who realize the advantage of relieving the tension of the daily job by a brief period of such relaxation as only play affords, or of eliminating some of the avoirdupois so likely to envelope one insidiously during the winter months.

Courses such as I have described can be constructed in a few weeks. Amateurs have done the job quite adequately themselves with the assistance only of local workmen when desired. Apart from other advantages, the course may prove a distinct publicity asset. As I have pointed out, the famous stars of the game are always glad to play over such a lay-out, for the purpose of keeping in form and at the same time enjoying a little friendly competition. And if some widely-advertised professional does attend, it won't be necessary to pay him the $200 or $500 which might be asked for an exhibition round on the country club links. He'll probably be glad to spend thirty minutes with you after lunch trying out the wee shots. And when he does, you may be sure that every member who ever held a brassie or iron in his hand will be there to watch and to renew his interest in the club as a whole.

Forecasting Broadcasting

(*Continued from page 29*)

2GB Daventry, near Birmingham, in the center of the kingdom. There are in all twenty-one stations in England; but these are the principal ones. For their support English listeners last year paid *five and a half million dollars in license fees.*

It is the British Broadcasting Company, therefore, a government department, that has charge of English broadcasting. Of course, no advertising matter of any sort is sent over the air in any of their programs. I have listened at intervals of several years to the broadcasting from London and Daventry, and the total lack of commercial appeal is soothing to American ears. It may seem strange at first not to be told continually just who is responsible for the program, what he makes and why, but you gradually get used to it. There is, however, another side to the picture.

Despite the five and a half million dollars received, no government department has the funds of a private concern like the National Broadcasting Company; and if they had the funds they would probably lack the initiative and resourcefulness of the latter concern. You can take it from me that there are no ten-thousand-dollar-an-hour programs sent over the air from either of the two English stations. The programs one does hear in England are usually entertainments that would be considered lacking in punch and pep by most Americans. Much must be allowed for a difference in national temperament, much also for the fact that the average Britisher has not been educated up to the point where he must have a Rudy Vallee, a Will Rogers or an Amos 'n' Andy every time he twists the dials. Yet, although their programs lack the length and diversity to which we are accustomed, in general tone and in educational value they are superior to the average hour given over most American systems.

Perhaps this is due to a gentleman who has had a good deal of criticism to withstand, Sir John Reith the Director-General of the British Broadcasting Company. In a recent speech he remarked:

"To give the public what it wants is a dangerous and fallacious policy." He, therefore, gives them what he thinks they should like. And probably they do. At any rate, a writer in the London *Observer*, after the exchange of programs between this country and England at Christmas time, said,

"A few such programs would convince any person of taste that our monopolistic British system produces music beyond comparison superior in quality to that sent from America."

One thing is certain. Few American radio owners would be content with the sort of thing sent out over the B. B. C. to-day. If he paid his porportionate share of the cost of expenditure at our big stations in this country to-day, the American listener would pay radio taxes of from ten to fifteen dollars a year. And whether he would, after years of free service over the air, agree to this tax, is a question broadcasting authorities would like very much to know.

VII

ONE of the biggest problems of radio in this country has been the question of charging for the service rendered. To date the home owner who buys a radio is able to help himself freely to all the good things of the air, with no way existing by which he can be assessed for this entertainment. Such a method is now foreseen by leading radio engineers in the new wired wireless, an invention that will permit a company like the National Broadcasting Company to charge the listener for all services rendered, and thus put the broadcasting business on a firm and sound economic basis.

Wired wireless consists merely in sending radio signals along wires instead of through space as is done in ordinary radio. It can thus be controlled both as to direction and extent of its signals, whereas in modern radio the signals devolve in every direction for more or less intermediate distances.

Wired wireless, moreover, is being developed to make use of existing facilities, such as electric light, electric power, telephone and telegraph wires; this use wholly independent of and simultaneous with the use of these lines for their primary purposes. It is, for instance, possible, although not as yet commercially practicable, to employ ordinary electric light wires for the use of wired wireless so that the householder can, of course, continue to receive current for his lights while at the same time, over the identical wires by means of a special receiving set properly installed for that purpose, he is receiving speech and music.

Wired wireless was the invention of Major-General George O. Squiers, and during the last few years has been the subject of considerable experimentation and improvement. Although it is not as yet a commercially feasible undertaking, one does not need as much imagination to visualize it supplanting broadcasting of the present day as was necessary twenty years ago to prophesy the radio situation of 1930.

There are still in the problem of wired wireless any number of small technical difficulties yet to

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Forecasting Broadcasting

(*Continued from page 51*)

be overcome. Thus, it has to be determined whether light wires, telephone wires, or perhaps both, will be employed. There are other obstacles in the way, "bugs" as the radio engineers term the problems that stand in the way of successful solutions of radio questions. Once solved, wired wireless would permit telephone, telegraph and electric light companies to step forth into the entertainment field, or perhaps to rent their facilities to the present day stations, thus fulfilling a dual rôle and obtaining a dual revenue. All this is in the future, the not very distant future, perhaps, either. Definitely, it can be stated that wired wireless to-day offers a possible escape from the economic traffic jam into which radio broadcasting has worked itself at present.

VIII

"YOUR father is angry—you coaxed until he paid $200 for a television attachment to the radio and you only used it once."

"But Mama, that good-looking boy hasn't been on the air since."

When Paul Robinson wrote those lines in the Chicago *Evening Post* in 1928 he did not intend to be prophetic. Yet, in less than two years the art of television—or seeing at a distance—has progressed so far that if you have not yet bought this gadget for your radio, you can buy one in the market to-day.

Already this new science has developed to such a degree that the term television is not definite enough. There are already several kinds of television; but the art is so crude that the neutral scientists do not know just which of the present methods will eventually become the most satisfactory form. They do agree on one thing, however, that television is *now* possible and will, some day, be commercially practicable.

Any serious consideration of the future of broadcasting, therefore, can not be limited to audible broadcasting, especially when "visual broadcasting" is now being carried on through 9 regular and 18 irregular stations scattered throughout the United States. The Jenkins Television Company, for instance, has two such Sight Broadcasting Stations; one, W2XCR, is located in Jersey City, New Jersey, and regularly broadcasts every week day from 3 to 5 and from 8 to 10 P.M. The other, Station W3XK, is situated in Maryland, near Washington, D. C., and broadcasts between 8 to 10 P.M. every week day.

What are some of the different kinds of television? The Bell Telephone Laboratories have been working on some of the problems of television for a number of years and since their engineers are telephone specialists, it is only to be expected that their method of attacking the problem involves the use of wires. To-day wired television is a practical science; the images are sharply defined. Another distinct type of television uses space instead of wires and is called radio television, or radio-vision to differentiate it from the wired form. It is quite obvious that the difficulties which have been overcome and those yet to be overcome are much greater and more complex than the troubles encountered in wired television in much the same degree that wireless telegraphy was a greater achievement than the older wired telegraphy.

Television is broadcast over a short-wave length, consequently the little band of seeing-at-a-distance enthusiasts must use a short-wave receiver to intercept properly these slight broadcast signals. They must also buy another piece of apparatus called a televisor or a radiovisor; cost from $85 to $395.

One future development may not unlikely be a combination of sight and sound-broadcasting. If transmitted over the wires as a form of wired wireless, this would permit the listener being charged directly for the entertainment received. In any event the future of television can not be lightly dismissed. Many persons still believe that "Seeing Is Believing," and the Chinese maxim that a picture is worth ten thousand words. Corporations interested in the radio field must keep abreast and ahead of the times, and all big concerns are working along their own lines on television. Back in 1928 Dr. Alfred N. Goldsmith of the Radio Corporation of America, filed a brief on the subject of television before the Federal Radio Commission in which he made the statement:

"Radio television is at a stage where it is prepared to leave the seclusion of the research laboratory and enter into the daily affairs of men."

In the short space of two years these words have been amply confirmed. Television has left the laboratory and is becoming a factor in actual broadcasting. If this progress continues at the same rate, the next two years will see television taking its place in partnership with sound broadcasting.

IX

THE American nation has passed through several phases of radio consciousness. There was the first and early period from ten until five years ago when we had the craze for sets. Almost anything that could be manufactured could find a buyer. Small boys and mechanically minded gentry spent their spare time building sets from spare parts bought here, there and everywhere. Gradually that phase passed away and for a few years we settled into the craze for distance. Old men and young men sat up all night trying to get Dallas and Omaha and Salt Lake City, and then spent most of the day boring people with accounts of what they had heard in the tiny hours of the morning. This phase also wore off, and the radio public began to turn its attention to programs. It demanded better and better features, more and more headliners during its favorite hours. Many concerns were forced onto the air to keep up with the procession, and once broadcasting they were obliged against their will to hire expensive entertainers. Rivals found it necessary to follow suit. All America entered into the latest phase of radio; the program phase.

Before long everyone became a program authority. Simple concerts or programs that once were delightful, were listened to, if at all, with disdain. Everyone began to explain why this or that hour was no good. The mere fact that we were all getting something for nothing never occurred to us. Said the President of the National Broadcasting Company: "Radio in the United States has become to be accepted by the listener as an inalienable right, something he is perfectly free to criticize or condemn. It is taken for granted, and it seldom occurs to the listener that he is enjoying a privilege without cost, when he tunes in on a program he wishes to hear."

Forces are working to make us all face the facts, however. These forces are stronger than any of us, stronger than the National Broadcasting Company or the United States Government. They are the inexorable laws of economics. For eight years radio fans of the country have been getting something for nothing. The time is coming when they must contribute their share of the burden of the entertainment they have enjoyed since the inception of broadcasting over the air.

How will this support be worked out? Will it be in the form of governmental control as in England? Will it be in the shape of more direct advertising over the air, with revenue coming to the sponsor of the program therefrom? Will it be wired wireless? Or television? Or some or none of these solutions, perhaps something as yet undiscovered? No one exactly, not even a Lee de Forest, can say. This much we can state definitely. As it exists to-day, broadcasting is economically unsound. It is gradually losing its hold upon the manufacturers who have in the past been sponsors of our programs over the air. The public having now tired of the novelty of radio, demands expensive and costly features. And the public contributes almost nothing toward the cost of those features. It is a situation which cannot continue.

No one can tell precisely what broadcasting will be in 1940. But it can be stated dogmatically and with certainty that it will be as different from the broadcasting of 1930, both in the manner of its presentation and the source of its financial support, as the early automobiles of 1905 are different from the latest de luxe model of 1931.

R. C. A. BACKS RIVAL TO BUCK POSTAL, W. U.

Forms Communications Subsidiary to Take Over Its Message Business.

HARBORD PRESIDENT

World-Wide Wireless System Between U. S. and Other Countries.

By ELMER C. WALZER,
Financial Editor, United Press.

NEW YORK, March 16.—Radio Communications, Inc., a new wholly owned subsidiary of Radio Corp. of America, was formed today to take over the communications business of that corporation.

This move followed a long series of conversations with Western Union and Postal Telegraph officials toward merger with Radio communications branch. The proposed merger with Radio was contrary to the anti-trust acts and no way had been found to circumvent the statutes. Today's announcement leaves Western Union and Postal out of the picture, building up a new competitor for both in their own fields.

HARBORD PRESIDENT.

Gen. James G. Harbord, in addition to his duties as president of Radio Corp. of America, was elected president of the new R. C. A. Communications, Inc., the other officers being:

W. A. Winterbottom, vice president in charge of communications; C. P. Taylor, vice president in charge of engineering; Col. Samuel Reber, vice president and general foreign representative; George S. De Sousa, treasurer, and Lewis MacConnach, secretary.

The directors are: Cornelius N. Bliss, Paul D. Cravath, H. P. Davis, Col. Manton Davis, James G. Harbord, E. W. Harden, Edward J. Nally, David Sarnoff, James R. Shefield and Owen D. Young.

PLANS DEVELOPMENT.

Radio Corp. of America Communications, Inc., it was announced, is taking over the transoceanic and other point-to-point communications interests of the Radio Corp. of America and will enter upon a program of communications development to maintain the position of this country as the center of world-wide wireless communications.

In addition, it is expected that the services of the new company will be made available to a number of inland cities. Applications are now pending looking, not only to radio competition in domestic telegraph service, but also to the extension of R. C. A.'s comprehensive system of overseas radio circuits.

LOGICAL STEP.

General Harbord declared that the organization of the new company was a logical step in the progress and development of radio communications in this country.

"The time has come," he said, "when the great wireless facilities of the United States, to which the radio and electrical industries of the country contributed so much, should develop independently of the manufacturing and sales interests of the Radio Corporation of America. To-day our world-wide wireless system

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APPROVES TRANSFER.

The Federal Radio Commission on Tuesday approved the transfer of all station licenses, frequencies and construction permits held by the Radio Corporation of America to R. C. A. Communications, Inc.

From its central offices in New York, the new communications company operates a world-wide wireless system between the United States and Great Britain, Norway, Sweden, France, Germany, Poland, Italy, Holland, Belgium, Turkey, Portugal, Liberia, Argentina, Brazil, Colombia, Venezuela, Dutch Guinea, Porto Rico, Dutch West Indies, St. Martin, Cuba and via San Francisco, Hawaii, Japan, Philippines, Dutch East Indies, French Indo-China, Hong Kong, and Australia.

Formation of R. C. A. Communications follows a similar step taken last year in formation by Radia of Radio Marine Corp. to take over Radio Corporation's marine activities.

Broadcasting =:

Pres. Aylesworth Discusses Growth of Broadcasting

Head of NBC Gives Views of Chain Programs in Harvard Address

Advertising Medium

Does Broadcasting Really Do What It Is Supposed to Do? —Impossible!

Merlin Hall Aylesworth, president of the National Broadcasting Company spoke this morning before the students of the Harvard Graduate School of Business Administration at Cambridge on the subject "The National Magazine of the Air."

President Aylesworthy's talk was a most carefully prepared historical treatise on the development of radio broadcasting. He said:

The story of broadcasting is the story of an experiment which became an art, and an art which became an industry. The transition from mere experiment to permanent institution, was an astonishingly rapid one, and posed a question which demanded a supremely rational and intelligent solution: Who shall pay for broadcasting? In answering this question, we have uncovered not only the economic solution of the broadcasting problem, but also a new and virile force in public relations, and a potent medium of supplementary advertising which offers untold possibilities to the industrialist of today and tomorrow. A new day, indeed, is dawning in the realms of commerce, industry, and national affairs.

Before we discuss present-day broadcasting activities and their import, however, we must turn in retrospect to the obscure beginnings of the broadcasting art, in order that we may be in a better position to appreciate and appraise what has been done.

Radio Telephony

Radio Telephony, originally developed for private, point-to-point communication, proved itself a glorified party-line. Everyone who wished to listen in might do so. Furthermore, due to the common medium employed, it was soon found that there was room only for a very limited number of channels.

Prior to 1920, various amateurs had undertaken experiments in the field of wireless telephone transmission. Among these was Dr. Frank Conrad, an engineer of the Westinghouse Electric and Manufacturing Company of Pittsburgh. Conrad, experimenting with a wireless telephone transmitter, sent out crude programs featuring phonograph records in addition to the usual voice transmission.

Mr. H. P. Davis, the vice president of the Westinghouse organization, sensed the enormous possibilities of this medium for mass communication, and public service, inaugurated a regular broadcasting service by a radio telephone transmitter installed at the Westinghouse plant. Thus came into existence that station which has become famous as KDKA, first introduced with the broadcasting of the presidential election returns of 1920, KDKA was followed by other broadcasting stations which sprang up like the proverbial mushroom in our various centers of population.

The radio audience which, in 1922, was a scant 100,000, had increased to several millions by 1924. And with increased size, had come discrimination. Having outgrown the pristine thrill which always attaches itself to the novel, it became base and insisted on genuine entertainment. It was no longer willing to waste its time and power on amateur talent, but came to expect of the broadcasting station the same quality and perfection of entertainment which the stage and screen were wont to furnish. Then, too, the financial perquisites of broadcasting vogue as part of the modus operandi of toll broadcasting.

It soon became apparent that the nation-wide organizations which had taken up this new medium for catching the public ear, were desirous of reaching, not only listeners within the range of the New York city station, but those in other metropolitan areas as well. It was therefore but natural that the American Telephone & Telegraph Company, equipped as it was with the requisite telephone line facilities for linking scattered stations toegther, should introduce network broadcasting when the demands of the advertisers warranted such a procedure.

The network broadcasting system of the American Telephone & Telegraph Company, with WEAF for its key-station, enjoyed a remarkable growth. Soon it covered New England; then it reached southward into Philadelphia and Washington; and west through Buffalo, Pittsburgh, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, Davenport, Minneapolis and Kansas City. This group, at the time the National Broadcasting Company purchased WEAF and assumed the management and operation of the existing network, comprised approximately 3600 circuit miles of special telephone lines, with Boston, Hartford, Providence, Worcester, Philadelphia and Washington linked by permanent wire facilities, while the remainder of the stations were on a temporary wire basis.

Late in the year 1926, the National Broadcasting Company was organized by the General Electric Company, the Westinghouse Electric & Manufacturing Company, and the Radio Corporation of America. The new company purchased Station WEAF, which, incidentally, is the only broadcasting station owned by the National Broadcasting Company today.

Early in 1927, the National Broadcasting Company assumed the management and operation of stations WJZ in New York city, and WRC in Washington, both of the Radio Corporation of America, together with a considerable network which had been built up by that organization in collaboration with its associates, the General Electric Company and the Westinghouse Company. With WJZ as the key station, this group became known as the Blue Network, offering an alternative program in virtually the same territory as the Red Network. This was followed by the formation of the Pacific Coast Network with seven leading stations receiving service from San Francisco.

The National Broadcasting Company was established with the two-fold purpose of sustaining interest in broadcasting, and insuring the permanence of the infant radio industry. It was keenly alive to its responsibilities to the American public which had invested millions in radio equipment, believing broadcasting to be a permanent institution.

Sponsored Program Help Economics

The sponsored program has helped to solve the economic problem of broadcasting. It has developed broadcasting from an experiment to a legitimate branch of advertising and publicity whose manifold possibilities are capable of great development.

Having determined what broadcasting can do for the sponsor, let us examine a still more pertinent proposition, to wit: Does broadcasting really do what it is supposed to do?

The accurate analysis of so intangible, so impalpable a thing as a radio audience, might seem, at first blush, a wellnigh impossible task. There are so many variables, so many things beyond the pale of normal existence. Yet we have succeeded in solving the problem and resolving it into understandable factors. Thousands of questionnaires, intimate contact with local newspapers, and statistical procedure applied to census figures, have given us a reasonably accurate cross-section of the radio audience.

It is estimated that each broadcast receiver serves an average audience of five persons. In addition, a conservative estimate places the average reliable service range of each of our network broadcast stations at one hundred miles. Again there are approximately seven million receivers within the effective range of our Red, Blue, Pacific and supplementary networks. Thus, the total audience available through our networks would be in excess of 30,000,000 if every receiver were tuned in on our program.

The ideal daily broadcast program, like the ideal magazine, should be of sufficient variety to interest the largest possible number of people. Although the

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The radio public of this country owes a sincere debt of gratitude to the American Telephone & Telegraph Company. To this organization must go the credit for the organization of network broadcasting to a group of radio stations through the use of wire facilities equipped for the purpose. The Western Electric Company, in its capacity as one of the foremost producers of radio telephone transmitting apparatus, found itself in receipt of many requests for equipment from those desiring to broadcast. The fact that the air was already crowded to overflowing did not discourage these crusaders in the least. The American Telephone & Telegraph Company, through its close affiliation with the Western Electric Company, was in a position to sense the growing demand for broadcast transmitting facilities.

Must Have Wide Appeal

The broadcasting and publishing fields present a parallel altogether too striking to be ignored. Both the director of a broadcasting studio and the publisher of a national magazine are faced with a problem which is basically the same, although its denouement is, of course, totally different. In order that he may sell his magazine to as wide a public as possible, the editor must see to it that his editorial content, or text matter, is of high quality and wide appeal. Now the broadcaster is in the same situation. It is only when, through the intrinsic excellence of his programs, he has built up a clientele, or radio audience, that he can sell his "space," which happens to be time, to those who wish to come before the public with a message, a product or an idea.

Station WEAF, in New York city, establishing at the very outset of its career the highest form of efficiency and artistry in its programs, commanded a far greater public than any new station could possibly aspire to. And now, "space" or time on the WEAF programs, which had become a national institution, was being offered to those who had expressed a desire to engage in broadcasting on their own account. Thus the idea of toll broadcasting came into being, marking a definite step forward in the economic solution of the problem.

The first commercial feature undertaken by WEAF took the form of a ten-minute talk under the auspices of the Queensborough Corporation, a realty organization interested in the development of Jackson Heights in Long Island City. Talks, at that time, still bulked large in the radio program, for the listeners had not reached the degree of sophistication where they fought shy of those in favor of music from another quarter. It soon became painfully apparent, however, that these talks, unless they were on subjects of absorbing interest, were poor broadcast material. Accordingly, good music, sponsored by the organization seeking good-will and recognition, came into possibilities are capable of great development.

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The ideal daily broadcast program, like the ideal magazine, should be of sufficient variety to interest the largest possible number of people. Although the publisher cannot expect to make a magazine that pleases everybody, nevertheless he confidently expects to have at least one article in each issue which will meet with universal approval. Likewise the broadcaster must adapt his program to the widely divergent tastes of the radio audience.

It is often asked whether broadcast advertising can include enough copy to do a good selling job, thereby justifying the not inconsiderable expenditure it involves.

It is quite generally admitted that 85 per cent of all the sales are made because the public has a previous acquaintance with the product involved. The American public has accustomed itself to buying definite brands, products, reputation or prestige. Furthermore, an analysis of modern merchandising discloses that 85 per cent of all goods sold owe their popularity to the prior creation of a desire in the public consciousness for the product. This desire ultimately blossoms forth in the form of actual purchase.

In the field of advertising, these conclusions have been quite fully substantiated in actual practice. Copy is being condensed, intensified, "high-powered," if you will. In the rush and whirl of modern life, advertising must tell its story as quickly, as concisely, and as intelligently as possible. Broadcast tempo, therefore, is quite in keeping with mod ern advertising trend.

Broadcasting is a great co-ordinating factor. No comprehensive scheme of national advertising is complete wtihout it. Broadcasting, however basically indirect in nature, can never supply "Reason Why" copy. This is the province of space advertising, which must always form the sound basis of the campaign. But broadcasting can do much to stimulate interest in the product and to help to more completely sell the space copy appearing in newspapers and magazines. Presentday trend is towards the fullest co-operation between broadcast advertising and space copy, each emphasizing and complementing the other. Many broadcast advertisers are merchandizing their programs with quite as much thoroughness and care as they merchandise their products or recall their magazine advertising in reprint form.

My address on the subject of sponsored broadcasting has necessarily held me to the business development of the National Broadcasting Company, and to our relationship to fifty-two associated stations. Scattered throughout the United States, these associated radio stations are connected by wires of our system.

With the exception of WEAF, owned by the company, and WJZ and WRC, managed by us, these radio stations are independently owned and operated. The service of the National Broadcasting Company and sixty or more national industrial institutions, may well be compared to the Associated Press, the United Press, the International News Service and to the city newspapers.

These associated radio stations have the full power to accept or refuse the programs of the National Broadcasting Company or our national sponsors.

EVERYDAY INVESTMENTS

Radio Corporation an Outstanding Commercial Development—Practically Every Industry Has Benefited From Company's Progress.

By ALBERT K. ETTLINGER

By The United Press.

New York, March 24.—Few industries have enjoyed as rapid development as the radio business and in the spectacular advance in the price of Radio Corporation of America stock one has ample evidence of the significance of this new American industry.

Such feverish buying activity has been known to accompany the rapid progress of other great discoveries in the past. This corporation, by reason of its strategic position in control and operation of important elements of the industry stands out as the natural leader.

Radio Corporation occupies the same position as General Motors and in other respects the radio industry may be compared with the automobile industry, according to the firm of Frazier Jelke & Co. which has just made a survey of the situation. Both have obtained a tremendous hold upon the imagination of the people. Both provide a luxury within reach of the average family which gradually becomes a necessity in the standard of living. Where the motor car revolutionized transportation the radio is making radical changes in the transmission of thought.

"Radio is less than ten years old. In the industrial sense it is entirely a post war development," says this house. "Before the war the practical uses of this art were confined to wireless telegraphy. The industry appears to have grown faster than it has been possible to coordinate its achievements to social usage, however.

"Two years ago the entire industry seemed to be facing chaos. It still is troubled by delays in arriving at settlement of important patent suits and in formulating satisfactory regulations for control of wave lengths. Due to its unique position, Radio corporation has held the leadership since the inception of the industry.

"Radio emerges now as a new and distinct economic force. Its influences are felt upon business as an advertising medium, upon production as a new market for raw materials and employment. It has become an aid in the dissemination of news and information and in transportation through its application to air and water navigation. Radio is also being developed for uses in science and industries where it was never believed to have direct application. Synchronization of sight and sound, perfected by an application of radio, will help the motion picture industry.

"The power companies are certain to profit by the growth of radio reception in the homes. At the present time it is estimated that an annual revenue of $10,000,000 can be attributed to increased consumption of electrical energy throughout the United States due to radio.

"The manufacture and sale of radio sets to the public is the largest single factor in the entire business. During the past three years approximately $1,500,000,000 worth of radio sets and accessories were sold to the American people. With the growth of chain broadcasting an entirely new medium for national advertising has been created.

"The service of radio in communication is growing in importance. Today approximately 90 per cent of such business is conducted for public service. The radio industry provides a market for such raw materials as copper, aluminum, cotton, paper, hard rubber, glass, wood, coal tar products and other chemicals."

AMERICAN EXPORTER

Vol. 103 New York, August, 1928 No. 2

The History of Broadcasting

Radio's Amazing Development Since the First Large Broadcasting Station Sending out Programs Regularly was Installed Eight Years Ago

By H. P. Davis

Vice-President, Westinghouse Electric and Manufacturing Company

ATTEMPTS had been made, and some successful results had been accomplished, prior to the World War, in adapting telephonic principles to radio communication. Reginald Fessenden, probably the first to attempt this, broadcast a program Christmas Eve, 1906. Later, Lee DeForrest did the same in the development of his apparatus. No real service, however, was attempted or introduced of a character similar to that now known as radio broadcasting.

The Westinghouse Electric and Manufacturing Company, having extensive research, engineering and manufacturing facilities of a nature suitable for this branch of electric science, was requested by the British Government, shortly after the outbreak of the war, to undertake certain special work in radio.

THREE GOOD REASONS FOR BUYING A RADIO SET

This photograph comes from New Zealand, and it is a safe guess that no father who has seen it failed to buy a radio set for his children before the sun set.

This activity took form in several fields. One, however, was the development of radio transmitting and receiving apparatus, both telegraphic and telephonic.

Two transmitting and receiving stations were designed, equipped and operated during the war. One was located near its plant at East Pittsburgh, Pennsylvania, and the other at the home of Dr. Frank Conrad in the Pittsburgh residential district, a distance of four or five miles separating the two stations.

I was in charge of the Westinghouse Company's war activities. Dr. Conrad was then serving as one of my assistants and among other things was especially assigned to radio work to secure increased efficiency.

Dr. Conrad became very much engrossed in this work, and in characteristic manner began to do research, developing new ideas and making important advances in the art. As a result, a considerable amount of money was invested in this equipment and a large staff of experts organized in that department.

With the end of the war, the company found itself with this investment and organization on its hands, and the re-establishment of patent restrictions, most of which were adversely held, placed the company in a position of considerable difficulty in continuing this work.

In seeking a revenue-returning service, the thought occurred to broadcast a news service regularly from our ship-to-shore stations to the ships. This thought was followed up but nothing was accomplished because of the negative reaction obtained from those organizations whom we desired to furnish this news material service. However, the thought of accomplishing something which would realize the service referred to, still persisted in our minds.

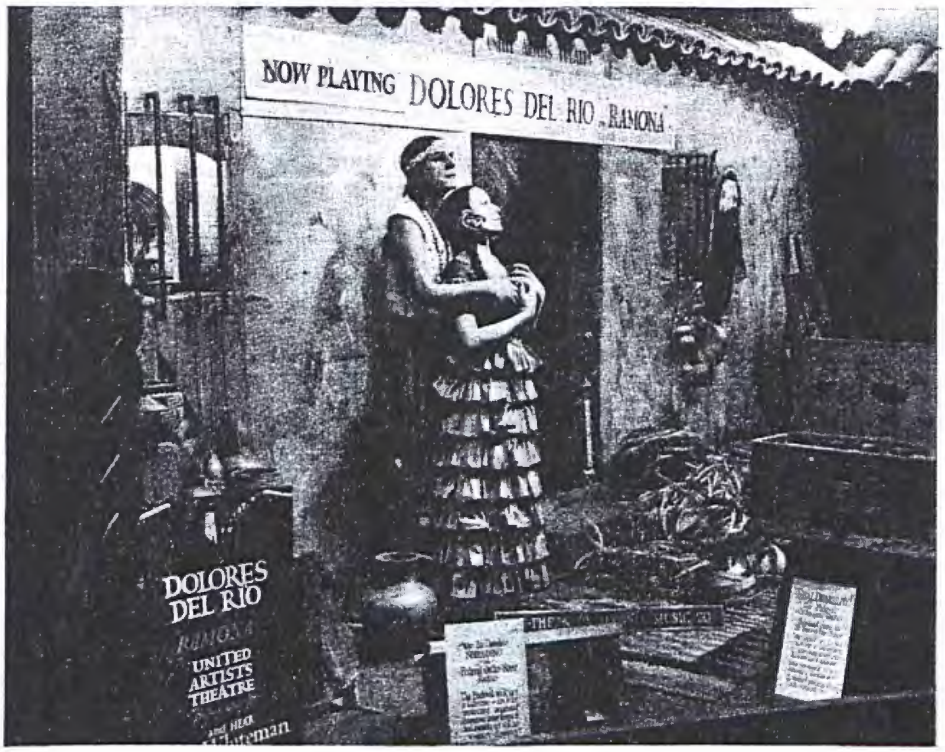
During this period Dr. Conrad had continued in his experiments with the station at his home and had greatly improved his radio telephone transmitter. Following the date on which Government restrictions were removed from radio stations, Dr. Conrad quite regularly had operated this radio telephone transmitter to send out interest-

ing programs of one kind or another, and to such an extent that people with receiving sets became sufficiently interested to listen to his station.

The program material available to him was largely phonograph records, although there were some talks, baseball and football scores.

We watched this activity very closely. In the early part of the following year the thought came which led to the initiation of a regular broadcast service. An advertisement of a local department store in a Pittsburgh newspaper, calling attention to a stock of radio receivers which could be used to receive the programs sent out by Dr. Conrad, caused the thought to come to me that the efforts that were then being made to develop radio telephony as a confidential means of communication were wrong, and that instead its field was really one of wide publicity. Right in our grasp, therefore, we had that service which we had been thinking about and endeavoring to formulate.

Here was an idea of limitless opportunity if it could be "put across." A little study of this thought developed great possibilities. It was felt that here was something that would make a new public service of a kind certain to create epochal changes in the then accepted everyday affairs, quite as vital as had the introduction of the telephone and telegraph, or the application of electricity to lighting and to power for domestic and industrial use.



RAMONA, RAMONA, DA DA DA!

The California Music Company at Los Angeles, distributors for Federal sets, arranged this clever and life-like window display, capitalizing the cinema and the waltz that are so popular.

Resulting from this was the decision to install a broadcasting station at East Pittsburgh and to initiate this service. This decision was made early in 1920, although it was not until fall that the equipment was ready for operation regularly.

It happened that 1920 was the Presidential election year, and the happy thought occurred to us to open our station on the night of the election returns and to broadcast this news. The result was the historical broadcast by KDKA of the Harding election.

A broadcasting station is a rather useless enterprise unless there is someone to listen to it. Here was an innovation, and even though advertised, few then, other than possibly some of the amateurs who had receiving sets, could listen to us. To meet this situation we had a number of simple receiving outfits manufactured. These we distributed among friends and to several of the officers of the company.

After nine months of continuous operation of Station KDKA the Westinghouse Company opened WBZ at Springfield, Massachusetts, in September, 1921; followed on October 12, 1921, by WJZ at Newark, New Jersey, and on November 11, 1921, by KYW at Chicago, Illinois.

It was not until the summer of the next year that any other stations of prominence were placed into operation, and very few then, as it was a considerable time later that the great rush for wavelengths took place and the confusion introduced that now exists in the broadcasting wavebands.

Our first broadcasting was from a rough box affair upon the roof of one of the taller buildings at the plant, which still stands there although no longer in use, and the development of the broadcasting studio is an interesting story.

In the first few months of operation of KDKA program material was drawn largely from phonograph records. It was recognized almost immediately by us, however, that no great interest or progress in broadcasting service would be possible if material differing from this type of entertainment were not available. The Westinghouse employes have always had a number of musical organizations, among them a very good band. We decided to broadcast this. Later, we organized the KDKA Little Symphony Orchestra.

Our phonograph was operated in the room in which the transmitter was located, and the announcer and others who had taken part in the programs up to this time also had been using this room. With larger aggregations of talent, however, it was necessary to seek bigger quarters, so one of the auditoriums at East Pittsburgh was put into use.

We immediately had difficulty in obtaining fidelity in the broadcast, due, apparently, to room resonance. To correct this we thought of placing the band in the open air and to transmit from out-doors. When this was done the result was a marked improvement. We saw at once that if we wished to accomplish good sound reproduction, specially designed rooms would be required to broadcast from—but how was not clearly apparent, and, in addition, the expense incident to it was a serious problem.

As the warmer weather was approaching we decided to broadcast our artists from this open-air studio which, as before stated, was on the roof of one of the taller buildings at the plant. For protection we erected a tent. This proved good, and everything went along satisfactorily during the summer and early fall, until one night a high wind blew the tent away—and so our first studio passed out and into radio history.

Necessity has always been the mother of invention, and having managed to keep our service going for nearly a year we could not think of discontinuing it because we had no studio—but we saw that we would have to go indoors. We therefore decided to try the tent inside. Part of the top floor of this high building was cleared and the tent "pitched" on this floor; and we were pleased to find that it worked as effectively as it had out-of-doors. Thus was the first indoor broadcasting studio developed.

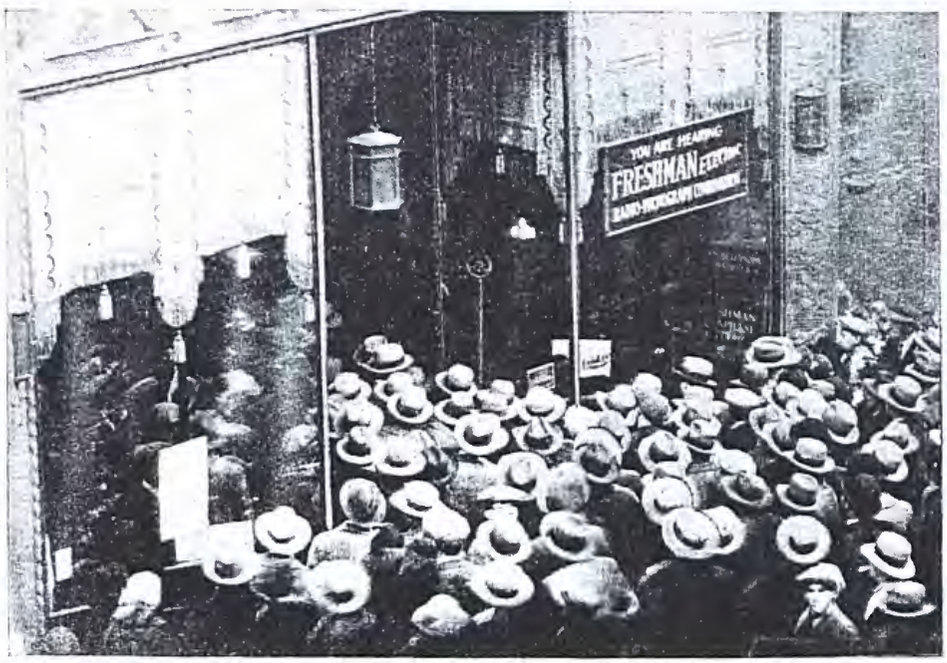
The subject of a specially constructed studio, however, was again revived and designs prepared for it. Taking the lesson of the tent to heart, we draped the whole interior of the new studio with the cheapest material we had available—burlap. We had now all the elements of the present studio as it is now equipped.

The principles that were originated by our experience have governed the design of the present-day studios, but the lowly burlap has changed its name to the more dignified name of "monk's cloth." Other materials, however, have been developed in this intervening period, and the walls, ceilings and floors of studios are now built of materials which are non-resonant in character so that the use of monk's cloth is required less than it was formerly.

Radio broadcasting became a conversational topic as universal as the weather, and the spell of it became world wide. It is probably a fact that when the response came, no facility or service ever received such a reaction from the public or grew so fast in popularity, when the public was awakened to what it really was and its possibilities.

Thus was radio telephone broadcasting born—a new public service; a service for the benefit or entertainment of anyone who might possess even the simplest receiving equipment. The secret of the success of the enterprise lay in the fact that there were then no interfering stations, and

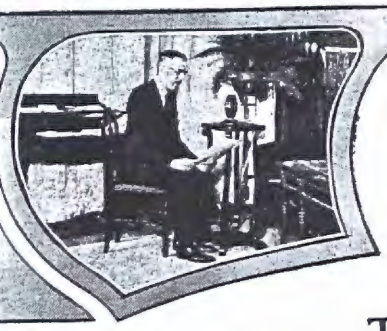
(Continued on page 83)



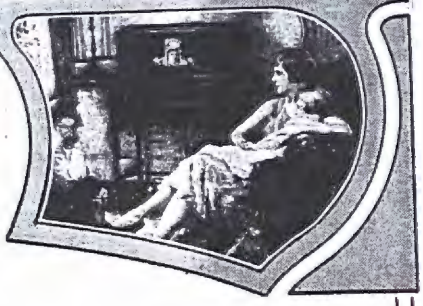
A STUDY IN CONTRASTS

Above: John H. Wooley, Atwater Kent dealer in Port-au-Prince, Haiti, and a buyer who is taking his new set off to his home in the hills. Below is a view of Landay's, one of the leading radio and phonograph stores in New York during a unique publicity plan on behalf of the Freshman set. A microphone was used with a radio and electric phonograph to personalize famous artists and to demonstrate the tone quality of the set.

Radio Section



Receiving Sets, Tubes, Loud Speakers, Head Sets, Batteries, Battery Chargers, Battery Eliminators, Accessories and Parts



The History of Broadcasting

(Continued from page 11)

because of this only very simple receiving sets were required to "listen in." This was fortunate, as there was nothing else, and the available sets were cheap. Being telephonic, the communications could be understood by everyone. They required no translation and were substantially unlimited as to the character of the subject-matter that might be transmitted and received. In addition, there was the marvel and fascination of listening to messages received out of space with very simple and inexpensive apparatus.

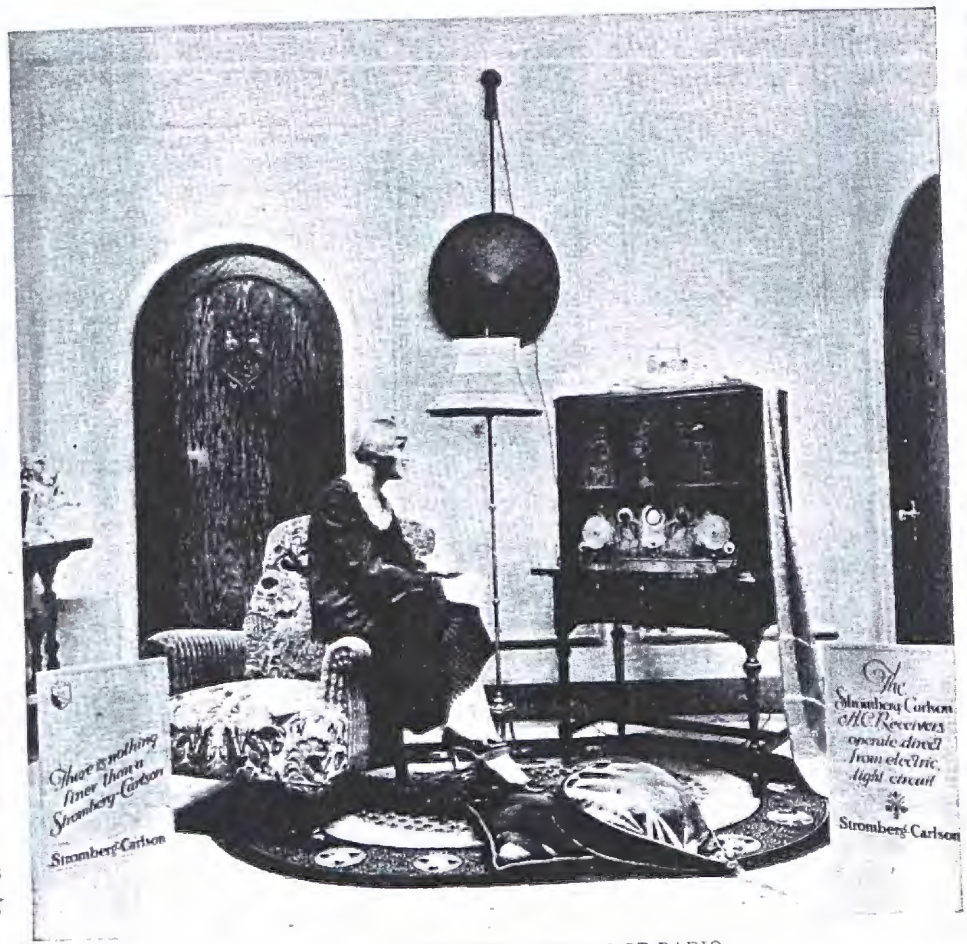
The first real pick-up service ever attempted was that of the services of the Calvary Episcopal Church of Pittsburgh. Here, again, is an interesting story.

We had been sending out originally, as previously indicated, music and entertainment from phonograph records, and as we had determined to broadcast every day we naturally included Sunday. Our week-day form of program material did not seem quite suitable for Sunday evening purposes. Accordingly, we had a discussion about the matter and the happy suggestion was made—"Why not try to broadcast a church service?" But how?

After consideration of the difficulties involved, especially in picking it up, a plan was worked out which we felt would make the technical part possible.

On January 2, 1921, the daring experiment was made of broadcasting the services of Calvary Episcopal Church. This was successful, and was so well received that it became a regular feature.

KDKA then rapidly developed and presented a series of "firsts" in broadcasting history. Among these "firsts" was the re-transmission of Arlington Time Signals at 10 o'clock nightly. The time signal service in-



AN UNUSUAL WINDOW DISPLAY OF RADIO

Nine out of ten persons — by actual count — who passed this window, used by a Stromberg-Carlson dealer, stopped to look at it because the home setting was especially good and the wax model so lifelike.

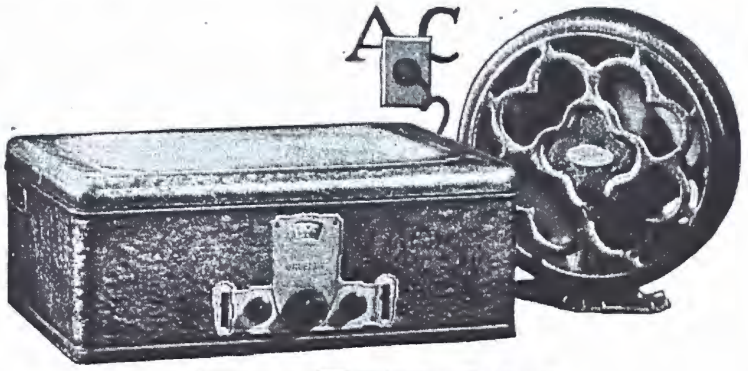
CROSLEYRADIO

New Crosley Radio Receivers

JEWELBOX-704

The electric model uses the new R. C. A. or Cunningham tubes, and Power Converter for A. C. current, 110/125 volts, 25/60 cycles, or 220/240 volts, 25/60 cycles.

The electric model is cased in a handsome frosted crystalline cabinet with gold finish, and the power converter is included in the cabinet with the receiver, making a completely assembled unit.



The JEWELBOX

This all electric model is completely assembled, the power converter and the receiver being in one cabinet.

BANDBOX-601

This circuit is absolutely balanced and the radio-frequency stages are completely and perfectly neutralized.

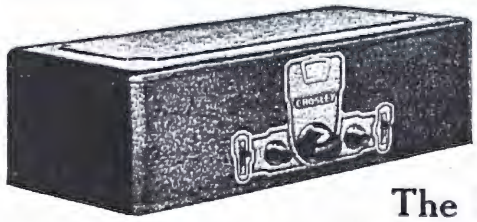
The set is completely shielded; coils in individual copper housings, and the condensers and wiring shielded from other elements.

Single master station selector with supplementary acuminators for sharper tuning. The single dial is electrically illuminated.

IMPROVED MUSICONES

Musicones match Crosley Radios. This is the favorite Loud Speaker for all radio sets. The actuating unit is specially adapted to reproduce sound without distortion of any sort.

Musicones are built in two sizes: 12 inch and 16 inch size of cones, and also in a new design as pictured above.



The BANDBOX

This attractive table model known as the "Bandbox" is in a beautiful frosted crystalline metal case and can be easily removed for installation in any type furniture cabinet.

Write Dept. 203 for descriptive literature.

Cables:
Listenin,
Cincinnati

The Crosley Radio Corporation

Cincinnati, Ohio, U. S. A.

Foreign Department

Codes:
Bentleys
Western Union
5-Letter

oduced a few days after the start of KDKA became at once, and has so remained, one of the most popular and appreciated of radio features.

After the time signals, KDKA introduced the first sports events by broadcast, the occasion being a boxing contest between Johnny Ray and Johnny Dundee, held in Motor Square Garden, Pittsburgh, April 11, 1921. Both boxers, I might add, have long since retired.

Next, on May 9, 1921, KDKA broadcast from the stage of the Davis Theater, in Pittsburgh, the first theatrical program in history. On August 4, 5, 6, 1921, KDKA first broadcast tennis matches, the occasion being the Davis Cup matches, held at the Allegheny Country Club, Sewickley, Pa., about twenty-five miles distant from the transmitting station. On August 5, 1921, KDKA transmitted the first play-by-play account of a baseball game held in the National League Park at Pittsburgh.

KYW's first program was an auspicious one, it being the transmission of Grand Opera direct from the stage by artists of the Chicago Civic Opera Company. This program was the pioneer of the many delightful operatic programs which we have enjoyed in the past and which, I am happy to say, are still a tremendously interesting feature of chain hook-ups.

Story of Farm Service

In the efforts to develop a diversified program the agricultural population, of vast importance to any agency attempting to interest all of the people of the United States, was not overlooked. To the contrary, it is another striking instance of KDKA's pioneering that the station was the first to conduct a regular farm service, which included not only livestock, hay and grain reports, but also weather forecasts. On May 19, 1921, KDKA was authorized to broadcast Government market reports and immediately began this service. Since that beginning, market reports which from time to time have been expanded in scope, have been a nightly feature of Westinghouse broadcasting stations.

We soon found that training announcers in diction and pronunciation was necessary, since for every mispronounced word we were certain to receive many letters of criticism. This condition prompted us to start an announcers' school, under the capable direction of T. H. Bailey Whipple, our literary critic, who held daily rehearsals of the various announcements to be made.

Most opportunely for us, we were able to secure the services of Miss Marjorie Stewart who, although blind, wrote daily constructive criticisms of all programs, pointing out where improvements might be effected. She thus became the first radio critic, and due to her exceptionally keen perception false notes in our broadcasting, exceedingly difficult for the program manager to detect before delivery of the actual program, were eradicated.

Feel Public's Pulse by Letters

We continually felt the pulse of the public through the thousands of letters sent to us, to determine their wishes in program arrangement. Some of these early letters were very interesting and instructive, and because of them we were from the very first let to maintain a high standard not only in musical offerings but also in the lectures, addresses and other forms of program.

It was very soon discovered that the characteristics of the microphone were quite different from those of the human ear. The microphone responds to certain frequencies more readily than to others. Consequently, a grouping in a studio that would be satisfactory to the ear direct might not be at all pleasing when heard over the radio.

Musical tones vary in pitch from the lowest tone on the piano, which produces twenty-seven vibrations per second, to the highest tone of more than four thousand vibrations per second. These fundamental tones are superimposed by higher harmonics which determine the nature of the tone produced, which make it possible to distinguish between the violin, flute, clarinet, trumpet, etc., or the most complicated sound, which is the human voice.

To provide a means of control, a modulation meter calibrated from 1-100 was devised. This instrument is now standard equipment in every transmitter. It is used to study the effect of different kinds of music or frequencies upon the current in the modulating tubes—an important factor that determines the quality of broadcasting. Over-modulation causes distortion, and under-modulation gives too weak a signal, difficult to reproduce clearly on the receiving sets.

On the basis of data compiled on a large number of observations and careful checking of the music as actually produced in the studio, and the results obtained on a receiving set, a series of charts was worked out by A. G. Popcake, one of the Westinghouse Electric & Manufacturing Company's engineers, showing the proper location of soloists and piano, also the proper grouping of instruments of various combinations, as quartets, orchestra, band, and so forth.

Chart Studio Acoustics

Of course, these charts were related to the acoustics of the studio and also to the type of microphone used. For this reason, as the art progressed, it was necessary to make changes in the placing of artists before the microphone.

Greater distance from the microphone is now possible on account of the improvements that have been made in the microphones, and the amplifiers used.

This increase in distance has simplified the problem of the proper placing of orchestra, for example. In fact, the music in an auditorium can be picked up successfully with the regular seating of the orchestra by locating one or more microphones at the proper points.

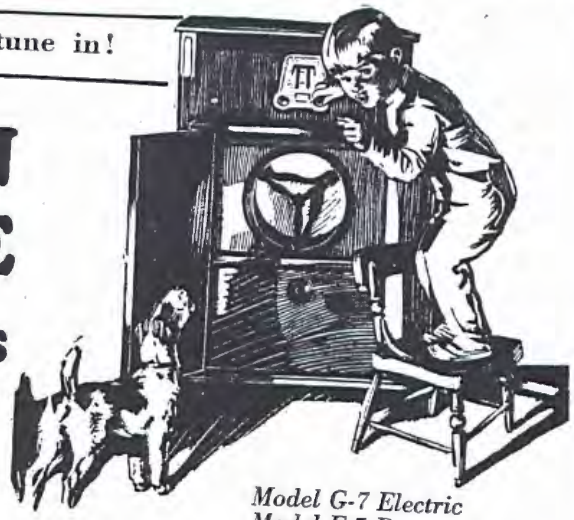
Short Wave Work

Meanwhile, KDKA was reaching out and pioneering in a branch of development of the radio art which now bids fair to be the most important in the science of communication. I refer to the work that the Westinghouse Company's engineers have done in short-wave transmission, and from which much is expected by radio engineers.

Early in 1922 we were convinced that there were wonderful possibilities which were being overlooked in the then unused and rather despised short-wave bands, considerably lower than those then in use for broadcasting

—so easy to operate that even a child can tune in!

FRESHMAN EQUAPHASE Radio Receivers



Model G-7 Electric
Model F-7 Batteries

fulfill every demand. In scientific exactness the Freshman Equaphase circuit excels. It is simple to operate yet accurate and sensitive to a fine point of precision and may be had for light-socket or battery operation.

A variety of cabinet designs adequately meet the requirements of present day homes.

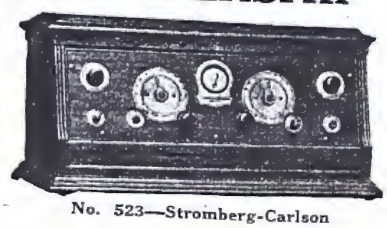
The ever increasing number of Freshman dealers and consumers the world over prove the permanency of the investment.

For further particulars apply

CHAS. FRESHMAN CO., Inc., *Freshman Building* **NEW YORK, N.Y., U.S.A.**

Cable Address: Freshcon—New York

STROMBERG-CARLSON LEADERSHIP



No. 523—Stromberg-Carlson

Because the Stromberg-Carlson Receiver has demonstrated quality of tone beyond compare, it has become the choice of people with musical discrimination everywhere.

For this reason the Stromberg-Carlson Dealer points with pride to the sign announcing him as an "Authorized Dealer." He knows that he can offer a Receiver which by virtue of its pre-eminence in tone quality, has become the standard by which all other receivers are judged.

For full particulars of the Stromberg-Carlson A. C. Line address the distributor nearest you.

STROMBERG-CARLSON TELEPHONE MFG. CO.
Rochester, N. Y., U. S. A.
Cable Address: "Stromcarl" Rochester

Distributors

Carr, Haynes & Cia., Agustinas 1041, Casilla 2769, Santiago, Chile, S. A. Emilio F. Wagner y Cia., Edificio Wiese, Esquina Nunez y Filipinas, Lima, Peru, S. A. Compania Stromberg-Carlson de Telefonos y Radio, Barranquilla, Colombia, S. A. Mr. Luiz Corcao, Caixa Postal 3028, Rio de Janeiro, Brazil, S. A.

Stromberg-Carlson

The New Valley A Power Unit *eliminates your storage battery*

Plugs into light socket and gives constant full L. T. power

This Valley "A" Power Unit (L. T.) replaces both the A battery and charger. To install, simply connect in place of storage battery. Contains no batteries, tubes or moving parts; makes no noise. [Power Unit (H. T.) may be pluged into back of A Unit to completely electrify set without making any changes.]

The Valley "A" Power Unit consumes current from the light socket only when set is in use. One switch on the Valley "A" Power Unit turns on both L. T. and H. T. Power. Not necessary to use switch on set.

Results are much more satisfactory than when a storage battery is used. Always an even flow of full strength current which gives clear, powerful reception at all times.

Mounted in handsome black enamel, satin finish case, complete with cord, plug and switch. Shipping weight, packed for export, 35 pounds.

Valley Electric Company
4515 Shaw Ave. - St. Louis, Mo., U. S. A.
Cable Address: VECO
Established 1914

Valley Electric

and for communication. An experimental station, known as KDPM, was installed at the Westinghouse Company's plant at Cleveland, Ohio, and serious work was undertaken between KDKA at East Pittsburgh and this station in an investigation of the subject of short-wave transmission and re-broadcasting. Since that time research and development work in this branch of the art have been carried on continuously and vigorously.

In the fall of 1923 the Westinghouse Company located a re-broadcasting station at Hastings, Nebraska, it becoming the well-known KFKX. At this point short-wave transmissions from KDKA were nightly received and re-broadcast on the station's assigned wave-length.

Great Britain Relays KDKA

On New Year's Eve, 1923, through previous arrangement, KDKA transmitted a short-wave program to Great Britain. This program was re-broadcast to British listeners through a station operated by the Metropolitan Vickers Company at Manchester, England, and was the first internationally broadcast program, as well as the first to be re-broadcast.

This work in short-wave transmissions led us to continue striving for distance. On December 12, 1924, KDKA's short-wave program was received and re-transmitted in Johannesburg, South Africa, by a newspaper there—The Johannesburg Star—and a few weeks later, January 25, 1925, we transmitted a program to Australia. This transmission marked the ultimate in distance transmission, since it was half-way around the world. Two days later our short-wave programs were received and re-broadcast in Melbourne, Australia, completing the record of our achievement. In every event so listed, the event marked the first time in history that such an achievement had been accomplished. The records show that KDKA's short-wave transmissions have been heard in every part of the world.

Far North Broadcasts

One important phase of the Westinghouse Company's broadcasting activities has been its so-called Far North Broadcasts, initiated through the foresight of George A. Wendt, of the Canadian Westinghouse Company, Ltd.

These programs now consist of a most fascinating list of letters from employes, relatives and friends of that band of adventurous folk whose lives are spent in small habitations, for the most part, above the Arctic Circle. The activities that resulted in the Far North Broadcasts began in the summer of 1923 when a number of short-wave receivers were distributed by the Canadian Westinghouse Company, to the Far North posts of the Royal Canadian Mounted Police. Because of the receiving sets we were enabled to transmit messages to them, at first by KDKA's short-wave transmitter, then later by means of short-wave transmitters of the other Westinghouse stations. As season after season of transmitting has been conducted, more and more of the companies operating posts in the north of Canada have supplied short-wave sets to their representatives, with the result that nearly all such places have radio receiving installations.

Among the companies which have so equipped their posts are the Royal Canadian Mounted Police, the Hudson Bay Company, the Revillon Freres, the Oblate Fathers, and others. To this host of listeners the Westinghouse stations each winter send a series of messages, most of which are of unique importance to those living out of reach of all civilization save that which comes to them from the ether. We have sent messages that have saved lives, rearranged winter plans, have caused heartache, and happy reunion—all over that great area starting from Greenland, in the east, thence over the coast of Labrador, and all the way across Northern Canada. These Far North broadcasts are among the most important things that broadcasting has ever accomplished.

The radio messages sent into the Far North were often the only communication those people had with the world for six months; it took often many months for the acknowledgments to reach us.

Pioneer in Synchronizing

Again, in later years, another pioneering step was taken. I refer to synchronizing. We were operating Station WBZ at Springfield, and another station—WBZA—at Boston. WBZA was necessary because the Springfield station, WBZ, could not be heard in certain sections of the Boston territory. WBZA, a small relay station, was installed in Boston to overcome this difficulty. At first it was operated on a different wavelength from WBZ, but it was realized that if these two stations could be synchronized and the program transmitted on a common wavelength from both stations, a much better distribution of the broadcast would be possible, and to the listener, of course, it would be as one station.

After some months of experimental work and development this was accomplished, and now for a considerable time these two stations have been run in synchronism with much more general satisfaction to the program listener.

Frequency Modulation

Another pioneering step occurred—this time at East Pittsburgh where KDKA had been operating for some time with a different type of modulation called "frequency modulation"—by means of which we are able to eliminate three-quarters of the number of transmitting tubes that are required in the ordinary manner of transmitting. Further, the wave band is greatly sharpened and eliminates side band interference. Much is expected from this innovation later.

Development of Radio Broadcasting in England

The development in England has been steady but has not gained the popular favor that radio broadcasting has received in the United States. In England a license is required to operate a receiving set, for which a fee is charged. In the case of transmitting stations, England decided that it would not permit unrestricted broadcasting but that a government controlled company should be formed in keeping with its announced policy. This company became known as the British Broadcasting Company, and erected a limited number of stations in Great Britain.

Next to England comes Germany in the popularity of

Machinery and Articles advertised in the AMERICAN EXPORTER can be recommended as Good Salable Lines for Foreign Markets

adio broadcasting. There are Government stations in all the principal cities, with one very high-powered one near Berlin.

French Pay One Franc Tax

The development of radio in France is very similar to that of Germany, with the Government in absolute control. There is a reorganization going on which will provide three national stations working in conjunction with eighteen district stations.

Besides the countries already mentioned, broadcasting has not gained a great foothold in Europe. There has been no great popular demand or enthusiasm for radio as has been experienced in the United States and Canada.

Australia and New Zealand are following England closely and are more enthusiastic over radio than most of the foreign countries. However, they also have restrictions which limit the number of stations, and a tax is collected.

In South Africa there is but little activity, and in China there have been many restrictions against broadcasting.

South America Follows United States

In South America the principal stations are in Brazil, at Rio de Janeiro, Pernambuco, Bahia, and Santos. These stations broadcast daily. In Uruguay there are three. Argentina possesses ten, eight of which are in Buenos Aires, and of the other two, one each is in Santa Fe and Rosario. Chile has several stations.

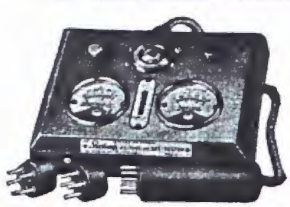
In South America the practice is similar to that in the United States—that of having advertisers sponsor programs and support transmissions. The receiving equipment in use in South America is nearly all of American design. In South America in particular the use of short-wave receivers is becoming more and more evident. We receive a large amount of correspondence from those countries and find that they, particularly in the tropical parts, where static is strong, make use of these short waves to receive from KDKA and WGY. The important sporting events, especially, from these broadcasts, are eagerly received by South Americans.

There are very few places on this earth that are not now acquainted with radio broadcasting—even in Eastern Siberia there is such a station.

A. C. Tube Tester

A compact and reliable tube tester designed especially to detect shorts and to show where the tube is shorted, has been added to the line of the Sterling Manufacturing Company.

This instrument locates shorts and shows emission; detects shorted amplifiers and rectifiers and is very handy for checking incoming stocks of tubes. It operates from 115-volt, 50-60 cycle alternating current, measures three inches by three inches by six inches in size, and weighs three and one-half pounds.



COMPACT TUBE TESTER
Designed to detect shorts and to show where the tube is shorted.

Philip Valk in Europe

Philip Valk sailed from New York recently for an extended trip throughout Europe. He will visit Rotterdam, Berlin, Denmark, Norway, Sweden, Finland and England, and return to Berlin and Rotterdam. From there he will go through all the territories on his way to Spain; from Spain to Italy, and then Roumania; from Roumania to Greece, and perhaps Turkey.

Mr. Valk is making this trip in order to exploit the field on the radio lines in which he is interested, namely: Auburn Button Works, F. R. Zierick Machine Works, Radio Condenser Company, Shamrock Manufacturing Company, Micarta Fabricators, Inc., K. and H. Electric Corporation, Saturn Manufacturing and Sales Company, Inc., Scanlan Electric Manufacturing Company, Mitchell-Rand Manufacturing Company, Alpha Radio Supply Company, Joseph Esserman, Varion Products Company, Klosner Radio Corporation, Bethlehem Radio Corporation, Essenbee Radio Devices Company, Standard Electric Novelty Corporation, Pal Radio Company, Cameo Record Corporation, Plaza Music Company, Crocker-Wheeler Electric Manufacturing Company, Kenneth Harkness, Inc., Case Electric Corporation and Bruno Radio Corporation.

Mr. Valk's address during this trip will be at the office of Willem Rood, Rechter Rottekade 117, Rotterdam, Holland.

Metallized Resistor Units

The metallized resistor has been worked out as a highly efficient product to supply the increasing demand for accurate, yet inexpensive units. Practically the same filament is employed in the usual receiver resistor or so called grid-leak type, and in the powerohm or power type, the latter being capable of handling 2.5 or 5 watts, depending on the size. However, because of the heat-dissipating properties of the protective tubing employed with the power type, a gain of approximately three times the current-carrying capacity, or ten times the power dissipating capacity is said to be obtained.

METALLIZED RESISTOR
For radio applications and electrical work in general.

Metallized resistors are employed not only in radio applications, but in electrical work in general and in particular in electrical laboratory practice. They are also finding a considerable use in X-ray and mercury-vapor light therapy apparatus, as well as in electro-therapeutic work, where high-frequency current is employed and non-inductive resistors are essential.

In the most powerful amplifiers, such as the Victor and the RCA auditorium amplifiers, the Durham metallized resistors, manufactured by the International Resistance Company, being non-inductive and permanent, are usually arranged in banks, of the required steps, with a switch to obtain the desired resistance, and are employed instead of adjustable resistors as they can be used without introducing distortion due to altered reactance.

Now Comes the Pocket Radio

A new pocket radio has been brought out by the Leon Lambert Manufacturing Company which does not use any tubes or batteries and works without any aerial or ground.

POCKET RADIO WITHOUT BATTERIES, AERIAL OR TUBES

This radio can be used effectively up to ten miles distance from any broadcasting station. It is shown here in use by Allen W. Hinkle, president of the Chamber of Commerce of Wichita, Kansas.

It simply is attached to a telephone or electric light and will work up to ten miles from a strong radio station and some users have reported hearing stations fifteen miles away.

Fada Appointment for Colombia

Upon his return from a South American tour, R. C. Ackerman, export manager for Fada radio, announced the appointment of Andres G. Jimeno of Barranquilla, Columbia, as Fada distributor for the territory tributary to Barranquilla, Cartagena, and the cities on the Magdalena River.

Mr. Ackerman reports that five broadcasting stations in the principal cities of Colombia are under construction, and will be opened shortly.

Home Television in Five Years

Dr. Lee De Forest says: "I am willing to go on record to the effect that practical, commercial, reasonably priced television equipment for the home will not be on the market within five years, and very likely not within twenty-five years. The most charitable view that can be taken to explain such headlines is that the authors thereof are carried away by their scientific enthusiasm." This statement was made in The Radio Dealer.

Pilot Radio Parts Awarded Medal

At the recent radio exposition held in Liege, Belgium, the "Medaille de Vermeil" was conferred upon a centraline condenser and Pilot-Lite dial manufactured by the Pilot Electric Manufacturing Company, according to a cablegram received from Martin Openshaw, sales manager of that company, who is now abroad.

Advertising Radio to the American Public

A Lecture Delivered Before the Students
of the Harvard Business School,
April 28, 1928

by

PIERRE BOUCHERON
Advertising Manager,
Radio Corporation of America

Perhaps no industry of modern times has enjoyed the immediate public acceptance that radio created for itself in the first few years of its life. Even such well known devices as the phonograph, the automobile, the telephone and the airplane pioneered many years before the public accepted them as practical and permanent accessories to modern life.

This quick response to the appeal of radio was due in large part to the fact that radio could bring to the home entertainment and information more quickly and economically than any other device known to mankind. Besides, there was the romantic appeal of being able to pluck all manner of music and speech out of the very air we breathe. Here indeed was the modern Aladdin's Lamp, the sheer magic of which readily caught the fancy of every man, woman and child, who first heard the strains of music and the voices of entertainers over the crude broadcasting stations of 1920 and 1921.

For these reasons, the radio industry did not face the problem of having to "sell" itself to a skeptical public. It did not have to engage initially in cooperative advertising and sales promotion campaigns that other less spectacular industries have had to employ in their pioneering

RADIO · DEPARTMENT

RADIO IN THE HOSPITALS

"HAVE YOU EVER BEEN ILL in a hospital?" asks Ward Seeley, in *The Wireless Age* (New York). He goes on to explain that he means just ill enough to be kept in your bed, not ill enough to be oblivious to your surroundings; and he recalls to your mind how bored and disgruntled you were, how slowly the hours passed, how you slept made in the new building for which the hospital recently secured funds. 'We want to do anything that will add to the patients' happiness,' said Dr. Savage, 'and radio will do it as nothing else can. I am very much in favor of it.' The hospital is located in the financial center of New York City, and its list of directors is an imposing one, including some internationally known names of prominent financiers. The expense of the radio equipment will be borne by the directors, who pledged their support after listening to a vigorous plea by Dr. Savage.

"Many of the Government hospitals in which are wounded and disabled veterans consider radio to be vital in improving the mental condition of their patients. The Fox Hills Hospital was one of the first to utilize radio, securing a Signal Corps set, and other hospitals in all parts of the country followed suit. The local posts of the American Legion in many cases raised the funds for the radio equipment. In El Paso, Tex., the Veterans of Foreign Wars only recently provided the William Beaumont Hospital there with receiving equipment.

"Probably there is but one handicap to radio from the doctor's point of view. That is the fact that the best and most interesting concerts are broadcast after eight o'clock at night. Several doctors told me that this was just the hour when they expected their patients to be settling for a long sleep.

"'Give us more concerts in the afternoon,' they pleaded, in substance. 'The phonograph records are fine, and they come over well, but the major interest is in the personal performances that take place in the evening. In many cases the effect on the patient is well worth an extra hour or so of sleep, but if that effect could be had in the afternoon instead of the evening it would be even greater.'"

PITTSBURGH'S BROADCASTING PIONEERS

AN ARTICLE in the *Radio Review* of the New York *Evening Mail* credits Mr. Harry Phillips Davis, vice-president of the Westinghouse Company, with being "the father of the present-day development of wireless, of the concerts on regular schedules, advance programs, the broadcasting of information of a thousand varieties, the marshalling of world-famed singers and artists behind the radio transmitters of great stations, and the consequent entertainment of millions of persons throughout the nation."

A BROADCASTING PIONEER.

Harry Phillips Davis, who saw in 1920 that the true field of wireless "would be broadcast communication and the entertainment of hundreds, indeed millions, of persons all over the country."

Mr. Davis has been associated with the engineering department of the Westinghouse Company since 1891, becoming manager of the department in 1908. Here is the account of the way in which he became interested in the broadcasting problem; and of the decisive action that led to the establishment of KDKA, at Pittsburgh, as the pioneer of present-day broadcasting stations:

"In September, 1920, radio was mainly the subject of scientific research and experiment. The devices and instruments necessary for transmitting and receiving wireless messages were not obtainable in the general market. There was practically no popular demand for them, and they were hard to obtain. Prior to the war interest in radio had been growing slowly, but the exigencies of the great struggle stifled it. But in September, 1920, Mr. Davis saw in a newspaper advertisement that Frank Conrad 'would send out phonograph records this evening' for amateurs. Mr. Davis envisioned then the future of radio.

"Mr. Davis pondered over the matter for several days. He saw that the true field of wireless for a long time to come would not be private communication, but broadcast communication, and the entertainment of hundreds, indeed, millions of persons all over the country. He saw that a station sending out entertainments, concerts, records of current events on regular schedules, was the key to the future. He believed that once such entertainment was broadcast, persons would demand 'ears' with which to hear it. He sent for Frank Conrad, who had been in charge of wireless experiments for the Government in Pittsburgh during the war. He succeeded in closing the Conrad station, and in November, 1920, put into operation, under direction of Mr. Conrad, the KDKA station at East Pittsburgh, as a broadcaster of programs of popular entertainment."

MEASURING INSTRUMENTS FOR THE RADIO AMATEUR

IN AN ARTICLE IN *Q S T* (Hartford), Mr. John H. Miller asserts that almost any amateur will find more interest in his work if he is able to measure the electrical quantity that he is using, and that the results will justify the use of instruments wherever possible. He especially cautions the novice to use care in handling the measuring instruments. They will stand a remarkable amount of rough handling, he declares, considering the delicacy of their construction, but if the best results are desired, the instruments should be treated with the same care and consideration that is given a fine clock or any other delicate piece of machinery.

Here are some practical points which, even if somewhat technical, should be of interest to every amateur who likes to have reasonably full knowledge of the apparatus he is using:

"It was recognized very early that when we wanted to measure current at a high frequency, ordinary electro magnetic instruments were practically valueless, since impedance became a determining factor in the readings and varied along with the frequency. Pure resistance necessarily had to be used if frequency variations were to be eliminated and about the only thing that a current in a pure resistance does is to heat it up. Heat then became a medium through which we could measure current of any frequency. Going further, we know that heat causes most metals to expand and this mechanical expansion we can cause to move an indicator over a scale graduated in amperes. Many ingenious methods have been used to magnify the slight expansion of the hot metal strip, but they are all essentially lever systems which increase the amount of motion until it is indicated on the scale of the instrument as amperes. This type of instrument has been highly developed by the Germans, and before the war practically all of the expansion type of hot wire meters were imported.

"A hot wire meter, while very valuable when nothing else was available, has a number of faults which we must recognize if we are to take such an instrument at its face value. It is frequently sluggish, and the pointer quite often refuses to return to zero, due to the permanent set of the expansion element. As the expansion element takes a permanent set and we return the pointer to zero by means of its adjustment, the ratios of the lever system are sometimes changed and we get a false reading when we again use it. The actual expansion of the metal strip is very small, usually only a few thousandths of an inch. In multiplying this expansion so that the pointer moves over several inches of scale we introduce a great many factors which are usually somewhat variable. The net result of these facts is that the expansion type of hot wire meter is liable to have glaring inaccuracies and to be unreliable.

"Another way in which we can utilize the heat developed in a resistance wire to indicate amperes on a scale, is to attach a thermo-couple, formed of two dissimilar metals, to the heating wire and measure the thermo-electric voltage generated on a standard D'Arsonval type of meter. The instrument which measures the direct current thermo-electric voltage may then be calibrated to read amperes flowing through the heater wire itself. This type of instrument is now being manufactured by the majority of reputable American instrument manufacturers

The Above Pages Were Taken from the Literary Digest and Are Representative of the Type of Publicity Given the Radio Industry During 1920, 1921 and 1922. Note the pertinent quotation in lower left column.

February, 1931

RADIO RETAILING

HOME ENTERTAINMENT MERCHANDISING

O. H. CALDWELL, *Editor*

A McGRAW-HILL PUBLICATION. ESTABLISHED 1925.

Less Than 3%

THERE is a good deal of talk nowadays about too much advertising on the air. Newspaper editors, columnists and people in the public eye have all pointed out the annoyance and irritation which the ordinary listener feels when he is assailed by a long, direct-selling announcement which breaks in on some delightful program.

Certainly it cannot be denied that there is truth in these charges. Some instances of direct advertising are so blatant, some small broadcasters send out such a continuous stream of paid announcements as to put a veritable blight on the good name of radio. Stations have even inserted local merchants' advertising announcements in the middle of great chain features. In one case when the President of the United States was scheduled to speak and a large audience was assured, those who tuned in heard instead a succession of three-minute local ads for shoes, men's clothing and restaurant food—after which the station switched on the last two minutes of the President's speech!

BUT in general, such criticisms as have been made relate to the smaller and less responsible stations, broadcasters who are "in radio for revenue only." They do not apply to the stations large or small which have a real sense of service and responsibility to their public. Above all, they do not apply to the programs of the great networks which are the backbone of radio.

For in the magnificent aggregation of program features which the great chains are supplying, the American public is enjoying such a combination of talent, ability and genius as has never hitherto been spread before it. Nearly twenty million dollars will go to the payment of broadcasting artists during 1931.

This splendid menu of entertainment, inspiration and information is spread before the listener without cost. And of the total time these programs are on the air, not more than three per cent is actually devoted to advertising announcements. Surely no listener can object to two minutes of advertising out of an hour's magnificent entertainment rendered by the world's great masters and leaders. Contrast this with the popular magazines, which are made up 40 per cent of reading matter and 60 per cent advertising—or with some of the recent movie programs where even 20 to 30 per cent of the films the theater-goer has paid to see, are not be led astray by current criticism.

THE better broadcasting channels as they are operated today present wonderful features and a continuous stream of enjoyment—"treasures of the night" that overwhelmingly overbalance the slight advertising encroachment which must be depended on to pay for the entertainment they give.

As things stand, any family which buys a radio set and tunes it in during 1931 will get far more solid enjoyment for the outlay than can be obtained from any other expenditure of the same money.

The public which is yet without radios must be made to understand this, and not be led astray by current criticism.

A radio set still remains the best buy that can be made with the 1931 entertainment dollar.

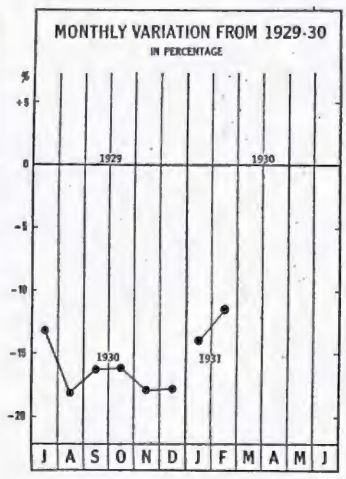
NEWSPAPER LINAGE BAROMETER

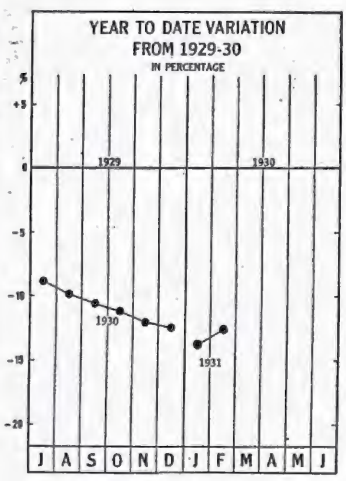
FOR FEBRUARY, 1931–1930

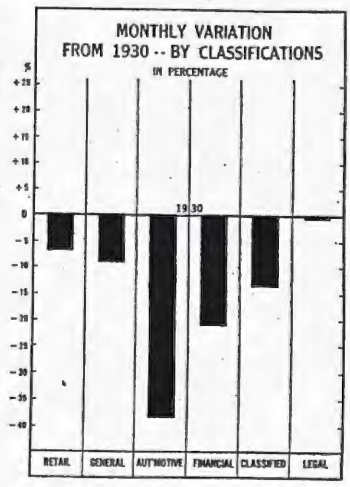
The rising tide-marks of newspaper linage are indicated on the charts and the map below, denoting graphically the advertising picture for the month of February and 1931 to date, as it appears in the volume of 235 daily and 119 Sunday papers measured by Media Records, Inc. The circles on the map, indicating the variation from last year's total, show improved conditions in February over January for 21 cities. The January map, it may be recalled, showed improvement in 24 spots over the December, 1930, figures. More than half the cities measured have therefore gained by cutting down their losses in the first two months of this year. The circle in the legend indicating "15 per cent loss to 5 per cent loss" should have its white sector opening upward rather than down, and the circles for the majority of cities on the map with this white sector opening upward, indicate the loss range from 15 to 5 per cent from February last year.

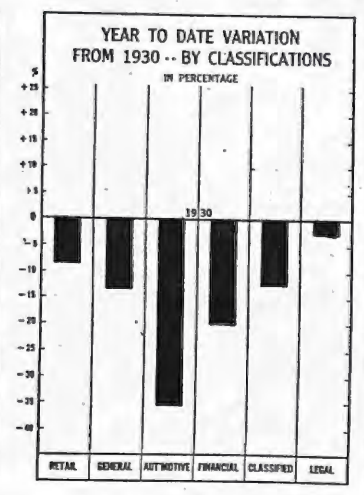
Two new charts, showing the trend in major linage classifications for the month and for the year to date, are introduced this month. It will be noted that with exception of automotive and financial linage, the other classes are within a short distance of their 1930 performance.

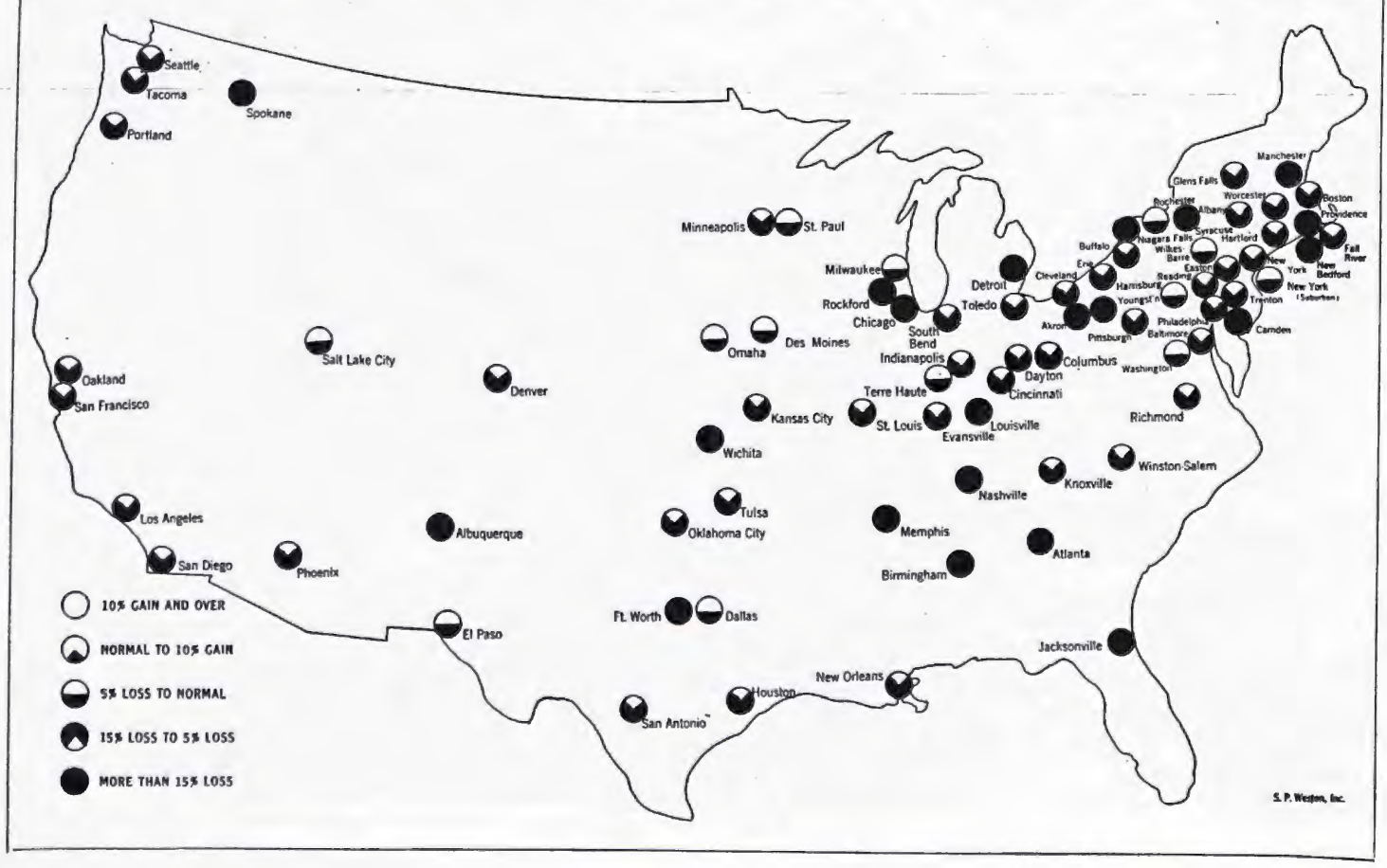
Charts and Map Prepared Especially for Editor & Publisher by S. P. Weston, Inc., Newspaper Engineer.
Linage Data Supplied by Media Records, Inc.











STATIONS TRYING TO REDUCE DIRECT ADVERTISING, AYLESWORTH SAYS

Sales Talks Limited to One and One-half Minutes in Each Half Hour on N.B.C. Chain, President States—Sees No Circulation or Advertising Menace in Radio

By JOHN F. ROCHE

RADIO and newspapers are looked upon as necessary adjuncts to one another in the field of advertising by M. H. Aylesworth, president of the National Broadcasting Company, who expressed his views on the relation of radio to the press in an interview with EDITOR & PUBLISHER this week. And in the realm of news coverage, Mr. Aylesworth considers the bulletins broadcast by radio stations as a benefit, rather than a drawback, to newspaper circulations. This fact is evidenced by newspaper owned radio stations, broadcasting news morning and night, he said. The N.B.C. president, in giving his views, declared that raido has contributed much to newspaper advertising columns, particularly through the campaigns of radio set and accessory manufacturers.

"Statistics show," Mr. Aylesworth said, "that the radio industry, and I speak of the manufacturers of sets and accessories, is the third largest national advertiser in newspapers. I would like to call attention to the fact that, if it were not for the National Broadcasting Company and others, there would be no radio industry advertising, for the set is worthless without the entertainment and information we supply.

"There are many more instances of increased advertising in newspapers on the part of concerns using radio time than there are instances of decreased newspaper campaigns because of the use of radio," Mr. Aylesworth continued. "Today national newspaper advertisers in practically every instance where they use radio, make one the complement of the other in their merchandising plan.

"Radio builds good-will for its sponsor who is also using newspaper space, but detailed copy carrying the price and picture of the product is essentially newspaper advertising, and in many instances the advertiser who uses radio calls attention to his programs in his regular newspaper merchandising copy. He does this to couple the two complementary forces into a co-ordinative selling power."

His discourse on advertising led Mr. Aylesworth to a discussion of radio programs as they are printed in newspapers.

"I have never contended," he pointed out, "that newspapers should use the name of a product as such in publishing radio programs or should permit any description of a product. I have always contended, however, that a program often becomes symbolical of the product and its sponsor, and therefore, I think, such names as 'Lucky Strike Orchestra' or 'Maxwell House Orchestra' identify a certain type of entertainment. The reader to whom these programs appeal relies on those names as identifying marks.

"In the case of Pepsodent program, for instance," Mr. Aylesworth continued, "I can see no reason for a newspaper printing other than 'Amos and Andy' in its program page. That title identifies the program for everyone."

The N.B.C. president thinks the publication of radio programs is a service newspapers should render to their readers who are also radio listeners.

"Eighty or 90 per cent of newspaper readers," he said, "listen to a radio some time during the day or night, and it is these people the editor serves when he prints programs and news of radio. It has been stated by some that program sponsors should pay for this service. This service is primarily for the reader, not the broadcaster.

"Professional boxing has never advertised in the newspapers, yet, if it were not for the very great support it gets in newspaper sport pages, there would be no financially successful boxing matches. Professional baseball gives very little advertising support to the press. Yet more news space is given to it than to radio, and it certainly cannot be said to be more interesting. College football and amateur sports receive more space, and yet they, too, create less interest than radio. The same, I believe applies to motion pictures and the legitimate theatre."

Mr. Aylesworth was asked if anything is being done to meet the growing tide of protest against lengthy and ever-increasing periods of pure advertising matter injected into broadcast programs by the sponsors.

"In N.B.C. programs," he replied, "there is never more than one and one-half minutes of straight advertising time in every 30-minute program. We tell our advertisers that the first purpose of their program should be to entertain and inform the audience. Trade announcements should be secondary and they should be brief and newsy. We have constantly stood for the policy that no client may unnecessarily interrupt a program for an announcement, nor mention price. The great majority of our clients have been on the air a long time, and they know what the public wants. As they become more experienced in radio presentation, they gradually reduce the amount of time allowed for announcements. But announcements, of course, will always be necessary. People don't buy goods from sheer gratitude. The sponsor must tell something about his products."

While not more than one-third of the available radio time is sponsored, Mr. Aylesworth said radio people realize, of course, that the sponsored time is mostly in the evening when a greater audience is assured.

"Nevertheless," he declared, "there is proportionately much less advertising on the N.B.C. than there is in a newspaper or magazine. Estimating conservatively, I should say 50 per cent of any newspaper is advertising space. There seems to be no objection to this on the part of readers, perhaps because newspaper advertising is more than merely paid space. It is a service to the reader, and it makes it possible to buy a paper for two or three cents instead of 25 or 50 cents. Sponsorship of radio programs makes possible the presentation of entertainment and information for the listener without cost other than ownership of a radio set and upkeep.

"In other countries," Mr. Aylesworth pointed out, "there is a tax on radio sets, which ordinarily means government monopoly and ownership. We in this country feel that we can perform a finer service to the listener through competition between sponsors, plus the broadcasting company's policy of editorial service, than would be possible through a government operated system with no competitive sponsorship by industrial concerns. The soundness of this theory is shown in the fact that there are 15,000,000 radio sets in the United States, or more than in all other countries."

The fact that the sponsors' trade announcements cannot be escaped by the radio audience, unless the radio is shut off, was called to Mr. Aylesworth's attention.

"While I might be told the newspaper reader does not have to look at the advertising in his paper," he observed, "he has to turn through the paper to pick up a continued article, and in doing so he is bound to see the advertising. The newspaper advertising, in that case, might be compared to announcements in the course of a radio program.

"I believe, however," he continued, "that the ear is so trained that it is possible for a listener to close his ear to monotonous copy on the radio and still enjoy the program without turning off his set."

The only interruptions permitted in radio programs are those caused by the necessity of broadcasting a spot news bulletin. These bulletins are supplied by Associated Press, United Press and International News Service and are supplementary to regular news bulletins put on the air by radio stations.

The National Broadcasting Company studios are equipped with the press association machines, Mr. Aylesworth said, and receive what news the editors think should be broadcast for the benefit of the public. It is his opinion that this service, rather than hurting newspaper circulations, is an agency of distinct benefit to the press. One of these benefits, Mr. Aylesworth asserted, was the elimination of costly "extras" which was made possible by spot broadcasting.

"Radio has attempted to report important public events," he went on, "and instead of decreasing newspaper circulations, we have evidence that such action has been followed by increases. This comes to us from newspapers owning radio stations and reporting events as they occur with printed stories following in later editions.

"It certainly never could be argued that 100,000 people attending the Yale-Harvard football game would decline to buy newspapers containing descriptions of the game. As a matter of fact, the person who sees the game is usually the first to want to read about it."

Apart from reporting major news events for which arrangements can be made beforehand, no attempt to cover spot news in newspaper fashion has ever been undertaken by the National Broadcasting Company, Mr. Aylesworth said.

"The N.B.C. has not even contemplated establishment of its own news services," he declared. "We are entirely content to rely on the bulletin supplied to us by the press associations. I think the radio listener is entitled to this bulletin service. Most stations owned locally have a tie-in with the local newspaper, and inasmuch as this service is voluntarily offered, I cannot believe it possible that either the newspapers or the press associations would discontinue it."

There is no question that newspapers have been a great aid in the progress of radio through furnishing news bulletins and printing programs, Mr. Aylesworth declared. News of radio has always been looked upon by him as a service to readers because of their interest in broadcasting.

"More people read the radio page more than any other but the front page," he said. "More people are interested in it than in any other feature. We receive more than 600,000 letters a month in this office, and because of this interest, we believe that information about radio entertainers and radio programs is legitimate news. Radio listeners are really interested in the entertainers and want to know what they are going to sing. On the other hand, because of this popularity, I think radio entertainers and radio programs should be treated by newspaper critics in the same fashion as motion pictures and stage shows are handled by movie and dramatic critics. The radio critic should judge a program entirely on its merits and not be influenced by the fact that an advertiser is sponsoring it. Neither should he criticize it unfavorably merely because it is commercially sponsored. The sponsors, too, should take fair criticisms in good spirit, and should not try to exert advertising influence on the critic's opinion. We also tell our clients they should not expect free news items in the papers because they are advertisers."

When a newspaper prints radio programs in full, telling what selections are to be played and sung, Mr. Aylesworth feels that there is just cause for complaint if a sponsor changes it when it goes on the air.

"The N.B.C.," he said, "is endeavoring to stop that practice. We have been concentrating on it for the last two years, and have found that one of the main reasons such things happen is that a sponsor finds that a program preceding his is going to play the same selections he has chosen. We cannot tell a sponsor what numbers his orchestra should play, but we do feel that, when he changes his program at the last moment, newspapers are entirely justified in eliminating his program selections from their radio pages."

WRITER WON SHAW QUOTES BY HOAX AT CAIRO

PERSISTENTLY pursued by newspaper reporters last week when in Cairo, Egypt, George Bernard Shaw closed his doors to interviewers, an A.P. dispatch said.

But a French reporter, unnamed in press dispatches, crashed through by scribbling on his card: "Einstein's nephew wants to shake hands with Shaw," and obtained from Shaw the following comment on "nudism":

"When one's body is so esthetically formed as mine, one likes the world to admire it. Nudity puts an end to the Darwinian quarrel, for when they are naked all humans look like gorillas."

When the eminent British author discovered the hoax he told the reporter he would be forgiven if he would play the same trick on Rudyard Kipling, who also was in the vicinity of Cairo.

LIBEL SUIT BASED ON "JUGGLE"

College Professor Asks Damages in Macon, Ga., Court

(*By telegraph to* EDITOR & PUBLISHER)

MACON, GA., March 25—College professors and business men of the city are trying to determine the meaning of the word "juggle" in the city court hearing of a libel action brought by Professor W. J. Bradley, member of the Mercer University faculty here, against the Macon News Printing Company.

Professor Bradley claims to have been libeled by the headline, "Allege Professor Juggled Funds" over a story involving a trusteeship for his brother. Certain expenditures were disallowed in the administration of funds.

The story itself is admitted to be a correct account of the court record, but the disallowance is said to be only technical, and involves no dishonesty on Professor Bradley's part, it is claimed.

TAX BILL REJECTED

North Carolina Committee Votes Against Proposal—Protests Heard

The house ways and means committee of the North Carolina general assembly has voted unanimously not to impose any additional taxes on newspapers. Publishers of the state appeared before the group to protest a proposed "newspaper tax."

Representative Ewbank, of Henderson, chairman of the sub-committee which had previously decided to favor a special newspaper tax, reported that his group was convinced newspapers of the state were not making enough money to assume any additional tax burden.

LaVARRE SUIT DROPPED

Non-Suit Order Signed in $2,500,000 Action Against I. P. & P.

The $2,500,000 damage suit brought against the International Paper and Power Company by William LaVarre, former publisher of the *Columbia* (S.C.) *Record* and three other newspapers in South Carolina and Georgia, was nonsuited March 18 in United States district court at Columbia, S.C.

Counsel for LaVarre agreed to the non-suit and the order was signed by Judge J. Lyles Glenn upon petition of an attorney for the paper company.

TO MARK ANNIVERSARY

The *Shenandoah* (Ia.) *Evening Sentinel* will be 50 years old April 1. C. N. Marvin, who started the Sentinel 43 years ago, is still active with the newspaper. Don McGiffin who consolidated the *Daily World* and the *Sentinel-Post* in 1924 is president. R. K. Tindall, managing editor and business manager, has been with the newspaper for the last 17 years.

5/10/61

* * *

H. P. DAVIS, the Westinghouse Electric Company vice president who helped make KDKA the country's first commercial radio station more than 40 years, was named to the Broadcasting Hall of Fame last night at a dinner of the Broadcasting Pioneers in Washington, D. C.

Davis, who was a Westinghouse engineer from 1891 until he died in 1931, was known as the "Father of Broadcasting." He supplied the business acument behind KDKA when it went on the air November 2, 1920, to report the results of the Warren Harding-James Cox election.

The late Westinghouse executive joins in the Hall of Fame 11 other broadcasting greats, including Dr. Frank Conrad, the technical genius who engineered the first, monumental broadcast. Dr. Conrad was named to the Hall of Fame in 1953.

MISS EDITH MORSE, who became Davis' secretary in 1915, recalled her boss was among the first men to recognize the public service advantages of broadcasting. She still oversees Davis' estate from a roomy East Liberty office crammed with clippings and memories of Davis.

"He was ten years ahead of his time," she recalled. She saw her boss appear on a tiny television screen, in the Westinghouse laboratories in 1928. He called it radio vision.

DAVIS BECAME chairman of the board of the National Broadcasting Company in 1926. By 1929, according to clippings in Miss Morse's collection, newspapers were predicting the World Series would go on television that fall. Davis poohpoohed the idea, of course.

He always wasn't a natural "no-man," however. His initials stood for Harry Phillip, for instance. But Miss Morse recalled the folks around the office called him "Horse Power."

* * *

NEW YORK TIMES

10 JUNE 1928

11

EXTENDS RETIRING TIME CITY AND COUNTRY FOLKS

Davis Says Broadcasting Is Changing of the People—Programs Keep Listens Up After "Chickens Go to Roost"

VISION is imminent, H. P. vis, Vice President of the stinghouse Electric and nufacturing Company, told onal Electric Light Associatheir meeting on June 5 at c City.

at does the future hold for For one thing, television," Mr. Davis. "While radio brings nly sound today, in our laboras sight transmission is an acplished fact. It only remains w to reduce it to a practical form make it available to the public. alking movies in the home is also st around the corner. At the start, his device will be actuated through the use of individual film records; later, as a service of the broadcasting station. Apparatus is now developed in practical form whereby a message or picture can be transmitted in facsimile form, in other words, as a typewritten page or picture. This is an entirely new and revolutionary system of telegraphic communication.

"This agency opens up other avenues whose development can be far-reaching. I conceive it possible, when combined with the Televox, to arrange a device for use as a broadcast receiver that will automatically take the message from the broadcasting station in facsimile form, in other words, as a printed communication.

"Today the radio industry gives employment to 320,000 people. Prior to the start of KDKA in 1920 the sales of radio merchandise were less than $2,000,000 annually. In 1927 they were approximately $500,000,000. In seven years, therefore, a business of $2,000,000,000 has been created. About 10,000,000 of the 28,000,000 homes in the United States are equipped with receiving sets. There are 680 broadcasting stations and about 40,000,000 listeners in the United States.

"Such has been the increase in the radio industry in the United States. It has been the most remarkable achievement in the industrial history of the world, and should furnish a sufficient answer, if such is necessary, as to the permanence of radio. In spite of this amazing development, we who take an active part in the industry believe the ground has hardly been scratched and even more wonderful advances and possibilities are at hand.

"Radio is 100 per cent. electric power consuming, and as such is of great importance to power companies. It has changed the habits of people to the extent that the average retiring hour in the city, formerly regarded as 10 o'clock, today is 11 o'clock and probably later, and in the country the average retiring time is 10 o'clock, rather than 'when the chickens go to roost,' as formerly. This change has resulted in a greatly increased use of electric lighting service, and thus radio has been the means of greatly increasing power consumption," said Mr. Davis.

"As a broadcasting service, radio opens up to the power companies an avenue of most intimate approach and enlightenment with the consumers. Radio broadcasting is especially effective because it forces an appeal to logic. It provides no opportunity for the spellbinder. Perhaps the greatest benefit that may accrue to light and power companies from radio is the improvement of our knowledge of electric phenomena, which will enable us to better understand the generation, transmission and control of electric power.

"Undoubtedly many special radio appliances will be developed. These will be for purposes of automatic supervision, automatic control, automatic inspection and sorting, automatic counting, automatic fire protection, automatic synchronization of machines and many other automatic operations.

"Any forecast of this kind would perhaps be looked upon as incomplete that did not carry some statement concerning the transmission of power without lines, that is, radio power. He would indeed be a foolish person who would undertake to say that this feat will never be accomplished, because in this marvelous art the impossible of today becomes the commonplace of tomorrow and things that now appear insurmountable may melt away in the sunlight of new discoveries that are ever being made."

Broadcast Advertising Topic of New Book by F. A. Arnold of Montclair

Local Man, Director of Development of National Broadcasting Company, Completes Study of Field.

Of interest to the radio industry is the announcement that "Broadcast Advertising, the Fourth Dimension," by Frank A. Arnold, director of development of the National Broadcasting Company, has recently been published by John Wiley & Sons, Inc., of New York.

Written by an advertising man, written from personal experience by one who has been a publisher, buyer of advertising, advertising agency executive and developer of radio broadcasting, this book is said to have [illegible] the man who wants authoritative facts which are first-hand and not a compilation from secondary sources.

"Broadcast Advertising" deals with everything from the pioneering days of radio to an interesting discussion of its future. Obtaining radio circulation, planning programs and adopting them to subject and audience, reaching the audience, the advertising agency and re-selling the broadcast program, broadcasting as an aid to distribution, does broadcast advertising pay—these are only a few of the subjects discussed which make the book valuable to advertising agencies, advertising departments of industry and staffs of broadcasting stations and organizations. It is also recommended as a textbook for supplementary reading in schools and colleges which are establishing courses in broadcast advertising.

No Waste Motion.

"'Broadcast Advertising' goes right to the point. There is no [illegible]ding, no wandering into irrelevant though interesting by-paths, no blaring of trumpets," according to the announcement. "Mr. Arnold has written a straightforward, honest and accurate interpretation of broadcasting as the 'fourth dimension of advertising.' His facts are first-hand, proved by actual experience and not a compilation from secondary sources."

Mr. Arnold was for twelve years president and general manager of "Suburban Life." He was an officer and director of the Frank Seaman Advertising Agency for nine years and resigned from that company in 1926 to assume his present position. For six years he was a committee chairman of the American Association of Advertising Agencies and vice chairman of its first radio advertising committee. He has given over 400 addresses on radio broadcasting in more than 200 cities by special invitation.

The late Harry P. Davis, vice president of the Westinghouse Electric & Manufacturing Co. in the foreword to "Broadcasting Advertising" says:

"Broadcasting advertising is modernity's medium of business expression. It has made industry articulate. American business men, because of radio, are provided with a latchkey to nearly every home in the United States. When visiting in America's homes by means of radio programs, they are only asked to conduct themselves as good-mannered guests. An attentive public ear is attuned to this distinctly unique method of public information.

Of Service to Public.

"The American public owes a great deal to those industries and businesses whose use of broadcast advertising has, for the individual citizen at least, provided without fee, instruction, entertainment and amusement. Night and day in our country, and in fact in all parts of the world, there is broadcast a panorama of events in which those who participate represent the highest and best attainments in their respective fields of endeavor. All this the public has come to expect, without expense, and at the turn of the dial. Broadcast advertising has been of vast service to the public.

"Frank A. Arnold, director of development of the National Broadcasting Company, Inc., is thoroughly qualified to discuss the many interesting phases of broadcast advertising. His entire business life has been devoted to publishing and advertising and he brings to this new art a background of practical knowledge which is unique. His experience in this newest form of business expression is reflected in this book, which is an important contribution to radio and business literature."

MONDAY, SEPTEMBER 22, 1930

Microphone

By S. H. STE

Pittsburgh will play leading roles in the Radio World's Fair, opening at Madison Square Garden tonight. Dr. H. P. Davis, "father of broadcasting," and Dr. Frank Conrad, who experimented with radio for years before it became a reality, will speak. Dr. Davis is vice president of the Westinghouse Company and chairman of the board of NBC. Dr. Conrad is assistant chief engineer of Westinghouse.

Dr. Davis

The two Pittsburgh radio scientists will be introduced by "Roxy" at the opening of "Roxy and His Gang" feature.

"Miss Radio of 1930" will be introduced, then Roxy will do his stuff. Unfortunately this program is not scheduled for local stations.

Following features to be broadcast from Madison Square's crystal studio are on local chain schedules. These include A. & P. Gypsies and "Real Folks."

THE NEW YORK TIMES, JANUARY 18, 1931.

H. P. DAVIS,
Vice President, Westinghouse Electric and Manufacturing Company.

I would not advocate 50,000 watts for a broadcasting station unless it had a cleared channel, nor for any station that is located in or near thickly populated areas.

If the sponsors or owners of a station have the courage to invest funds in a broadcasting property and plant, well removed from populous districts, and have the technical and financial ability to continuously operate such a station (for such stations do require higher technical operating ability and are much more than proportionally expensive to run), I strongly advocate 50,000 watts, or more; otherwise, the signals will not be of sufficient strength to reach the population and cover the areas for which they are designed, in an effective manner.

Of equal importance also with stations thus favorably located is the desirability of sufficient power to give adequate service to the greatest possible number in the rural population. To deliver a reliable day and night signal requires high power, and it appears to me wasteful of capital, organization and a valuable wave length not to be allowed to use the amount of power required to perform such a service.

Davis, H.P. 1879-1931 Papers AIS-1941

Yellow 1

Stockman-Farmer
Publishing Co.

110 Shady Avenue
Pittsburgh, Pa.

STOCKMAN-FARMER RADIO SERVICE

Information Bulletin *No. G-1-25*

Radios on Farms in Pennsylvania

More than 10,000 farm families in Pennsylvania have radio receiving sets and are listening in on world activities, according to the triennial farm census returns which have just been compiled by L. H. Wible, Director, Bureau of Statistics, Pennsylvania Department of Agriculture.

The National Stockman and Farmer, through Westinghouse Station KDKA, has conducted a broadcasting service for farmers for more than two years and in addition has carried a regular radio department in its weekly farm publication. It will be noted that in the counties surrounding Pittsburgh and in which The Stockman and Farmer has extensive circulation, a greater proportion of farmers are equipped with radio sets. It will also be noted from the statistics that less than 10 per cent of the total number of farmers in the state (slightly more than 200,000) have bought a radio set. The farm market is practically untouched and presents the greatest opportunity of any for future radio sales.

The figures showing the number of sets on farms in Pennsylvania with counties arranged in order follow:

Counties in order of radio sets on farms	No. of radio sets on farms	No. of farms in county
1. Westmoreland	882	5,593
2. Allegheny	744	3,972
3. Washington	660	4,482
4. Bucks	645	5,714
5. Montgomery	621	4,840
6. Chester	560	5,508
7. Butler	419	5,274
8. Armstrong	377	3,371
9. Fayette	294	3,267
10. Crawford	283	6,521
11. Delaware	233	1,287
12. Erie	222	5,485
13. Lancaster	216	11,307
14. Beaver	188	2,514
15. Lawrence	185	2,464
16. Berks	177	6,089
17. Venango	176	2,369
18. Bradford	174	5,200
19. Mercer	172	4,499
20. Indiana	161	3,935
21. York	150	7,818
22. Somerset	150	3,630
23. Greene	135	3,168
24. Northampton	135	3,283
25. Wayne	129	3,082
26. Clarion	124	2,931
27. Susquehanna	122	3,526
28. Lycoming	105	3,273
29. Lehigh	96	2,959
30. Luzerne	91	2,955
31. Columbia	83	2,603
32. Franklin	82	3,884
33. Tioga	79	3,702
34. Monroe	75	1,818
35. Jefferson	75	2,947
36. Cambria	74	2,396
37. Centre	74	2,295
38. Warren	73	2,353
39. Lackawanna	72	1,648
40. Clearfield	69	3,158
41. McKean	67	1,580
42. Wyoming	64	1,543
43. Bedford	64	3,462
44. Adams	62	3,451
45. Schuylkill	60	2,813
46. Cumberland	59	3,115
47. Pike	57	690
48. Northumberland	56	2,589
49. Dauphin	52	2,517
50. Potter	50	1,866
51. Blair	44	1,626
52. Huntingdon	39	2,111
53. Montour	36	774
54. Lebanon	32	2,372
55. Juniata	32	1,572
56. Fulton	30	1,350
57. Somerset	29	3,630
58. Perry	27	2,105
59. Union	23	1,411
60. Mifflin	21	1,108
61. Carbon	20	949
62. Clinton	19	1,065
63. Sullivan	18	836
64. Elk	15	856
65. Forest	9	416
66. Cameron	8	325

Stockman-Farmer
Publishing Co.

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Pittsburgh, Pa.

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25. Wayne	129	3,082
26. Clarion	124	2,931
27. Susquehanna	122	3,526
28. Lycoming	105	3,273
29. Lehigh	96	2,959
30. Luzerne	91	2,955
31. Columbia	83	2,603
32. Franklin	82	3,884
33. Tioga	79	3,702
34. Monroe	75	1,818
35. Jefferson	75	2,947
36. Cambria	74	2,396
37. Centre	74	2,295
38. Warren	73	2,353
39. Lackawanna	72	1,648
40. Clearfield	69	3,158
41. McKean	67	1,580
42. Wyoming	64	1,543
43. Bedford	64	3,462
44. Adams	62	3,451
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47. Pike	57	690
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59. Union	23	1,411
60. Mifflin	21	1,108
61. Carbon	20	949
62. Clinton	19	1,065
63. Sullivan	18	836
64. Elk	15	856
65. Forest	9	416
66. Cameron	8	325

NET PAID CIRCULATION

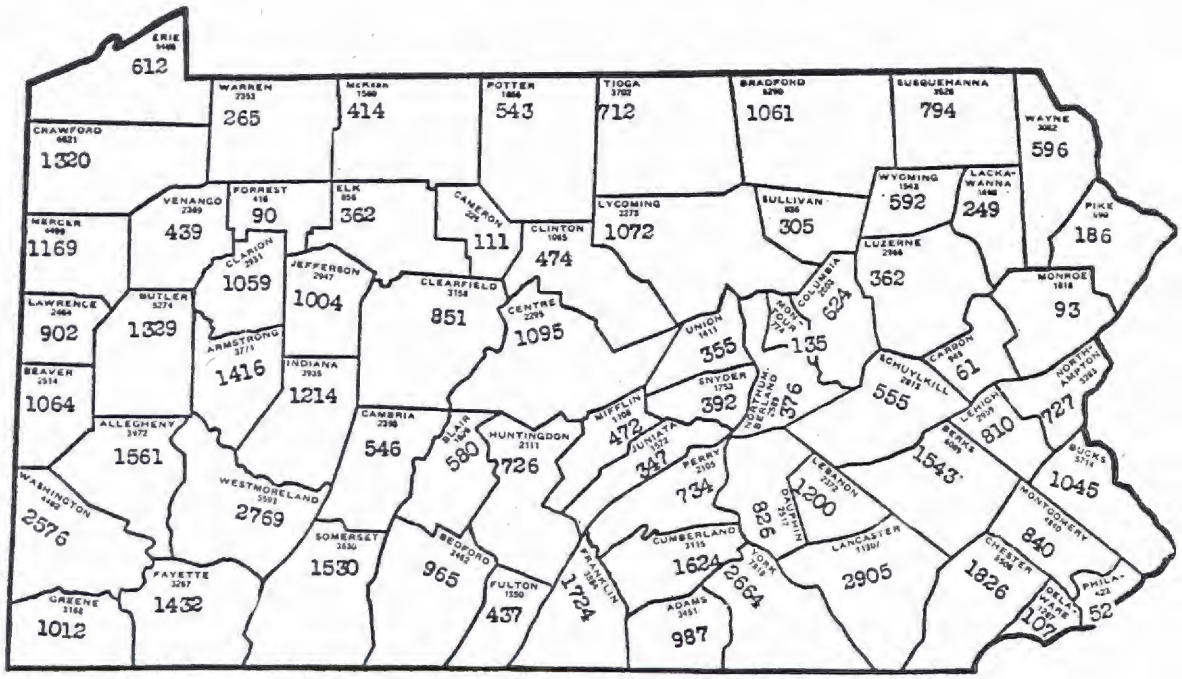
Pennsylvania Edition

THE NATIONAL STOCKMAN AND FARMER

Analyzed by Counties

AS OF

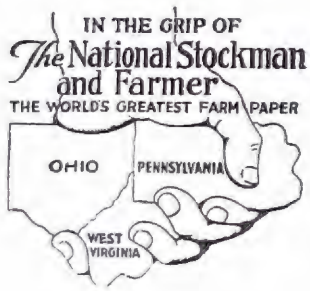
December 27, 1924



Adams	987
Allegheny	1561
Armstrong	1416
Beaver	1064
Bedford	965
Berks	1543
Blair	580
Bradford	1061
Bucks	1045
Butler	1329
Cambria	546
Cameron	111
Carbon	61
Centre	1095
Chester	1826
Clarion	1059
Clearfield	851
Clinton	474
Columbia	624
Crawford	1320
Cumberland	1624
Dauphin	826
Delaware	107
Elk	362
Erie	612
Fayette	1432
Forest	90
Franklin	1724
Fulton	437
Greene	1012
Huntingdon	726
Indiana	1214
Jefferson	1004
Juniata	347
Lackawanna	249
Lancaster	2905
Lawrence	902
Lebanon	1200
Lehigh	810
Luzerne	362
Lycoming	1072
McKean	414
Mercer	1169
Mifflin	472
Monroe	93
Montgomery	840
Montour	135
Northampton	727
Northumberland	376
Perry	734
Philadelphia	52
Pike	186
Potter	543
Schuylkill	555
Snyder	392
Somerset	1530
Sullivan	305
Susquehanna	794
Tioga	712
Union	355
Venango	439
Warren	265
Washington	2576
Wayne	596
Westmoreland	2769
Wyoming	592
York	2664
Total	58,820

Dec. 27, 1924

States	
Pennsylvania	58,820
Maryland	1,662
Virginia	1,317
West Virginia	12,111
Miscellaneous	1,700
Total	75,610



June 27, 1925.

MEMORANDUM OF THE PROPOSED ORGANIZATION OF A BROADCASTING COMPANY.

Form a broadcasting company to be known as the General Broadcasting Company.

The purpose of this Company will be to form a group of the best established and suitably located stations throughout the United States and Canada, for the purpose of organizing and improving general broadcasting conditions; to improve quality and to maintain it on the highest possible plane; to obtain the best in the way of programs; and to make available all national events and important performaces, of whatever character; and to make available the best talent obtainable, both musical and dramatic, occurring or appearing in the principal centers of this country.

It is the purpose also, while improving quality and programs, to reduce the operating expense to all members of the Company.

It is proposed to develop this organization into a national, and possibly an international, advertising medium which will be extended as much as possible with the hope of making the entire project self-supporting.

It is proposed tomake one or more of the broadcasting stations in the group, primary stations. These stations will be provided with long distance wire connections to such centers as Boston, New York, Washington, Philadelphia, and Chicago, with suitable pick-up net-work

in these cities for obtaining programs.

These primary stations will be equipped to broadcast on short or inaudible wave lengths, and will be super-powered for this transmission. These primary stations may also have audible wave transmission, but in this roll will occupy the status of the secondary stations.

The other stations will be secondary stations, with power equipment not in excess of _____ watts, and will broadcast on the longer, and audible, wave lengths. These stations will distribute the programs furnished from the primary stations, and will in addition use the stations for such local matters of interest, as seems desirable.

Each member station will pay a certain monthly fee to the General Broadcasting Company. This fee is to be used in the maintenance of all stations, and to defray other expenses of operation.

The Broadcasting Company will maintain a suitable executive force for general direction of the organization, to direct the general operations for procuring the programs, and to see the advertising, the fees for which will also be paid to the General Broadcasting Company.

The General Broadcasting Company will support a certain amount of research investigational work as will be necessary in the development of the general plan, and efficiency of the entire undertaking, and will give the necessary help required to member stations in a technical way.

The funds accumulating to the General Broadcasting Company

from various sources will, in addition to the purposes specified above, be used for hiring such talent as is used for general distribution to the members, and as its income accrues in excess ofits actual cost of operation, dividends are to be declared to the members, after proper reserves are set up.

H. P. Davis

PROPOSAL AS TO THE IMMEDIATE ORGANIZATION OF A "BROADCASTING SERVICE ASSOCIATION".

At its inception the members of the Association will be:

General Electric Company,
Radio Corporation of America, and
Westinghouse Electric & Mfg. Co.

The immediate objects to be achieved through this organization are:

1. The pooling and proper allocation of all expenses of operation and development of existing broadcasting stations belonging to the group.

2. The prevention of duplication of effort in development work having to do with broadcasting.

3. The establishment of a united front in dealing with the Telephone Company's broadcasting situation.

4. The unified control and direction of the general development of broadcasting, including plans for participation of outside or independent broadcasters in the association and the terms and conditions under which they will be offered participation.

5. A central control over programs.

6. The establishment of methods of securing income for service.

In order to accomplish the above it is suggested that this Association be governed by a Board of Trustees, one member from each of the parties and that they relinquish to said Board of Trustees the full control of operation and development of their existing stations, but not the ownership of them; the stations to retain their individuality as at present (i.e. name); the parties to contribute in proportions to be agreed upon to a fund which shall be under the control of the Trustees, out of which shall be paid the expenses of operation and development as aforesaid.

While it is not anticipated that any of the parties

will desire to operate and maintain broadcasting stations except those alreading existing, and which are to be included within the terms of this agreement, nevertheless nothing herein shall operate as a bar to such action if they so desire. Moreover, if the Trustees shall determine that any of the stations included in this agreement are no longer useful to the broadcasting organization, they (the Trustees) shall so notify the owner and he may then operate it as an independent station at his own expense, or discontinue it as he sees fit.

At the first meeting of the Trustees they shall make an estimate or budget of the cost of operation and development of stations included in the Association for a stated period and the parties to the Association after approval of said budget shall underwrite it. Thereupon the Trustees shall be authorized to call these subscriptions from time to time at their discretion. Similar periodical budgets shall be submitted in like manner. Any expenses beyond the budgets so approved must receive special approval.

The Board of Trustees shall be charged with the duty of the development of broadcasting in its wider aspects, commercial, political, and social, it being the intention to place in the hands of said Board the broadcasting problem of the nation insofar as the parties are concerned or can contribute to it.

In order that the Trustees may be in a position to more effectually exercise their control over operation and development they shall have jurisdiction over the personnel in the various stations; the parties to the Association to agree to accept their decision in matters of employment and organization of their broadcasting personnel. The Trustees to create a sufficient central organization to effectually carry out the purpose of this Association.

Trustees to have jurisdiction over broadcasting development and

experimental work of the Association, both as to its character and the location of factories where it shall be carried on. Any such work carried on by any of the parties independently of the Trustees shall be at that party's own expense.

September 8, 1925.

P L A N

FOR THE SUPPORT OF NATIONAL BROADCASTING THROUGH FORMATION OF THE PUBLIC BROADCASTING COMPANY

By David Sarnoff

Vice-President & General Manager
Radio Corporation of America.

- - - - - - -

INTRODUCTION

Notwithstanding the fact that there are over five hundred broadcasting stations in the United States, the need for a definite and fundamental step in the direction of a permanent system of national broadcasting is becoming increasingly apparent.

The problem, from its primary angles, might be stated as follows:

1. FROM THE PUBLIC STANDPOINT: There is no central and coordinating agency specifically charged with the duty of developing broadcasting as a permanent public service. The result is haphazard service in various parts of the country, poor reception conditions at other points caused by station interference, and general dissatisfaction with current programs, except for the feature programs

broadcast by the leading stations.

2. FROM THE GOVERNMENTAL STANDPOINT: Secretary Hoover has clearly and frequently directed the attention of the radio industry to the need of an economic solution of the broadcasting problem, in order that a permanent and assured system of broadcast communication be provided for national purposes. In addition, there is the fact that the problem of allocating wavelengths is making it increasingly difficult for the Government to exercise its functions in the air.

3. FROM THE INDUSTRY STANDPOINT: It is patent that the success of the Radio Industry is dependent upon the character and quality of the program furnished to the home. Inadequate broadcasting facilities can vitiate the progress made in receiving-set design. Lack of interest in program material will be reflected in falling sales. The delay in inaugurating a permanent national broadcasting system, founded upon an assured economic basis, is already reflected in the uncertainty that exists in distribution and trade channels.

4. FROM THE STANDPOINT OF THE RADIO CORPORATION AND ITS ASSOCIATES: While the Radio Corporation of America and its associates have a large and important equity in the success of the radio industry, it is true, nevertheless, that the burden of public service involved in radio broadcasting is being borne to a disproportionate extent by the Radio Group, to

the great advantage of those of the radio industry who are content to derive profits from sales without rendering equivalent public service.

CURRENT SOLUTIONS OFFERED FOR THE AMERICAN BROADCASTING PROBLEM:

Both from the experience of other countries and from experimental efforts in various directions made in the United States, the following may be summarized as the suggestions offered for the settlement of the broadcasting problem, other than the plans submitted in this report.

1. LICENSING OF RADIO-SET OWNERS.

The principle of direct payment for service received is founded upon the basis of sound economics, although the problems developed by broadcasting differentiates it from other services in this respect. It is generally agreed, however, that because of the spontaneous development of broadcasting in the United States, the proposal is impracticable. Any licensing proposal, it is believed, would be objectionable to the American public.

2. BROADCAST ADVERTISING.

Advertising by radio is still in an experimental stage, although sufficient progress has been made to indicate that it is a practicable source of revenue for radio broadcasting. It is still an open question whether legislation may not seriously affect the situation, when and if the practice of advertising by means of radio broadcasting threatens to become general.

There is also the great danger that radio advertising, if further extended, will tend

to become direct, rather than indirect, as at present, in which event public resentment might be expressed through political action.

Whatever may be said with regard to the possibilities of deriving revenue in this manner, the primary problem of the industry in general, and the Radio Corporation in particular, is to place broadcasting on a sound and permanent economic basis, and this involves a permanent source of revenue for a permanent public service.

3. A NATIONAL BROADCASTING SYSTEM THROUGH SELF-IMPOSED TAXATION.

A plan calling for the Radio Group to initiate a national broadcasting system, by seeking the voluntary support of other factors in the radio industry, and by revenue to be derived from broadcast advertising, from endowment, and other sources, does not seem timely, for the reason that no true basis exists for voluntary cooperation within the industry. As in the early days of every industry, too many opportunists and other irresponsible factors exist, whose voluntary cooperation cannot reasonably be expected. The result of such a plan, therefore, it is probable, would be to throw an even greater burden than at present upon the Radio Group.

THE POLICY OF THE RADIO CORPORATION TOWARDS THE BROADCASTING PROBLEM

The policy of the Radio Corporation towards the broadcasting problem has been consistent throughout. We were the first to propose the basis of a solution on sound economic lines, viz: that a tax be levied at the source of manufacture upon the sales price of radio products, as the first step

towards the support of a national broadcasting program.

We have stood upon the ground that before such a system could be organized, it was necessary to develop the art to a stage where national facilities were technically practicable and economically possible.

We proposed the development of super-power, so that the country might be covered by the fewest possible number of high-grade broadcasting stations. This principle has come to be generally accepted, not only by technical experts, but by the listening public.

It is our duty now, both from the standpoint of public service and in our own interest, to cooperate in the initiation of a plan that shall be the first step in the economic solution of the broadcasting problem.

THE PLAN

The plan outlined herewith contemplates the formation of the

Public Broadcasting Company.

This company, incorporated under federal charter, would be a non-profit-making organization, in which the Radio Group, independent broadcasters,

the Government, and public interests could participate, for the Government, the public, the industry, as well as other broadcasters, are all vital factors in the solution of the broadcasting problem.

BASIS AND CHARACTER OF ORGANIZATION

Since the inauguration of the Radio Industry, Secretary Hoover has taken a leading position in behalf of public service towards radio. He has appealed to the industry on various occasions to cooperate in the solution of the broadcasting problem. It is probable that he is waiting for action by the radio industry itself before deciding upon his position towards a constructive plan for the organization of a National broadcasting system. The Radio Group, as leaders in the industry, cannot cooperate more effectively than by joining in the formation of the Public Broadcasting Company under the chairmanship of Mr. Herbert Hoover.

The Board of Governors of the Public Broadcasting Company, in addition to Governmental representation, should include members of the radio industry, prominent independent broadcasters, newspaper interests identified with broadcasting, leaders of education in the United States, representative social service leaders, and those prominent

in operatic, musical and music-publishing enterprises. The public character of these institutions could be further augmented by a Board of Trustees that would reflect every phase of American life and activity, including labor. This would materially strengthen the political appeal of such a project.

TRANSMISSION FACILITIES

Because of the fact that by wire inter-connection in most cases and by radio inter-connection whenever possible, the broadcasting stations now maintained by the Radio Group could form the nucleus of a national broadcasting system, we should offer to sell or lease or even to lend, such of our stations to the Public Broadcasting Company as it may require for its public service. With similar contributions made by other interests, upon the same basis, it is submitted that an efficient broadcasting transmission system could be immediately developed.

To demonstrate our motives of public service, the terms of our contribution should be as generous as the circumstances require. We would accept debentures from the Public Broadcasting Company for such contributions in this respect as we are called upon to make.

HOW REVENUE IS TO BE DERIVED

Based upon the accepted economic position of payment for service, a tax should be levied by the Government at the source of manufacture upon the sale of radio products, for the support and maintenance of the Public Broadcasting Company. Conservatively estimating the sale of radio products for the next five years at two hundred million dollars annually, a five percent. tax would net a yearly income of $10,000,000.00.

In view of the fact that the Public Broadcasting Company, with an assured system of national transmission facilities at its command, would be the first permanent organization of this character, definitely supported and working purely in the public interest, a substantial source of support, it is believed, could come from public endowments. A plan to this effect, providing in detail for the organization of a system of educational, cultural and musical foundations for radio, has been worked out in detail by the Radio Corporation and is ready for consideration in connection with any primary solution of the broadcasting problem which may be adopted.

Following upon the practice of national broadcasting systems abroad, another material source of revenue might be derived from a program publication to be issued by the Public Broadcasting Company,

in which advertising would be accepted.

DEVELOPMENT OF PLAN

In view of the great importance of radio broadcasting and the vast measure of public and congressional interest in the art, a bill could be prepared for Congress that would combine the charter of incorporation, the means and methods of collecting the necessary revenue from radio manufacturers, and which would fix a form of organization in which Governmental participation would be permanently assured (preferably by the membership in the Board of Governors of the Secretaries of Commerce, Treasury, War, Navy, Interior and the Postmaster General of existing and future administrations), provided that Mr. Hoover and such congressional leaders as Congressman White and others are in sympathy with the principle of this plan.

It is obvious that the presentation of such a bill would have to take into consideration its legal, political and public aspects. The consideration already given to the problem by Secretary Hoover, Congressman White and other members of the Administrative and legislative branches of the Government would make their cooperation in these respects invaluable.

It would, therefore, be best if the problem,

as a whole, was first crystalized by Secretary Hoover before the forthcoming conference in Washington of the radio industry, to be followed by our own acceptance of the principle. Thereafter, we could cooperate in working out the details that would show the plan as technically sound, financially possible and legally practicable.

STATUS OF BROADCASTING UNDER THIS PLAN

The Public Broadcasting Company, operating on exclusive wave-lengths reserved to it by the Government, would regularly broadcast a series of primary programs through its national broadcasting system. This system would be the backbone of a permanent, national broadcasting service.

Independent broadcasters who desire to do so, might operate their stations, as at present, at available wave-lengths.

Manufacturers who, for publicity or other reasons, desired to contribute individual programs, could continue the practice.

Communication or other interests which, for one reason or another, desire to experiment with and technically develop the art of broadcasting, would be left free to continue their projects.

SUMMARY

The plan submitted herewith provides:

1. For the formation of the National Broadcasting Service, an organization in which the industry, the public and the Government would be represented.

2. For the sale, or leasing, or lending, of broadcasting facilities to the P.B.C. by the Radio Group, as well as by other manufacturing or broadcasting interests.

3. For legislation imposing a sales tax, levied at the source of manufacture upon radio products, for the support and maintenance of the Public Broadcasting Company.

4. For additional means of support to a national broadcasting program by endowment and by the publication of a program magazine which would contain paid national advertising.

5. For the continuance of individual opportunity to newspapers, manufacturers and other broadcasters who may desire to distribute programs through their own stations.

David Sarnoff

New York, August 12th.

December 18, 1925.

Memorandum of conference of Primary Committee on Broadcasting, between

Mr. A. G. Davis, General Electric Company,
Mr. H. P. Davis, Westinghouse Company, and
Mr. David Sarnoff, Radio Corporation,

regarding proposed Broadcasting Service Company.

The proposed Company will be owned by the three companies of the Radio Group in proportions to be agreed upon and each of these companies will furnish capital in proportion to its holdings.

It will have the exclusive right to broadcast for revenue so far as that right can be given to it by the three companies and by the Telephone Company.

It will maintain studiosand produce programs and will leaseor purchase or otherwise acquire such facilities or the use of facilities that may from time to time be necessary for distributing programs to a chain of stations on terms to be arranged between the Broadcasting Service Company and the stations.

In principle, the stations of the three companies are to be members of the chain, but no station of the chain is to lose its identity. The three companies are also to give to the Broadcasting Service Company the exclusive right under their patents and copyrights to transmit signals to other broadcasting stations. It is contemplated that the Telephone Company shall not be in the business of furnishing programs as dintinguished from transmitting by wire programs of others.

The principle is the maintenance of two services:

1. A national service furnished by the Broadcasting

Service Company and made available to a chain of stations each under proper contract relation with the Broadcasting Service Company.

2. A local service maintained by the associated stations for broadcasting their own local programs.

The contract between the Broadcasting Service Company and the local stations of the chain will provide in general that the local stations will devote certain specified times to the national programs.

The charter of the Broadcasting Service Company will be broad enough to enable it to own, lease or operate broadcasting stations, and also to make contracts with local stations upon such terms and conditions as may seem proper to it.

The immediate necessity is to work out this plan in coordination with suggestions as contained in Mr. Bloom's memorandum of November 18, 1925, in sufficient detail to enable us to present to the RCA Board at an early date a reasonably accurate forecast of the balance sheet of such a company, together with a general forecast of its scope and set-up.

For the above purpose, the following sub-committee is appointed:

Sub-Committee

For the General Electric Company	- Martin P. Rice W.R.G. Baker
For the Westinghouse Company	- J. C. McQuiston Frank Conrad
For the Radio Corporation	- Dr. Alfred N. Goldsmith Charles B. Popenoe

Among other things, the Sub-Committee will study the general

set-up of the proposed Broadcasting Service Company and make recommendations regarding its operation, its budget and its relations with the local stations, and also study all the requirements of wire and radio service, the economy of the proposed wire rates, submittec by the Telephone Company, and the character of the wire service.

De mber 18, 1925.

MEMORANDUM OF CONFERENCE OF PRIMARY COMMITTEE ON BROADCASTING BETWEEN MR. A. G. DAVIS, GENERAL ELECTRIC COMPANY MR. H. P. DAVIS, WESTINGHOUSE COMPANY and MR. DAVID SARNOFF, RADIO CORPORATION REGARDING PROPOSED BROADCASTING SERVICE COMPANY.

The proposed company will be owned by the three companies of the Radio Group in proportions to be agreed upon and each of these companies will furnish capital in proportion to its holdings.

It will have the exclusive right to broadcast for revenue so far as that right can be given to it by the three companies and by the Telephone Group.

It will maintain studios and produce programs and will lease or purchase or otherwise acquire such facilities or the use of facilities that may from time to time be necessary for distributing programs to a chain of stations on terms to be arranged between the Broadcasting Service Company and the stations.

In principle, the stations of the three companies are to be members of the chain, but no station of the chain is to lose its identity. The three companies are also to give to the Broadcasting Service Company the exclusive right under their patents and copyrights to transmit signals to other broadcasting stations. It is contemplated that the Delaware Company shall not be in the business of furnishing programs as distinguished from transmitting by wire programs of others.

The principle is the maintenance of two services:

1. A national service furnished by the Broadcasting Service Company and made available to a chain of stations, each under proper contract relation with the Broadcasting Service Company.

2. A local service maintained by the associated stations for broadcasting their own local programs.

The contract between the Broadcasting Service Company and the local stations of the chain will provide in general that the local stations will devote certain specified times to the national programs.

The charter of the Broadcasting Service Company will be broad enough to enable it to own, lease or operate broadcasting stations, and also to make contracts with local stations upon such terms and conditions as may seem proper to it.

The immediate necessity is to work out this plan in coordination with suggestions, as contained in Mr. Bloom's memorandum of November 18, 1925, in sufficient detail to enable us to present to the RCA Board at an early date a reasonably accurate forecast of the balance sheet of such a company, together with a general forecast of its scope and set-up.

For the above purpose, the following sub-committee is appointed:

Sub-Committee

For the General Electric Company - Martin P. Rice
W. R. G. Baker

For the Westinghouse Company - J. C. McQuiston
Frank Conrad

For the Radio Corporation - Dr. Alfred N. Goldsmith
Charles B. Popenoe

Among other things, the Sub- Committee will study the general set-up of the proposed Broadcasting Service Company and make recommendations regarding its operation, its budget and its relations with the local stations, and also study all the requirements of wire and radio service, the economy of the proposed wire rates, submitted by the Telephone Company, and the character of the wire service.

December 18, 1925.

MEMORANDUM OF CONFERENCE BETWEEN
MR. A. G. DAVIS, GENERAL ELECTRIC COMPANY
MR. H. P. DAVIS, WESTINGHOUSE COMPANY and
MR. DAVIS SARNOFF, RADIO CORPORATION.

This company at the end of six months will be owned by the three companies in proportions to be agreed upon and will furnish capital in proportion to their ownership.

It will have the exclusive right to broadcast for revenue so far as that right can be given to it by the three companies and by the Telephone Group.

It will maintain studios and produce programs and will lease or purchase or otherwise acquire such facilities or the use of facilities that may from time to time be necessary for distributing the program to a chain of stations on terms to be arranged between the Broadcasting Company and the stations.

In principle, the stations of the three companies are to be members of the chain, but no station of the chain is to lose its identity. The three companies are also to give to the Broadcasting Company the exclusive right under their patents and copyrights to transmit signals to other broadcasting stations.

The principle is the maintenance of two services:

1. A national service, to which will be available a great chain of stations, each in proper business relation with the Broadcasting Company.

2. The maintenance of the stations for the purpose of furnishing local programs a part of the time, under such conditions that the greatest possible stimulus will be exerted on the individual stations to do that work in the best possible way.

The contract between the Broadcasting Company and the individual stations of the chain will provide in general that the individual stations will devote certain specified times to the national broadcasting, and that in the case of any great national event, they will disarrange their local programs to whatever extent may be necessary. They will of course protect the individual station against being obliged to broadcast matter that they cannot properly broadcast.

There is to be nothing in the charter of the National Company to prevent it from owning or operating broadcasting stations, or preventing it from making arrangements that seem best to it to allow the individual stations to broadcast local advertising on terms satisfactory to the National Company.

The immediate necessity is to work out this plan in coordination with Mr. Bloom's suggestion in sufficient detail to enable us to present to the Board at an early date a reasonably accurate forecast of the balance sheet of such a company, together with a general forecast of its organisation etc.

The following sub-committees are appointed:

General Sub-Committee

For the General Electric Company - Martin P. Rice

For the Westinghouse Company - J. C. McQuiston

For the Radio Corporation - Charles B. Popenoe

Technical Sub-Committee

For the General Electric Company - Mr. Baker

For the Westinghouse Company - Frank Conrad

For the Radio Corporation - Dr. A. N. Goldsmith

The scope of the General Subcommittee is as follows: To study the general set-up of the proposed service company and to recommend regarding its operation and its budget and its relations with the stations in the chain.

The scope of the Technical Subcommittee shall be to study all the requirements of wire service and the economy of the proposed wire rights, submitted by the Telephone Company, and the character of the wire service.

Submitted by C.W.Horn, Supt. Radio Operations. April 17,1926.

WHAT RADIO BROADCASTING NEEDS.

I have viewed the last five years of radio broadcasting very much in the light of a big experiment and have endeavored to gainfrom it sufficient information upon which to base its future possibilities and to obtain an idea of the lines along which this development would proceed. I did this for a rather personal reason in that my future activities in radio are to a great extent dependent upon the direction of growth. I have, therefore, been giving this matter considerable attention and have formed a few opinions which I will give below. I believe this is what you wanted when you requested me to write down for you the practical possibilities of radio and the probable direction of development. I am dividing this into two headings:

(a) Technical
(b) Program

TECHNICAL

The average person's conception of radio today is not a true one. Mention radio and he mentally pictures a receiving set, loud speaker and a few other pieces of apparatus, with perhaps the names of a few artists or programs. In reality I feel that radio is a distinct line of development, a branch of alternating current itself, a distinct field and one which will fill a long felt want on the part of the human race to overcome the barriers of distance and space. This radio has already done to a small extent in that it enables programs to be transmitted to distant points.

Radio is a service only a part of which is now being rendered. Just as wires are not telephone service, just so is present day radio not "Radio Service." We have much to accomplish and many features to add before it becomes a necessary service. However, we have before us radio vision - radio control of clocks and other devices, etc.

So much for my dream as to the future possibilities of radio. At present we are concerned with a very congested atmosphere, there being 534 stations licensed, with something like 526 additional applications pending. Obviously, such a condition cannot continue to exist, as there are but 86 wavelengths available at the present time. Unless these stations are reduced in number through elimination and the only businesslike method by which this number can be brought to a reasonable figure is through economic pressure. This latter will mean stiff competition, which will be somewhat expensive but will undoubtedly benefit in the end, and which will show the average station owner who has no ultimate reason outside of advertising for broadcasting that it does not pay him to be in that business. I feel that some day in the

near future this condition will arise and there will be a wholesale deletion of licensees. In order to be prepared to bring about this competition, or condition, those who have an ultimate reason for being in this field and who intend to remain therein must prepare by entrenching themselves firmly. That means a combination of stations into a powerful group controlling its sources and avenues of program. The Westinghouse Company and its associates are in an excellent position for this purpose in that they are owners of the most powerful and best known stations and are all associated, so that it is but a step to form a real combination in the broadcast field.

At the present stage of development it is obviously impractical for a few stations to cover the entire country. Interconnection seems the logical answer and we have two means of doing this:

(a) The proven one, which is by wires, and
(b) The experimental one, or short waves.

The individual stations should have sufficient power to thoroughly cover a reasonable radius about their station and should pay particular attention to quality of transmission. The stations should be so located that they will not overlap very much and care should be taken that the signal strength from the nearest station is sufficient in all parts of the territory to override the average static and interference.

Any combination which intends to engage in interconnection at the present time should depend to a great extent upon wire line interconnection. In the near future there is a possibility of forming a combination of short wave and wire line interconnection with the distant future possibily permitting interstation connection by radio alone.

As we have to deal with the present, we must consider the present wire situation. The A.T. & T. Co. has the most efficient system at present. Its trunk lines connecting the principal cities are already prepared for radio program transmission, or can be prepared. In addition, that company has its repeater stations with trained attendants, which will permit the installation of proper repeating and correcting devices for maintaining high quality. In addition they have a sufficiently large plant to permit spare wires and routes in case of emergency. The only other services available at present are Western Union wires, which are either already transposed or can be prepared, along definite routes connecting the principal cities. In view of the patent situation the Western Union cannot operate repeaters but can merely rent the lines. In other words, the Telephone Company can furnish complete service from point of pickup to the station terminals, while the Western Union Company will only furnish the wires suitably prepared, but all pickup equipment, line amplifiers, correction devices, etc. must be furnished and manned by the broadcasting interests.

The rates for wire line interconnection in the case of the Western Union are definitely fixed by the Interstate Commerce Commission, as the rental charge for wires is filed with that commission In the case of the Telephone Company, broadcasting not yet being recognized as a definite public service, is not listed on the tariff files of the Commission and the rates at present are whatever the Telephone Company feels like charging.

In summarizing the technical phase of this discussion, I wish to state that the future looks bright for radio, having so many fields and avenues along which to develop. I feel that radio broadcasting will become a more stable proposition when the number of stations is reduced and that it will be along economical lines rather than through legislation that this will be brought about. I feel that the field is waiting for the radio group to set the pace and bring about this competitive condition. I have pointed out the wire situation and the necessity for wire connection and at the present time and probable future conditions of short wave interconnection. I have also shown that the most reliable service can be furnished by the Telephone Company and that the matter of cost will have to be determined by "bargaining." The picture, therefore, of the future system is a network of stations throughout the country, each individually capable of covering its territory with excellent transmission, sufficient signal to override interference, and with a program that cannot be matched by individual or small groups.

PROGRAM

At the present time broadcasting reminds me very much of ordinary vaudeville performances. The microphone is switched on, the announcement is made, giving the name of the singer, the selection and the author, and the artist does his part. This then is repeated very much as the acts appearing on a stage in a vaudeville house. This could really be termed "vaudeville broadcasting," or, as we used to say "variety shows." This has not been satisfactory in that it is a monotonous repetition of selections. The Telephone Company, I notice, has realized the necessity of breaking away from this type of program and is offering what we might term "Hours." KDKA did this simultaneously with the Telephone Company. We now occasionally obtain a program which has a continuous story, or thread, to keep the listeners' interest until the conclusion. This is an improvement but is yet far from being what we feel radio broadcasting should be.

When the average person visits a show he expects to be entertained and to leave with a satisfied feeling. For this purpose the stage director endeavors to draw the attention and mind of the audience and make them feel, or live, with the actors through the show. He has at his command and does use many devices, such as scenery, music and accessories to produce certain effects. He appeals to the brain and heart of the audience through two senses, the eye and the ear, and, in some few instances, the sense of smell, by perfumes, incense, etc. The motion picture director had a more difficult task in that he had but one sense, that is the eye, through which he

could appeal to the mind of his audience. You will note that the early motion pictures were "one-reelers" and in many ways similar to the radio performances of today. Then came the two-reelers, which might be classed as paralleled by our radio "Hours." Do you remember when between each reel some slides were shown? The pauses now between our selections are in the same class and are becoming as offensive to the ear as those slides were to our eyes in the early days of motion pictures.

Therefore, in order to look for a possible solution to the question "What will be the program of the future?" let us take a page out of the history of themotion pictures. In attending a performance at the Capitol Theatre, New York, you first of all are ushered to a comfortable seat. The show starts generally with an overture played by an excellent orchestra, generally followed by additional music featuring perhaps a ballet and usually a rendition by some talented artist. Without any pauses the program shifts from one piece to the next, and, while the orchestra is still playing the screen is brought into sight, and the machine having already been adjusted, the picture starts without any flickering and we see, perhaps, a news reel, at the conclusion of which, without the slightest hestitation or sudden change, it may fade into a comedy or perhaps the screen disappear and a stage seene may be brought before us. Without the slightest break the next act takes place with perhaps finally the feature picture being brought on and run through to its end without a single break, shifting from one reel to another so that the eye cannot notice it. At the conclusion of such a performance, if all parts of the program are of average worth, one feels satisfied and pleased. All of this has been carefully worked out by stage directors who have vision and who visualize what they want to do and how they want to do it.

Now, let us parallel this with radio. First, we need one person who has the artistic sense and necessary experience to know what can be done and how to do it. In other words, we need a stage director, or "Producer." There must be but one man in authority in a case like this and he must be given a sufficiently free hand in order to be able to put over his thoughts and ideals. Such a man would createa show, appealing to the ear in his case, just as the movie director appeals to theeye. He would run the continuous thread of thought and createplays with the climax at the proper point in order to hold the attention of the listener. We all have experienced the reluctance to break away from a movie in the middle of its performance. The artistic development of presentation for aural reception will have to be worked out very much along the same lines that the presentations for visual reception were worked out. I feel that men can be developed who will be able to take an orchestra, with some additional talent, and work it into a play with an appeal which will satisfy the listener.

You will remember that WGY started rather intensively to have plays written suitable for radio presentation. This was a step in the right direction but they stopped short of their objective. I feel, however, that they had the right conception but not sufficiently far advanced to realize that spoken plays alone do not satisfy.

It will, of course, be rather an expensive proposition for individual stations to have such a high class directorship and productions, but that is all the more reason why we should encourage this, as through a combination of stations we could finance such productions, thus setting the pace, which, as I explained above, will, in my opinion, economically solve the broadcasting problem. It is through some big effort, some breaking away from what we are accustomed to know that we will regain the leadership in broadcasting and set the pace, which will be too fast for the individual station owner who is interested only in advertising.

I have spoken to theatre people and many program directors, etc., in an effort to gain their ideas and thoughts and I believe that the usual calibre of broadcast program personnel is too low to conceive of anything better than what they are now doing. This is another reason why we should act on this opportunity of doing this more elaborate and finer thing and why I feel that we should get together with our associates and form an organization capable of handling such a proposition.

I believe that when such an organization does exist it will obtain the support and cooperation of music publishers, dramatic leagues, etc., for the reason that the director of a chain of stations covering the country will be more likely to keep from offending the ears of the listeners by repetitions of "By the Waters of Minnetonka," or some other composition that is being played to death. That is one of the big objections that the music people now have, in fact the only real complaint that they can make. In my opinion, an organization handling such a proposition must look for the one man who will undoubtedly become world famous if successful - one who can mould his program to such a point that he can command the attention of the majority of his listeners.

With this, of course, I consider that the advertising value of the stations will rise and the rates must, of course, be such that they will support such an organization. But, because of this high standard, there is no doubt that this will create additional returns for the purchasers of time, so as to make it worth while paying these additional rates. For, after all, it must be remembered that the amount of available time is limited to a few hours a week.

In summing up I feel that all efforts should be directed toward forming an organization capable of handling such a proposition as outlined above. The selling of time is a logical way of financing such a plan but in order to coordinate the work, in order to be able to follow definite policies, the matter of program should be entirely under the control of the Broadcasting Company. I believe that only national broadcasting of the best grade will be the final result during certain hours, with local programs at other times to satisfy any desire the public may have for such local affairs.

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A PROPOSED PLAN FOR THE

ORGANIZATION OF

THE MID - CONTINENT RADIO CHAIN

The past year has seen a new force enter the advertising field - namely RADIO PUBLICITY. With a radio audience counted by millions, it is only natural that national advertisers should take advantage of it to secure publicity and create good will. Today numerous firms are availing themselves of these possibilities.

Each broadcasting station covers a specific field and when several of these are welded into a chain they become a medium of nation-wide scope and it is this broad coverage that holds the greatest attraction for national advertisers.

Realizing the possibilities of radio publicity the American Telephone and Telegraph Company are now endeavoring to build a nation-wide chain. According to the latest reports fourteen stations have joined this net work and publicity programs are now being sold to advertisers over this chain.

Their plan is to transmit the programs from New York to the various stations by land wire thus making it necessary for all stations on their chain to broadcast simultaneously. This represents a tremendous waste because a large majority of the receiving sets in use today can pick up at will a half dozen or more of the American Telephone and Telegraph Company's chain but they can listen to only one at a time. If the various stations could broadcast at different periods this duplication would be reduced to a minimum and we believe it is possible to work out some such plan.

Through the organization of a Mid-Continent Radio Chain, such as outlined below, there would be available to national advertisers the use of radio facilities that would blanket the country and give them an arrangement whereby their message would be on the air every night in the week.

The Mid-Continent Chain would be composed of six powerful, well established stations in the middle West - each pperated by a big influencial newspaper namely:

STATION	OWNER
WMAQ	Chicago Daily News
WWJ	Detroit News
WBAP	Fort Worth Star-Telegram
WDAF	Kansas City Star
WHAS	Louisville Courier-Journal
KSD	St. Louis Post-Dispatch

These stations, all strategically located, are ideally situated for nation-wide broadcasting. They form a band from the northern to the southern boundary of the country. Because of their location they probably have a greater range and field than could be secured by any similar sized group of stations.

A 500 mile radius is a very conservative estimate of the field of maximum efficiency of each of these stations. If these six 500 mile circles are placed on a map we find that 85% of the entire population of the United States is within the field of one or more of these stations. Forty two percent of the entire population of the United States is within 500 miles of three or more of the stations.

If each of these broadcasting stations would assign one night a week for the Mid-Continent Chain program it would leave the balance of the week to be filled as each station might desire and give ample opportunity for thesale of individual programs should they so desire. The Mid-Continent nights on the various stations would be staggered. One station would have Monday, another Tuesday, etc., throughout the week to Saturday. The chain organization would then have available for advertisers one night a week on each station and one station for each night in the week.

These nights would be divided into hour or half hour periods, and the same period each night would be sold to the same advertiser. Thus Blank & Company would be on the air from WWJ from 8 to 9 P.M. Monday, from WMAQ from 8 to 9 Tuesday, and so on through the week. Every night except Sunday they would be on the air from some one of the six stations.

The general character of the program would be the same each night although the entertainers would be different, of course, in each city. Each station would engage a group of paid entertainers for that particular night throughout the season. The talent employed would be such that it could easily give many widely diversified programs each evening. For instance, the group could be composed of the following:

2 tenors	1 contralto
1 Baritone	1 Accompanist
1 Basso	1 Orchestra leader
1 Soprano	12 piece orchestra

Based on the experience of the Post-Dispatch, such a group, made up of A1 talent, could be secured for the following prices if they were assured of an engagement each week. The actual expense would be governed by the number of periods sold.

6 Singers @ $15 per night	$90
1 Accompanist @ $15 per night	15
1 Orchestra director @ $25	25
12 Piece orchestra	120
Total Cost	$250

We would expect to spend [illegible]

The varied type of programs that such a group could give are almost innumerable. For example the following schedule might be arranged.

7	to 7:30	Program of songs by mixed quartette
7:30	to 8	Program by string quartette with vocal solos.
8	to 9	Program by Little Symphony Orchestra
9	to 9:30	Program vocal solos and duets, popular or classical
9:30	to 10	Program by male quartette
10	to 11	Program of dance music

The advertiser could thus have the type of program which appealed to him. The identity of the performers would not be given and the program and entertainers could be designated in some way so as to associate them with the advertiser as is now being done with the -

Goodrich Silvertown Orchestra	Atwater Kent Artists
Gardner 8-in-line Entertainers	The Everready Hour

Cost to Advertisers

Rates for programs over the radio are fairly well established at from $200 to $300 per hour plus the cost of building the program. The A. T. & T. Co. is at present charging $2600 per hour for twelve stations not including cost of talent.

The cost of programs over the Mid-Continent Chain could be based on an hourly rate of $250 per station, which would include the cost of the program. The charge for half hour periods would be one half the hourly rate plus 10%.

For the time being it might be well to eliminate June, July and August thus establishing a 40 week objective, with four cycles of ten weeks each. The above rates would be for contracts of twenty weeks and an additional charge of 10% might apply on ten week contracts. A special summer rate could be established if it seemed advisable.

On the above basis we find that advertisers would receive the following propositions:

One hour each night (except Sunday) on some one of the six stations (6 programs a week) for 20 weeks	$30,000
Same as above for 10 weeks	16,500
Half hour each night (except Sunday) on some one of the six stations (6 programs a week) for 20 weeks	16,500
Same as above for 10 weeks	9,000

REVENUE to the Stations

Certain fixed charges would have to be deducted from the gross revenue. These would include the cost of building the program, commission to advertising agencies and the expense of organization and selling. The maximum possibilities for one evening would be from 7 to 11 PM or four hours. If this were sold at an average rate of $250 per hour the revenue to each station per night would be as follows:

Gross revenue (4 hours @ $250)		$1,000
Expenses:		
Agency Commission (15%)	$150	
Cost of program	250	
Organization expense (10%)	100	500
Net Revenue per week		500
Net Revenue for 40 weeks		$20,000

If only half of this amount of time were sold the first year, the idea would still be practical for the expense of a two hour program would not be as Heavy and the selling expense would also be less. The following is a fair estimate.

Gross Revenue (2 hours @ $250)		$500
Expenses:		
Agency commission (15%)	$75	
Cost of program, less than	200	
Organization expense (10%)	50	325
Net Revenue per week		$175
Net Revenue for 40 weeks		$7,000

The above calculations do not take into account the possibilities of additional contracts which will, no doubt, develop if broadcasting continues to be a popular form of advertising.

If the idea is exceptionally well received, a second night could be added on each station at any time thus doubling the revenue possibilities.

Organization Work and Expense

If the organization was peffected promptly it would allow three months for a selling campaign before actual broadcasting was begun on September first and if the idea is going to be the success it promises this would be ample time to have all of the time sold for the first cycle.

With ample time for the selling work and with only four hours time to be disposed of, the selling organization need not be large. In fact one high grade solicitor, familiar with radio, advertising agencies and national advertisers would be sufficient.

This solicitor could be paid a salary and bonus. For example, $5,000 a year and 2 1/2% of the gross sales. On this basis if he sold four hours at $1500 per hour the gross sale would be $6000 per week which would make the 40 weeks gross sales amount to $240,000 and his compensation $11,000 a year. This would leave $13,000 for traveling expense, literature and promotion.

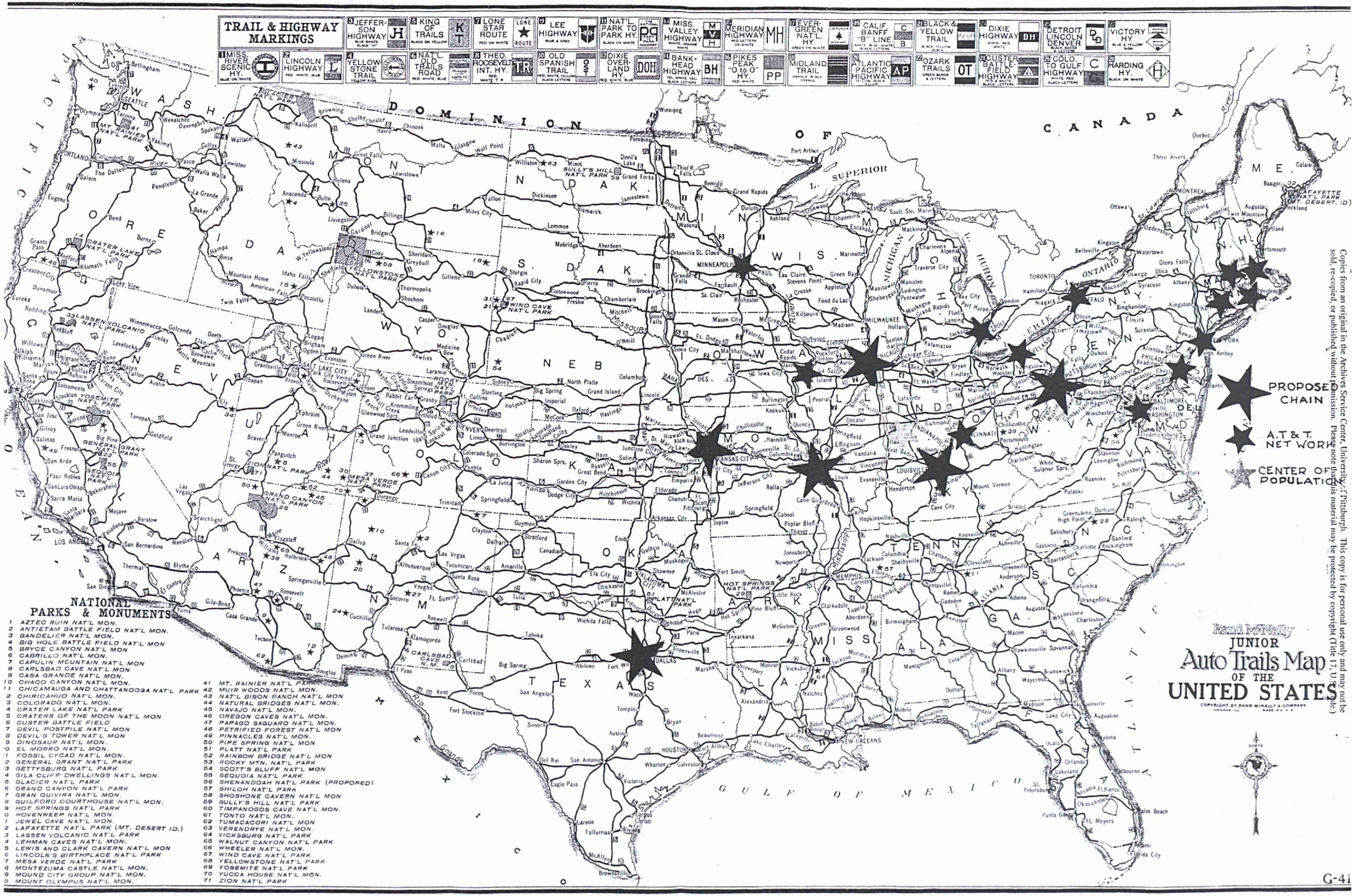
In case only two hours were sold the gross sales would be $120,000 and his compensation $8,000 leaving $4000 for expenses and promotion.

A definite idea could be obtained as to the success or failure of the plan in at least two months. The only expense would be two months salary of the solicitor or about $800 plus expense and promotion. The total should not amount to more than $300 per station.

With a limited amount of time to sell an elaborate promotion campaign would not be necessary. The whole story could be told in one booklet or folder which would be distributed amongthe advertising agencies and prospective advertisers.

No office need be established at first and the administrative details could be looked after by one of the chain. Future action in this connection would be determined by the success of the venture and subsequent developments.

This above outline is presented merely as a basis for discussion in the hope that some practical plan may be workedout which will be advantageous to both advertiser and broadcasting station.



NATIONAL PARKS & MONUMENTS

1 AZTEC RUIN NAT'L MON.
2 ANTIETAM BATTLE FIELD NAT'L MON.
3 BANDELIER NAT'L MON.
4 BIG HOLE BATTLE FIELD NAT'L MON
5 BRYCE CANYON NAT'L MON
6 CABRILLO NAT'L MON.
7 CAPULIN MOUNTAIN NAT'L MON
8 CARLSBAD CAVE NAT'L MON
9 CASA GRANDE NAT'L MON.
10 CHACO CANYON NAT'L MON.
11 CHICAMAUGA AND CHATTANOOGA NAT'L PARK
12 CHIRICAHUO NAT'L MON.
13 COLORADO NAT'L MON.
14 CRATER LAKE NAT'L PARK
15 CRATERS OF THE MOON NAT'L MON
16 CUSTER BATTLE FIELD
17 DEVIL POSTPILE NAT'L MON
18 DEVIL'S TOWER NAT'L MON
19 DINOSAUR NAT'L MON.
20 EL MORRO NAT'L MON.
21 FOSSIL CYCAD NAT'L MON.
22 GENERAL GRANT NAT'L PARK
23 GETTYSBURG NAT'L PARK
24 GILA CLIFF DWELLINGS NAT'L MON.
25 GLACIER NAT'L PARK
26 GRAND CANYON NAT'L PARK
27 GRAN QUIVIRA NAT'L MON.
28 GUILFORD COURTHOUSE NAT'L MON.
29 HOT SPRINGS NAT'L PARK
30 HOVENWEEP NAT'L MON.
31 JEWEL CAVE NAT'L MON.
32 LAFAYETTE NAT'L PARK (MT. DESERT ID.)
33 LASSEN VOLCANIC NAT'L PARK
34 LEHMAN CAVES NAT'L MON.
35 LEWIS AND CLARK CAVERN NAT'L MON
36 LINCOLN'S BIRTHPLACE NAT'L PARK
37 MESA VERDE NAT'L PARK
38 MONTEZUMA CASTLE NAT'L MON.
39 MOUND CITY GROUP NAT'L MON.
40 MOUNT OLYMPUS NAT'L MON.
41 MT. RAINIER NAT'L PARK
42 MUIR WOODS NAT'L MON.
43 NAT'L BISON RANCH NAT'L MON
44 NATURAL BRIDGES NAT'L MON.
45 NAVAJO NAT'L MON.
46 OREGON CAVES NAT'L MON.
47 PAPAGO SAGUARO NAT'L MON.
48 PETRIFIED FOREST NAT'L MON
49 PINNACLES NAT'L MON.
50 PIPE SPRING NAT'L MON
51 PLATT NAT'L PARK
52 RAINBOW BRIDGE NAT'L MON
53 ROCKY MTN. NAT'L PARK
54 SCOTT'S BLUFF NAT'L MON
55 SEQUOIA NAT'L PARK
56 SHENANDOAH NAT'L PARK (PROPOSED)
57 SHILOH NAT'L PARK
58 SHOSHONE CAVERN NAT'L MON
59 SULLY'S HILL NAT'L PARK
60 TIMPANOGOS CAVE NAT'L MON.
61 TONTO NAT'L MON.
62 TUMACACORI NAT'L MON
63 VERENDRYE NAT'L MON.
64 VICKSBURG NAT'L PARK
65 WALNUT CANYON NAT'L PARK
66 WHEELER NAT'L MON.
67 WIND CAVE NAT'L PARK
68 YELLOWSTONE NAT'L PARK
69 YOSEMITE NAT'L PARK
70 YUCCA HOUSE NAT'L MON.
71 ZION NAT'L PARK

Rand McNally
JUNIOR
Auto Trails Map
OF THE
UNITED STATES

TRAIL & HIGHWAY MARKINGS

1 MISS. RIVER SCENIC HY. — BLUE ON WHITE
2 LINCOLN HIGHWAY — RED, WHITE, BLUE
3 JEFFERSON HIGHWAY — BLUE BANDS, BLACK "H"
4 YELLOW-STONE TRAIL — YELLOW RIBBON
5 KING OF TRAILS — BLACK ON YELLOW
6 NAT'L OLD TRAILS ROAD — RED, WHITE & BLUE
7 LONE STAR ROUTE — RED ON WHITE
8 THEO. ROOSEVELT INT. HY — RED, WHITE, BLUE
9 LEE HIGHWAY — BLUE & GRAY
10 OLD SPANISH TRAIL — RED WHITE YELLOW BLUE BLACK LETTERS
11 NAT'L PARK TO PARK HY — BLACK ON WHITE
12 DIXIE OVERLAND HY — RED ON WHITE, BLUE
13 MISS. VALLEY HIGHWAY — WHITE ON BLUE
14 BANKHEAD HIGHWAY — YEL. WHITE YEL. BLACK LETTERS
15 PIKES PEAK "O to O" HY — RED WHITE BLUE
16 MERIDIAN HIGHWAY — RED LETTERS ON WHITE
17 MIDLAND TRAIL — BLUE, WHITE, RED
18 EVER-GREEN NAT'L HY — BLACK ON WHITE
19 ATLANTIC PACIFIC HIGHWAY — BLUE, WHITE, RED
20 CALIF. BANFF B LINE — BLUE ON WHITE
21 OZARK TRAILS — GREEN BANDS & LETTERS
22 BLACK & YELLOW TRAIL — BLACK ON YELLOW
23 CUSTER BATTLE-FIELD HIGHWAY — RED & WHITE, BLACK LETTERS
24 DIXIE HIGHWAY — BLACK ON YELLOW
25 DETROIT LINCOLN DENVER — BLACK ON WHITE
26 COLO. TO GULF HIGHWAY — WHITE, RED, BLACK LETTERS
27 VICTORY HY — BLUE & YELLOW ON WHITE
28 HARDING HY — BLACK ON WHITE

NATIONAL PARKS & MONUMENTS

1 CHEO RUIN NAT'L MON.
2 CHIETAM BATTLE FIELD NAT'L MON.
3 CHIDELIER NAT'L MON.
4 CHOLE BATTLE FIELD NAT'L MON
5 CHOE CANYON NAT'L MON
6 CHURILLO NAT'L MON.
7 CHULIN MCUNTAIN NAT'L MON
8 CHLSBAD CAVE NAT'L MON
9 CHA GRANDE NAT'L MON.
10 CHOO CANYON NAT'L MON.
11 CHCAMAUGA AND CHATTANOOGA NAT'L PARK
12 CHICAHUO NAT'L MON.
13 CHORADO NAT'L MON.
14 CHTER LAKE NAT'L PARK
15 CHTERS OF THE MCNON NAT'L MON
16 CHTER BATTLE FIELD
17 CHL POSTPILE NAT'L MON
18 CHL'S TOWER NAT'L MON
19 CHOSAUR NAT'L MON.
20 CHORRO NAT'L MON.
21 CHSIL CYCAD NAT'L MON.
22 CHERAL GRANT NAT'L PARK
23 CHTYSBURG NAT'L PARK
24 CHCLIFF DWELLINGS NAT'L MON.
25 CHIER NAT'L PARK
26 CHND CANYON NAT'L PARK
27 CHV QUIVIRA NAT'L MON.
28 CHFORD COURTHOUSE NAT'L MON.
29 CHSPRINGS NAT'L PARK
30 CHENWEEP NAT'L MON.
31 CHEL CAVE NAT'L MON.
32 CHAYETTE NAT'L PARK (MT. DESERT ID.)
33 CHEN VOLCANIC NAT'L PARK
34 CHMAN CAVES NAT'L MON.
35 CHS AND CLARK CAVERN NAT'L MON
36 CHOLN'S BIRTHPLACE NAT'L PARK
37 CHA VERDE NAT'L PARK
38 CHTEZUMA CASTLE NAT'L MON.
39 CHND CITY GROUP NAT'L MON.
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67 WIND CAVE NAT'L PARK
68 YELLOWSTONE NAT'L PARK
69 YOSEMITE NAT'L PARK
70 YUCCA HOUSE NAT'L MON.
71 ZION NAT'L PARK

WITHIN 500 MILES of
1 station
2 stations
3 stations
4 stations

Rand McNally
JUNIOR
Auto Trails Map
OF THE
UNITED STATES
COPYRIGHT BY RAND McNALLY & COMPANY

G-41

64:21
Box 1
FF 12

Davis, H. P. Memoranda proposing organization of a broadcasting company, 1925

Davis, H. P. 1868-1931. Papers, 1915-1944.

Yellow 2

The Permanency of Broadcasting

How A Scientific Novelty Developed In Eighteen Months to a Necessary and Popular Service — Present Limitations and the Line of Future Extension

By H. P. Davis

IT is always unsafe to assume the role of a prophet, but the writer presumed to take such a chance more than a year ago when in a published article he made the following statements:

"The adaptability of the radiophone to broadcasting reports, news, entertainments, concerts, lectures, etc., creates a field particularly its own, and it is reasonably certain that the future will see many changes in the present accepted methods of conducting such functions and entertainments. It is quite possible that especially constructed transmitting rooms will be provided for such purposes, so that voices and music will be broadcasted through unbounded areas and listened to by invisible and widely distributed audiences of vast numbers. The same opportunities would thus exist for the country dweller as for the city resident, and inmates of hospitals and sanitariums, and sick people and invalids in the home would have opportunities for pleasures and diversions now denied them. A transmitting system of this character would have the further great advantage of doing away with the necessity of appearing in person in public halls and auditoriums, the capacities of which at best are quite limited.

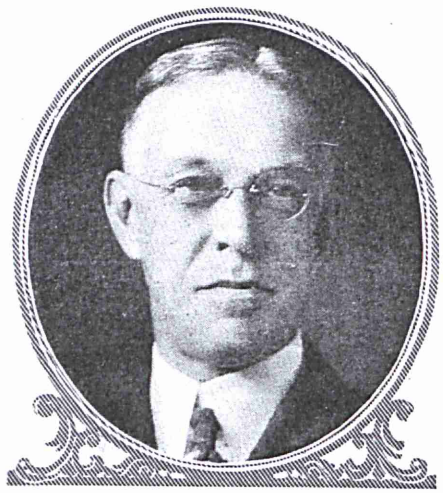
"The importance of reaching such tremendous numbers of people, with practically no effort, offers great possibilities for advertising and the distribution of news and important facts, and in reality introduces a 'universal speaking service.' It is not unreasonable to predict that the time will come when almost every home will include in its furnishing some sort of loud-speaking radio receiving instrument, which can be put into operation at will, permitting the householder to be in more or less constant touch with the outside world through these broadcasting agencies.

"The field of radio application is practically unlimited in the important affairs of the world, and this development will mark one of the great steps in the progress and evolution of mankind."

What is the situation today? In a period of wide-spread business depression, and thus a most inauspicious one for a new venture, radio is a topic of as universal interest as the weather; and the spell of radio broadcasting especially is becoming world-wide.

It is probably a fact that no facility or service has ever received such instant response from the public or has grown so fast in popularity, and at a time when the public buying power was generally believed to be nil, a market has been developed which is limited only by the ability of manufacturers to supply apparatus.

Civilization progresses in direct ratio to the advance in communication and transportation facilities, and the public



H. P. Davis, Vice-President of the Westinghouse Electric and Manufacturing Company

is quick to recognize and seize upon, and make use of, any new developments in either of these services. In a sense, radio broadcasting as a service has opened a new field for public communication, and what has been more or less of a scientific novelty, or possibly a visionary dream, has become almost overnight an accomplished fact and a wide-spread and necessary popular service.

It is fascinating in its mystery, and this is undoubtedly one of the greatest attractions in its first appeal to the imagination. But it is destined to be something more than a fascinating novelty, for as the possibilities of radio unfold we see before us a wonderful and permanent public service comparable with other modern facilities and conveniences in its ability to make life easier and better. Radio annihilates distance, reducing it to nothing, since the element of time scarcely enters into the speed of the transmission and can be entirely disregarded when it is possible to encircle the globe in a small fraction of a second with a radio wave.

We all realize that the interest of the public is fickle and that the mystery of this wonderful agency will wear off as it ceases to be a novelty, but even admitting that, the element of permanency is present in radio broadcasting. This is evidenced by the thousands of letters that have been received from the radio audiences, of which the following are samples:

"I'm an old lady, almost blind, 75 years old. My youngest grandson, an 18-year-old senior in high school, installed one of your radio sets for me last Monday, March 20, and I have enjoyed three fine concerts and two noon-hour services at Trinity Church. You are doing much good and giving great pleasure to the many, many 'shut-ins' like myself."

"We are located up on the lonesome mountains of Southeastern Kentucky. We listened in on your program last evening, and we certainly appreciate this very excellent music. We are about 200 miles from any large city, so you will understand why this is such a great treat to us and our miners."

"We enjoyed every bit of Tuesday night's program, but especially the talk given by the 'Bird Man.' We are country people and you know we live very near to nature, so his talk of the birds was very interesting to us. We are thankful to have lived to see this possible and we are surely indebted to you people who make it so. Being elderly people and during the winter's bad weather not often able to get out, it is a very great thing for us to be able to enjoy such things by radio."

Half our population resides in the country, and conditions similar to those recited in these letters will prevail. But consider also what it means to the sick, the infirm and the aged, even though they may be residents of the cities.

The broadcasting of church services alone, which was initiated by KDKA, the Westinghouse Electric and Manufacturing Company's broadcasting station at East Pittsburgh, Pennsylvania, would in itself be sufficient to make radio broadcasting permanent and invaluable. This service met with instant response, for it was at once unique and compelling it its appeal to people of all ages, classes and denominations, and is proving to be one of the greatest publicity and beneficent features ever presented; it is doing more to enlarge the church's sphere of

influence than any medium heretofore utilized.

As radio broadcasting is developed today it has one feature not possessed by any other service in existence, and except for the comparatively small cost of the initial installation, it is without favor and without price. Everyone can occupy a "free reserved seat" at any and every radio broadcasting performance. This is an important fact not generally recognized, for while one large electrical manufacturing company initiated the service and several companies are now maintaining broadcasting stations, the only financial support they receive for this costly service is the possible profit from the sale of receiving apparatus of their manufacture; but there are hundreds of other manufacturers and dealers who are manufacturing and selling receiving apparatus also, who do not support this service in any way whatever and who, because of this service, reap large benefits without exertion or expense on their part.

It is doubtful if there is any way in which this service can be made a direct revenue producer for such companies or institutions as foster it. Recognizing this fact, there must then be developed sufficient indirect value to those maintaining radio broadcasting stations to make it profitable for them to operate and develop this service.

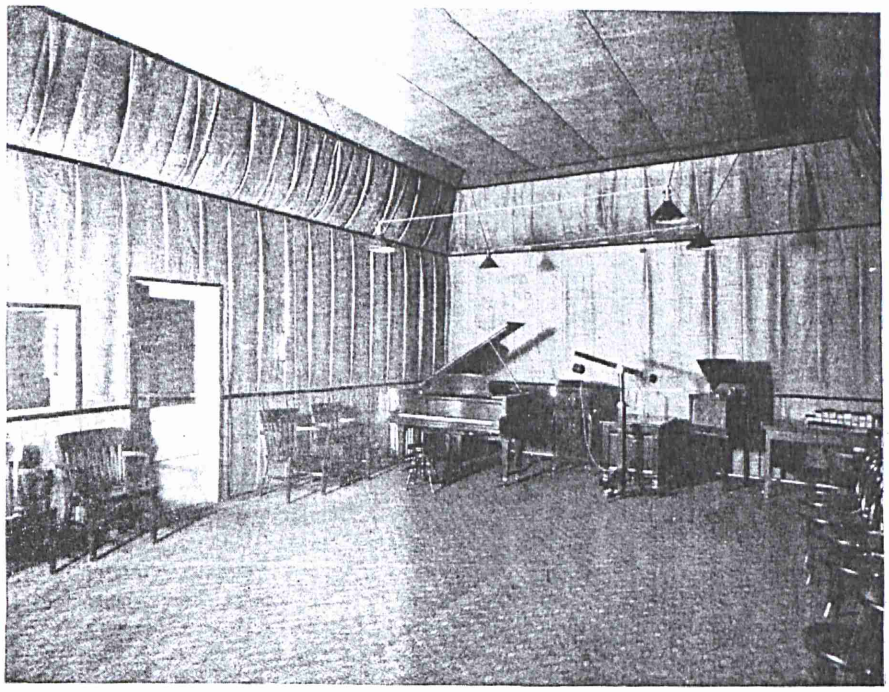
To the uninitiated it probably seems a simple matter to install a radio transmitting outfit and to broadcast music and speech and thus call the installation a broadcasting station. KDKA has now been in operation since the early part of November, 1920, and as the pioneer in radio broadcasting service, has made history in the development of the radio broadcasting art. It will be difficult for anyone now sitting at a receiving instrument to realize the amount of development work and expense that has been attached to bringing that station to its present effectiveness, but I am quite sure that if it were possible to compare what was considered good broadcasting a year and a half ago, and what is being transmitted today, it would at once be evident that a wonderful improvement has been brought about.

There are still considerable limitations in the ability of the available broadcasting apparatus to transmit talk and music tones true to life, and ultimate perfection of trueness is only attained when the listener receives what is broadcasted in the natural reflection and without distortion. Much thought is being given and work done to reach this perfection, and it is the writer's belief that very material steps of advance in this will be forthcoming shortly.

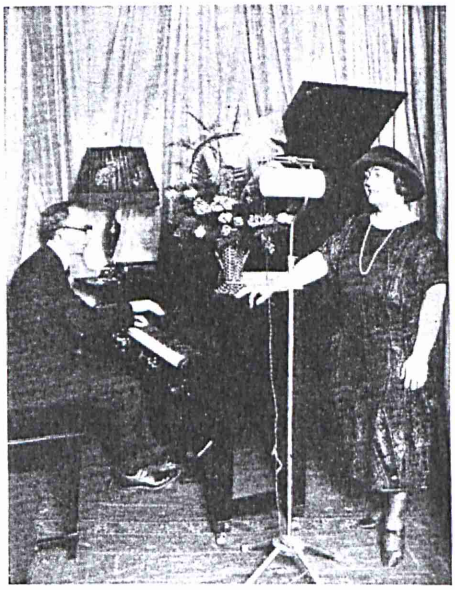
Our apparatus and means for radio broadcasting are today undeveloped, and if greater perfection is to be attained, confusion, with resultant public disgust, must be prevented; so protection of some kind is due those who foster and develop this service.

Recognizing that inefficient and interfering service will not be tolerated, the Government has already taken preliminary steps to formulate regulations with a view to materially improving this situation, in the recent conference held in Washington under the auspices of the Department of Commerce. As the conditions of service and the requirements of the public become better appreciated, means will be found to attain this end.

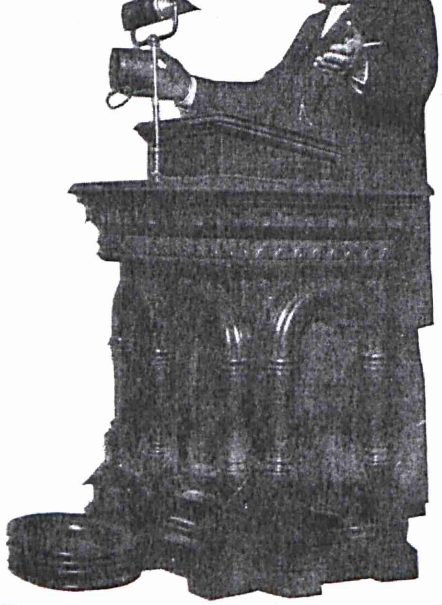
There are comparatively few available wave lengths in the ether, and to encourage this very necessary development these ether wave bands must be allocated and administered with much discrimination and care. Only companies or institutions with competent research and operating staffs, and financial means to back them, can possibly support this service in a proper manner and accomplish this most desirable perfecting of radio broadcasting. In other words, radio broadcast-



The specially constructed studio at KDKA station which realizes the prophecy of a year ago that such rooms would be provided for broadcasting stations



The transmitting microphone at WJZ into which great artists sing represents months of laboratory research and operating development



When W. J. Bryan speaks nowadays over the radio a quarter-million people hear the great Commoner

ing is an infant industry and it must have protection, and if this is properly and conservatively done we shall hold the public support and shall look back in a very short time in amazement at what has been accomplished.

It is unfortunate, however, that this imperfection of the sending apparatus is not as fully realized as it should be, with the result that many new broadcasting stations are being planned which must necessarily give only mediocre results. Not only is the ether going to be crowded, but crowded with discordant and disagreeable performances.

I feel that this period is going to be the test of the public's approbation. The growth of the public approval has been too rapid to be healthy, as it outstrips the growth of the development of the art, and while the fascination of broadcasting is the impelling force now, the period of development of not only the apparatus, but of the service itself is going to require patience and forbearance on the part of the public.

The same situation confronts this service as has been encountered in all other innovations or great steps of progress, and that is the attitude of those in allied established activities to look upon the newcomer as a rival which is to be regarded with suspicion and gauged in a competitive sense.

It is easy to see from what has been said herein that there is little or no revenue-producing opportunity in this service, and that the value attached to it is almost wholly one of advertising. Until this is realized and appreciated by those who must furnish the talent for the program, however, more or less difficulty will be experienced in perfecting and broadening the program service, and the attitude now being met on the part of a few lecturers, artists, theatrical and concert managers who refuse their assistance for fear of adversely affecting their box-office receipts and of reducing their earning capacity, must be converted to an appreciation of its advertising value — not as a destructive, but as a constructive agent; for if advertising in any way has been a benefit in helping the growth of such undertakings, the far greater advertising possibilities in radio broadcasting must undoubtedly bring greater returns for the amount of energy expended than any other agent yet available.

Undoubtedly, however, if this service is to fulfill its mission, ways will be devised to overcome this difficulty; for in this case as in other cases of unusual developments, it will eventually be found that, instead of being a competitor, radio broadcasting becomes a source of development and extension to the other arts. A service which offers such possibilities must in the future wield a tremendous influence, and overcome obstacles which now beset its path.

In broadcasting, radio has found its greatest usefulness and its most important field of application, and it is destined to become a basic public service. The road is a rough one, however, as many of us who have been intimately connected with its development are realizing.

Radio and the Phonograph Dealer

Abstracts of an Editorial From "The Talking Machine Journal," Showing How Radio Will Help the Phonograph Business

THE big new idea in the talking machine field is Radio-Telephony. Like all big new ideas it is fraught with blessings or — blow-ups. When we contemplate the fact that in a time when all other businesses were moving with extreme slowness, or were actually at a standstill, radio-telephony sprouted up to a towering height in just a few months, we must admit that it has great force in it. But on the other hand, has it real strength and staying power? Granted that it has stability and a future, what does it mean to the talking machine dealer, and how should he connect himself with it? How should he plan today?

In considering radio and its possibilities, merchants should bear one thing steadily in mind—that they are in the phonograph business. The phonograph business is firmly established as a part of the commercial structure of this country. The recent census department report gives figures showing that only the automobile business rivals the phonograph business in the volume of sales — with two and a quarter million machines made and marketed in 1919 — and over two-thirds that number produced last year, admittedly an off year. Hence it becomes a question of the old and established business brother holding out a helping hand to the newly arrived child of commerce.

The point of view should be that the dealer should interest himself in the possibilities of radio because it can help his phonograph business, and, viewed from the other side, because he is the one merchant who is today properly equipped in his store and his business experience to distribute this type of goods and more particularly the type of goods that is being rapidly developed, namely the cabinet installed sets, particularly those combining phonograph and radio equipment.

At present there seems no chance for competition between broadcasted radio music, and the fine reproductions of artists to be had on the records. A fraction of the family's "listening time" may be absorbed by the radio outfit, but in general what they hear will stimulate a desire to own a smooth and artistic reproduction of the selection that they can put on their phonograph and hear through without interruption at any time they wish. This is without prejudice to the fact that radio contributes many individual and interesting features of its own to the home entertainment. Phonograph dealers should take hold of radio both for its present and for its future, going ahead conservatively and making sure that they have allied themselves with only standard and reliable lines. Plunging in the ordering of goods is not justified. The point is not so much to get goods as to get the proper kind. A few bad outfits will damage the entire proposition in your neighborhood. Radio is here to stay, and the dealer who proceeds cautiously with it, from the point of view of developing his phonograph business, will make more and better sales than the one who rushes in without proper consideration of the pitfalls as well as the profits.

Scene: Movie house in Kokomo.
Time: Nineteen twenty something.
Idea: Movie houses have installed radio. Three thousand get their music from Chicago orchestra.

We see the villain approaching the country lassie. Evil is written all over his face. The girl is frightened. He grabs her. They struggle furiously. Just as the fight is at its height, something slips in the music synchronizer and there bursts inappropriately forth from the radio receiver:

"Dapper Dan, der Pullman Porter man,
On a train that ran through Dixie."

MANAGEMENT ENGINEERING

THE JOURNAL OF PRODUCTION

L. P. ALFORD, *Editor* E. W. TREE, *Associate Editor*

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Radiphone instruments

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Putting Radio Instruments Into Production

By HARRY PHILLIPS DAVIS*

Vice-President Westinghouse Electric and Manufacturing Co.

TO develop an engineering and commercial enterprise out of the radiophone, it was necessary to attack and solve the problem of changing a scientific electric novelty into an instrument of public service, and of making it useful and usable in a new field of communication. Fundamentally, the radiophone does not lend itself to private communication, but has the possibility of universal usefulness. Through it one can communicate at the same time with hundreds, thousands, or even millions of people, the only prerequisite being that the one who listens shall have a suitable "ear" tuned to receive whatever is sent. The development of this possibility in the past two years has brought into being a new industry.

During the war, Frank Conrad, assistant chief engineer of the Westinghouse Electric and Manufacturing Company, was licensed to operate one of the few amateur stations permitted during the period of hostilities. This station was utilized in the interest of government work which the Westinghouse Company was doing and to test out apparatus. This station was very well known to amateur radio enthusiasts throughout the country. Mr. Conrad had been in the habit of operating it intermittently since the war to send out phonograph records by radio on certain evenings. A department store selling amateur radio equipment made use of this fact by including in its advertisement in one of the Pittsburgh newspapers this sentence: "Mr. Conrad will send out phonograph records this evening."

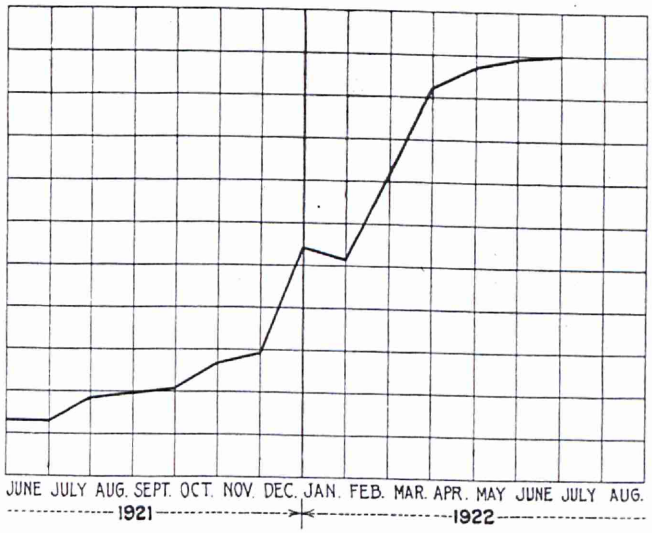

FIG. 1 PUBLIC INTEREST IN RADIO AS REFLECTED THROUGH THE AMERICAN NEWSPAPERS

From this came the idea of a public broadcasting service which would make available to all within range, music, news, information, and entertainments.

The possibilities of such a broadcasting service were sensed in September, 1920, and on November 11 of that year the Westinghouse Electric and Manufacturing Company's broadcasting station in East Pittsburgh—KDKA—was opened. Within less than a year three other such stations were set up: Newark, New Jersey, in April, 1921, WJZ; Chicago, Illinois, in August, 1921, KYW; and Springfield, Massachusetts, in September, 1921, WBZ.

These four stations were all pioneer stations in a way, for during the first year progress in developing public interest was slow. However, when transmission conditions became good, in the fall and early winter of 1921, public interest developed so rapidly that it practically became a craze. As a result, there was a rush to establish broadcasting stations, and there are now over 300 such stations in the United States, and the

* Mr. Davis was graduated from the Worcester Polytechnic Institute in 1890, and after a trip to Europe and a few months spent with the Thompson-Houston Company, entered the Detail Engineering Department of the Westinghouse Electric and Manufacturing Company in 1891. In 1896 he was placed in charge of this department; in 1908 he became manager of the Engineering Department. This position he held until 1911, when he was elected Vice-President of his company.

Mr. Davis is not only a designing engineer of high rank with 77 patents on electrical apparatus to his credit, but he is also a man who gets things done. During the war he was in charge of production at the East Pittsburgh works, and upon him devolved the duty of satisfying the government contracts for munitions. Not a single promise made to the government was broken in carrying through that colossal manufacturing task.

radiophone audience numbers into the millions each night. Fig. 1 shows the increase in public interest in radio during the past year.

The establishing of these stations, which broadcast to the public, provided a definite service which could only be taken advantage of by the possession and use of radio instruments. As soon as the service became available the public demanded such instruments. These have been supplied through two channels, the manufacturing and marketing of carefully designed, constructed, and tested instruments, and the supply of parts from which amateurs can build their own. It is estimated that up to the present more than 300,000 instruments have been manufactured, of which the Westinghouse Electric and Manufacturing Company has produced a few more than one-third. It is estimated further that fully as many instruments constructed by amateurs are in use. This tremendous development has taken place in about 14 months. In June, 1921, the East Springfield plant of the Westinghouse Company produced 404 radiophone instruments. During the present month, August, 1922, the output will be upward of 25,000.

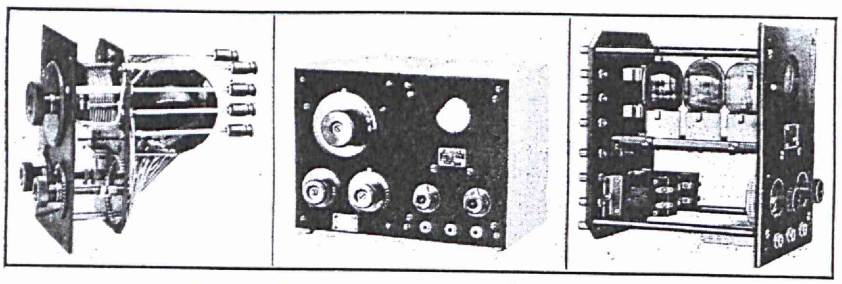

FIG. 2 EARLY TYPE OF RADIOPHONE SET

These exterior and interior views are of one of the first sets made by the Westinghouse Electric and Manufacturing Company.

This development is unquestionably one of the high-water marks of rapidly increasing demand and production in an article for general use. It is believed that the money value of radio equipment already sold far exceeds the value of the automobiles produced during the like period of the development of that new means of transportation.

The problems of production may be understood when it is realized that up to the time that the Westinghouse Electric and Manufacturing Company developed its first model and put it into the manufacturing departments no instrument of this design had ever been produced on a manufacturing basis. Involved, therefore, in the problem were all of the difficulties concerned with bringing out the initial design of a new piece of apparatus, adapting it to its uses, acquiring knowledge and skill for its production, securing the necessary manufacturing equipment, training workers to new tasks which were not even known by the executives in charge—in short, blazing through all of the problems of producing something which had never before been made in quantities and by manufacturing methods. That these problems were successfully solved is proved by the record of production already cited. Other proof is found in the facts that in the East Springfield plant alone 100,000 square feet of floor space are devoted to the production of radio equipment, that over 900 persons are employed on this work, and that their efforts are supplemented by an equal number at other works of this company. Between March 17 and June 6, a new radio building was constructed at East Springfield, 500 ft. long and 80 ft. wide, to give increased manufacturing space.

One factor which has contributed greatly to this

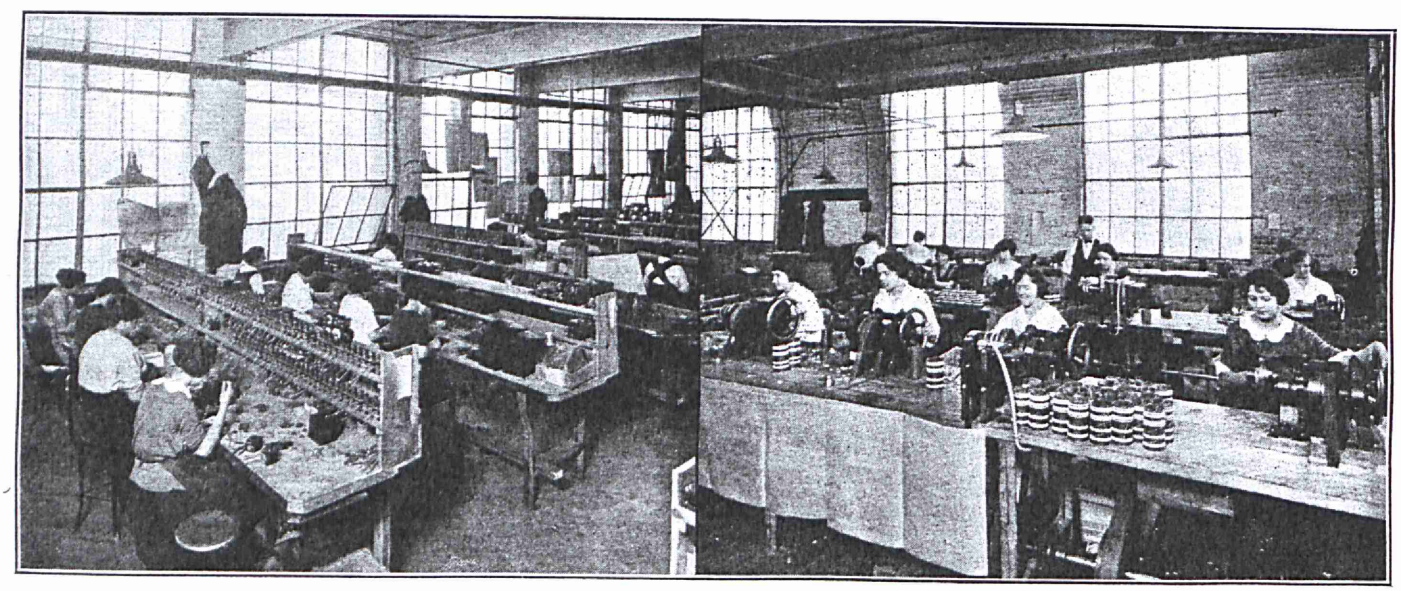

FIG. 3 ASSEMBLING AERIOLA JUNIOR INSTRUMENTS

There are 20 operations in this assembly and 15 separate parts. The assembling of the tube block is difficult and exacting. The girls average to produce 240 instruments per day; about two weeks is required to train a girl.

FIG. 4 WINDING COILS FOR AERIOLA JUNIOR INSTRUMENTS

In each coil there are 74 turns of wire. The girls average 100 stationary coils or 400 rotary coils per day. The average time required to train a girl for this work is from a week to 10 days.

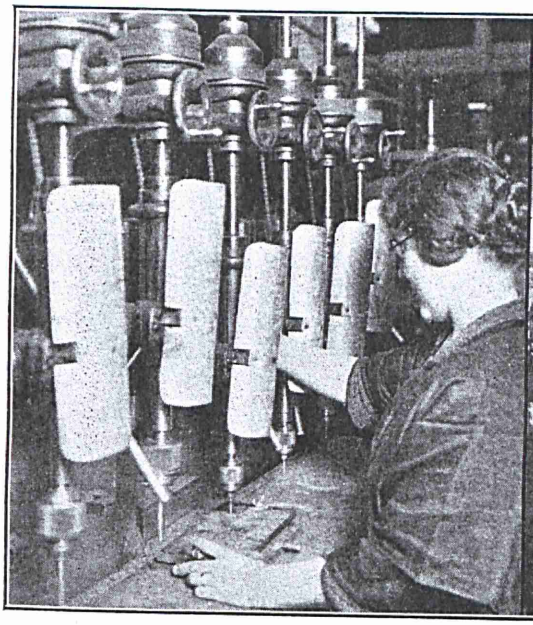

FIG. 5 DRILLING SUB-PANELS FOR RA TUNERS
Fifty-nine holes are drilled in each panel with an average output of 130 pieces per day.

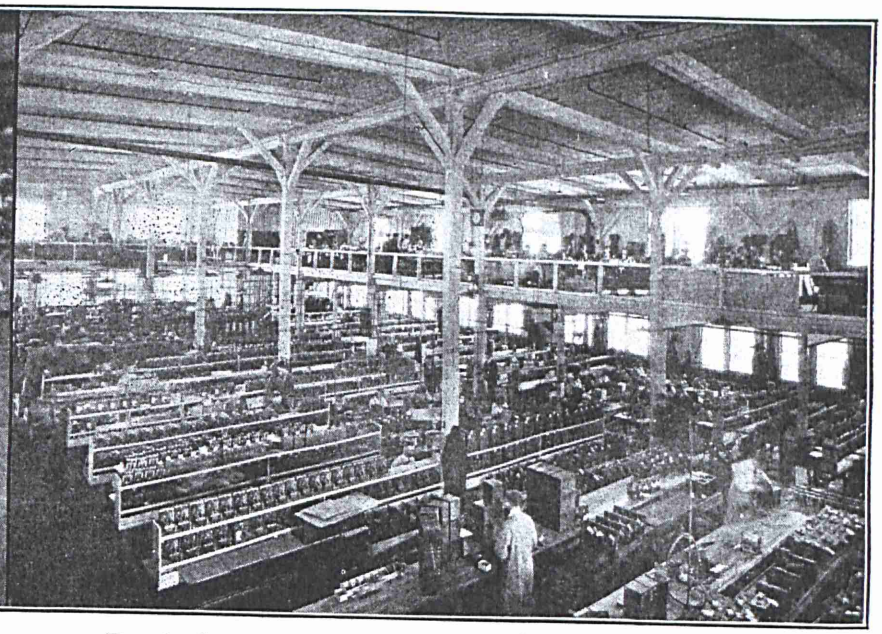

FIG. 6 GENERAL VIEW OF THE MANUFACTURE AND ASSEMBLY OF RC, DA, AND RA SETS
Three hundred and fifty persons are employed on this work, producing in all of the three 420 units per day.

record is the fact that the first design of a tuner put into production was a good one. Usually a new device or piece of apparatus must pass through an experimental stage before it functions successfully. This was not true of the tuner as first made. It is being turned out today according to the original design, the only modifications being in details to permit of easier manufacture. This instrument was followed by later designs, theAeriola Junior with a radius of 25 miles in May, 1921, the Aeriola Senior with a radius of 200 miles in January, 1922, and the Aeriola Grand with a radius of 750 miles in January, 1922.

To emphasize that the design has not changed, Fig. 2 shows one of the first tuners manufactured in East Pittsburgh in January, 1920. It will be noted that the characteristic front of the first instrument has been preserved in those which have followed. This external similarity holds throughout the design of the working parts of the instruments.

Turning now to actual production, it was decided to produce these instruments at the East Springfield plant to increase the diversity of work at that place. No one in the manufacturing organization had any previous experience in making radio equipment, so the experimental work in connection with production was more troublesome than that connected with the design and functioning of the instruments themselves. Inasmuch as the demand was unknown at the time production commenced, for at that time the design situation was not demonstrated, the first few instruments were

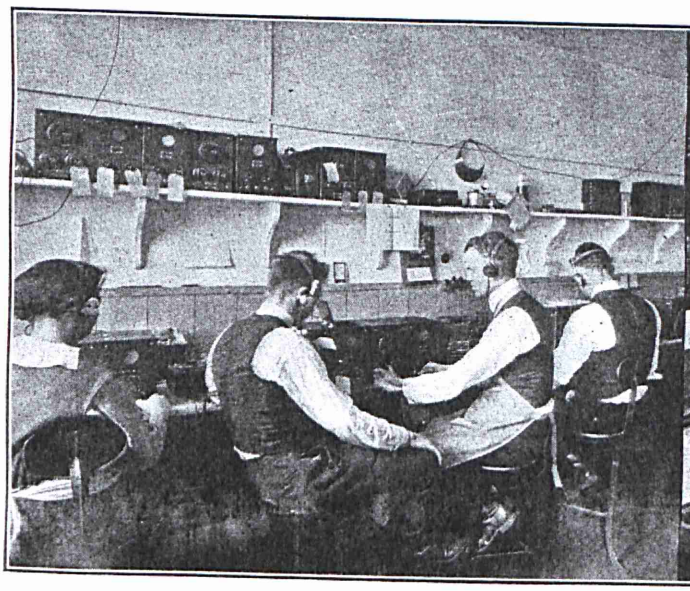

FIG. 7 TESTING-ROOM FOR RC SETS, DETECTORS, AMPLIFIERS, TUNERS, AND TRANSFORMERS

FIG. 8 FINAL OPERATIONS ON ASSEMBLING AERIOLA JUNIOR INSTRUMENTS

produced using the simplest kinds of tools, hardened templets without bushings for drilling, and vise jaws for milling. As it became apparent that the designs were settled and that some quantities would be necessary, these simple tools were replaced by well-designed tools for accurate production of interchangeable parts. Within the last few months the tool design has gone into a third stage to adapt it to large quantity production. Multiple jigs and milling fixtures have been built, multiple drilling machines selected, and some parts punched in quantity instead of being drilled. Still other parts are being produced from molded material instead of by machining methods. These changes, of course, have affected the machining operations, which, however, only involve about 20 per cent of the labor hours in producing radiophone instruments. By far the greater part of the producing time is taken up with assembling and testing. As an item of interest, 95 per cent of the instruments pass final inspection without any correction.

FIG. 9 FINAL TEST ON AERIOLA JUNIORS
The test is for wave length, ocillation, and audibility.

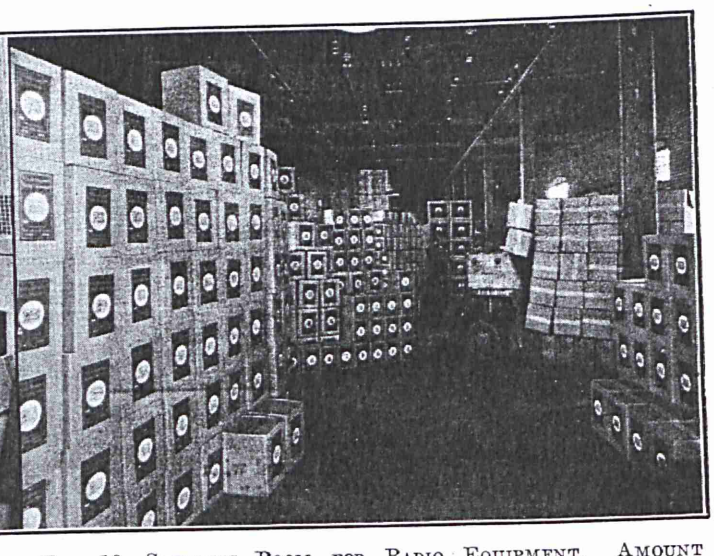

FIG. 10 SHIPPING ROOM FOR RADIO EQUIPMENT. AMOUNT SHIPPED PER DAY AVERAGES 10 TONS WITH A RECORD OF 18 TONS

A few of the manfacturing, assembling, and testing operations are shown in the illustrations, Figs. 3 to 10, inclusive.

To emphasize the value of experience in producing any fine product and to show some of the small points which may cause trouble but cannot be foreseen, the case of a micarta panel is of particular interest. In laying out these panels each one was marked at a certain place with a lead pencil. Later six holes for terminals were drilled in this region. For some time trouble developed in shore circuiting in these terminals and not until the pencil marks were noticed and erased was this difficulty overcome. Now wax pencils are used for all marking on radio parts.

Turning now to the record of output in detail, Fig. 11 shows graphically the estimated sales requirements beginning with February, 1921, and the corresponding factory production. A very sharp rise in the units requested by the sales department is recorded for December, 1921. This was occasioned by a limited amount of advertising of radiophones available for Christmas gifts. The unfortunate part of this section of the diagram is that production was unable even to approximately offset the demand. However, production has been increasing steadily, the quantities for the past few months being 13,315 instruments for April, 14,728 for May, in round numbers 19,000 for June and 21,000 for July.

As previously mentioned, the production for the current month will be upward of 25,000 instruments. These records visualize the public demand for radio apparatus which came into being only after a broadcasting service was made generally available.

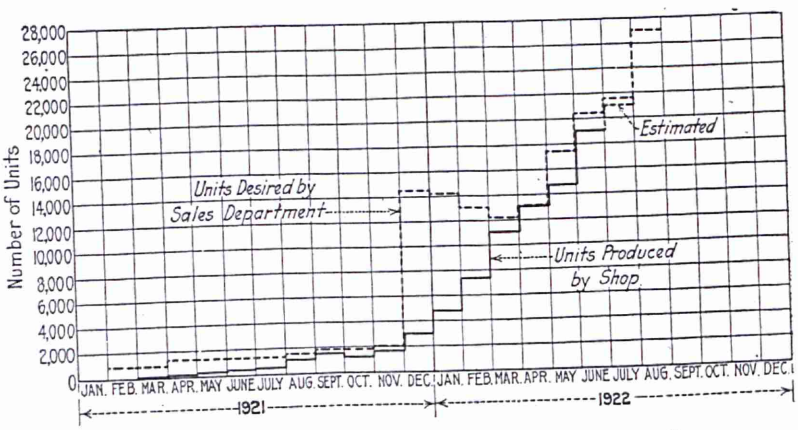

FIG. 11 SALES REQUIREMENTS AND FACTORY OUTPUT OF RADIO APPARATUS FOR 18 MONTHS
Included are tuners, amplifiers, RC sets, Aeriola Juniors, Aeriola Seniors, Aeriola Grands, and Tube Transmitters.

There are no signs of diminution of demand, but on the contrary, more and more apparatus is needed to satisfy the sales department requirements. As the economic uses for radiophones are enlarged we may expect to see this industry develop into one of the great branches of the diversified electrical business of the country.

Radio Telephone Broadcasting— A New Service

H. P. DAVIS
Vice-President. Westinghouse Electric & Manufacturing Co.

SIXTY-ONE years ago a prominent Boston newspaper published the following article:

"A man about 46 years of age, giving the name of Joshua Coppersmith, has been arrested in New York for attempting to extort funds from ignorant and superstitious people by exhibiting a device which he says will convey the human voice any distance over metallic wires so that it will be heard by the listener at the other end. He calls the instrument a 'telephone,' which is obviously intended to imitate the word 'telegraph' and win the confidence of those who know of the success of the latter instrument without understanding the principles on which it is based.

"Well-informed people know that it is impossible to transmit the human voice over wires as may be done with dots and dashes and signals of the Morse Code, and that, were it possible to do so, the thing would be of no practical value. The authorities who apprehended this criminal are to be congratulated and it is hoped that his punishment will be prompt and fitting, that it may serve as an example to other conscienceless schemers who enrich themselves at the expense of their fellow creatures."

Such was public feeling toward the telephone—not so long ago. Now radio is here.

Attempts had been made and some successful results had been accomplished, prior to the World War, in adapting telephonic principles to radio communication but it was not until 1920 that Westinghouse Electric & Manufacturing Company conducted its first spectacular radio program.

It happened that this was the presidential election year, and the happy thought occurred to us to open our station on the night of the election returns and to broadcast this news. Through the cooperation of Mr. Braun, the directing head of the Pittsburgh Post, a morning paper, and the Pittsburgh Sun, an evening paper, our plans matured with the decision to open on November 2, 1920, which we did, and the result was the historical broadcast by KDKA of the Harding election, the returns being gathered in the office of the Pittsburgh Post, in Pittsburgh, and from there telephoned to East Pittsburgh where they were relayed by another operator and broadcast by this new service.

A broadcasting station is a rather useless enterprise unless there is someone to listen to it. Here was an innovation, and even though advertised, few then, other than possibly some of the amateurs who had receiving sets, could listen to us. To meet this situation we had a number of simple receiving outfits manufactured. These we distributed among friends and to several of the officers of the company. Thus was the first broadcast audience drafted, and like all conscripts we found, as time went on, a difficulty in keeping this audience marshalled.

Mr. H. P. Davis has had thirty-seven years' active service in the electrical field with the Westinghouse organization. Since 1911 he has been in executive charge of all production and manufacturing in its numerous plants throughout the country and his untiring interest in radio has won for him the title, "The Father of Radio Broadcasting."

Broadcasting Begins

As a matter of historical record and sequence in the origin and progress of radio broadcasting as a public service, the following chronicle of events is important:

After a period of testing and experimental operation, the Westinghouse Electric & Manufacturing Company on November 2, 1920, at East Pittsburgh, Pa., put the first broadcasting station in the world, now known as KDKA, into operation, and transmitted as its first program the returns of the Harding presidential election. Following this, a daily program from 8:30 to 9:30 p. m. was immediately instituted. The daily schedule of the station has been continued without interruption up to the present time.

After nine months of continuous operation of station KDKA, the Westinghouse Company opened WBZ at Springfield, Mass., in September, 1921, followed on October 12, 1921, by WJZ at Newark, N. J., and on November 11, 1921, by KYW at Chicago, Illinois.

It was not until the summer of the next year that any other stations of prominence were placed into operation, and very few then, as it was a considerable time later that the great rush for wave-lengths took place and the confusion introduced that now exists in the broadcasting wavebands.

Radio and the World War

With the advent of the war attention was concentrated on such applications of radio as would be helpful in military operations, and the various governments engaged in the conflict enlisted the aid of all the large electrical companies that had facilities available.

The Westinghouse Electric & Manufacturing Company, having extensive research, engineering and manufacturing facilities of a nature suitable for this branch of electric science, was requested by the British government, shortly after the outbreak of the war, to undertake certain special work in radio. Considerable study on the part of Westinghouse engineers was devoted to this, but no special progress was made of a permanent character, as our own government began an attempt to develop such facilities, foreseeing the possibility of needing them later.

This activity took form in several fields. One, however, was the development of radio transmitting and receiving apparatus, both telegraphic and telephonic. In order to carry out this work it was necessary to have transmitting and receiving stations, and by special license from our gov-

ernment the Westinghouse Electric & Manufacturing Company was permitted to build and operate such facilities for experimental purposes.

Two stations were designed, equipped and operated during the war. One was located near its plant at East Pittsburgh, Pa., and the other at the home of Dr. Frank Conrad in the Pittsburgh residential district, a distance of four or five miles separating the two stations. The calls of these stations were 2-WM and 2-WE.

The writer was in charge of the Westinghouse Company's war activities. Dr. Conrad was then serving as one of his assistants and among other things was especially assigned to radio work. His work was very closely coordinated with that of the United States Signal Corps.

Dr. Conrad became very much engrossed in this work, and in characteristic manner began to do research, developing new ideas and making important advances in the art. As a result, a considerable amount of money was invested in this equipment and a large staff of experts organized.

With the end of the war, the company found itself with this investment and organization on its hands, and the re-establishment of patent restrictions, most of which were adversely held, placed the company in a position of considerable difficulty in continuing this work. The progress that had been made during the war period, however, encouraged it to continue. In casting about for a way to establish itself in the industry, a controlling interest was purchased in the International Radio Telegraph Company which owned many important fundamental radio patents.

The International Radio Telegraph Company owned and operated several ship-to-shore radio stations, and was a pioneer in this field. The operation and development of this service immediately became a part of the Westinghouse activities.

Seek to Develop Radio Service

A large sum of money having been expended for the control of the International Radio Telegraph Company emphasized in our minds the necessity for developing our new acquisition into a service which would broaden, popularize and commercialize radio to a greater extent than existed at that time, in order to earn some return on this investment as well as to keep the radio organization together.

In seeking a revenue-returning service, the thought occurred to broadcast a news service regularly from our ship-to-shore stations to the ships. This thought was followed up but nothing was accomplished because of the negative reaction obtained from those organizations to whom we desired to furnish this news material service. However, the thought of accomplishing something which would realize the service referred to, still persisted in our minds.

During this period Dr. Conrad had continued in his experiments with the station at his home and had greatly improved his radio telephone transmitter. Following the date on which government restrictions were removed from radio stations, Dr. Conrad quite regularly had operated this radio telephone transmitter to send out interesting programs of one kind or another, and to such an extent that people with receiving sets became sufficiently in-

(Continued on page 24)

Broadcasting Is the Proper Place for Advertising

THOMAS F. LOGAN
President, Lord & Thomas and Logan

I HAVE never had any doubt as to the proper place of advertising in broadcasting. It has just as legitimate and useful a place in the broadcast program as it has in the pages of our newspapers and magazines. None of us today would buy a newspaper that carried no advertising, for advertising is a business and buying guide of as great, and, at times, even greater value to us than the editorial contents. While advertising over the microphone must necessarily be of a different character than that which comes from the printing press, I think that the radio public is almost unanimously of the opinion that the radio programs sponsored by national advertisers are the most interesting and valuable features now on the air.

National advertisers, in a word, have quickly sensed how to make the right use of this new means of instantaneous and universal communication, performing a service to the public while they are serving themselves.

The question 'Who shall pay for the broadcasting?' has been definitely answered, and at the same time I think we have seen an end of the more or less academic debate as to whether broadcast advertising is acceptable to the radio audience. I do not say that all broadcast advertising is acceptable. Some of it is in such bad taste that it is bound to die a natural death, but the general average is very high.

The last question, and the crucial one in this category, is "Does broadcast advertising pay?" Well, the proof of the pudding is in the eating. There are at present on the air a total of fifty-seven nationally known firms sponsoring nation-wide radio programs regularly each week. Some of these have been on the air continuously since 1924, and only five outstanding advertisers have gone off the air after having definitely established themselves as users of the medium. That, it seems to me, is a very low mortality rate for a new advertising medium. Our own experience has shown that radio broadcast advertising, when properly planned and intelligently handled, is a highly valuable collateral means of building sales and good will. I say collateral, because newspaper or magazine advertising, or both, is the foundation upon which any profitable advertising campaign must be built. The microphone carries on where the printing press leaves off.

Take the newspapers, for example. Many publishers at the beginning looked upon radio broadcasting as a competitor in both news and advertising. The effect has been just the reverse, however. Newspapers are now enoying larger circulations and larger advertising revenues because of broadcasting. Advertising of radio in newspapers and magazines now approaches $20,000,000 a year, the greater part of which is spent in newspapers.

American editors quickly found that radio was just as much news to their readers as baseball or the stock market, and the great city dailies throughout the country are generous in their allocation of editorial space to daily radio programs and other news of the industry. One of our New York newspapers has on several occasions supplemented its own complete stories of big news events with verbatim reports of the broadcasting of these events.

Radio and the newspapers might conceivably have been competitors under a less enlightened management, but now they are working together side by side, each with a full understanding of their relations to each other and to the public.

Radio Telephone Broadcasting— A New Service

(Continued from page 8)

terested to listen to his station.

The program material available to although there were some talks, baseball and football scores. The station, whose call letters had been changed, was then designated as 8-XK and was known as one of the best amateur stations in the country.

Effect of Newspaper Ad

We were watching this activity very closely. In the early part of the following year the thought came which led to the start of a regular broadcast service. An advertisement of a local department store in a Pittsburgh newspaper, calling attention to a stock of radio receivers which could be used to receive the programs sent out by Dr. Conrad, caused the thought to come to me that the efforts that were then being made to develop radio telephony as a confidential means of communication were wrong, and that instead its field was really one of wide publicity. Right in our grasp, therefore, we had that service which he had been thinking about and endeavoring to formulate. Here was an idea of limitless opportunity if it could be "put across."

Decided to Start Station

Resulting from this was the decision to install a broadcasting station at East Pittsburgh and to initiate this service. This decision was made early in 1920, although it was not until fall that the equipment was ready for operation. In the interim, I had occasion to hold many interesting and now really historical conferences to plan our undertaking.

Dr. Frank Conrad, Assistant Chief Engineer, Mr. J. C. McQuiston, Manager of the Advertising Department, Mr. S. M. Kintner, Manager of Research Department, Mr. O. S. Schairer, Manager Patent Department, Mr. L. W. Chubb, Manager Radio Engineering Department, and Mr. M. C. Rypinski, Sales Department — all of the Westinghouse Electric & Manufacturing Company—participated in these conferences, and it was their experience, advice, constant faith and loyal efforts in the undertaking that carried the project to success.

Main Objectives

The main objectives which we laid down as basic have guided our radio broadcasting ever since, and were:

1. To work, hand in hand, with the press, recognizing that only by published programs could the public fully appreciate a broadcasting service.
2. To provide a type of program that would be of interest and benefit to the greatest number, touching the lives of young and old, men and women, in various stages and conditions of life.
3. To avoid monotony by introducing variety in music, speeches, etc.
4. To have distinctive features so timed as to assure their coming on at regular periods every evening. In other words, as a railroad does by its timetable.
5. To be continuous, that is, operate every day of the year. KDKA has operated without a break in schedule since the opening of the station.

First Studio on Roof

Our first broadcasting was from a rough box affair upon the roof of one of the taller buildings at the plant, which still stands there although no longer in use, and the development of the broadcasting studio is an interesting story.

In the first few months of operation of KDKA program material was drawn largely from phonograph records. It was recognized almost immediately by us, however, that no great interest or progress in broadcasting service would be possible if material differing from this type of entertainment were not available. The Westinghouse employes have always had a number of musical organizations, among them a very good band. We decided to broadcast this. Later, we organized the KDKA Little Symphony.

Our phonograph was operated in the room in which the transmitter was located, and the announcer and others who had taken part in the programs up to this time also had been using this room. With larger aggregations of talent, however, it was necessary to seek bigger quarters, so one of the auditoriums at East Pittsburgh was put into use. We immediately had difficulty in obtaining fidelity in the broadcast, due, apparently, to room resonance. To correct this, we thought of placing the band in the open air and to transmit from out-of-doors. When this was done the result was a marked improvement. As a result of this, we saw at once that if we wished to accomplish good sound reproduction, specially designed rooms would be required to broadcast from—but how, was not clearly apparent and in

(Continued on page 28)

Radio Telephone Broadcasting—A New Service

(Continued on page 24)

addition the expense incident to it was a serious problem.

As the warmer weather was approaching, we decided to broadcast our artists from this open air studio which, as before stated, was on the roof of one of the taller buildings of the plant. For protection we erected a tent. This proved good, and everything went along satisfactorily during the summer and early fall, until one night a high wind blew the tent away—and so our first studio passed out and into history.

Moved Studio Indoors

Necessity has always been the mother of invention, and having managed to keep our service going for nearly a year we could not think of discontinuing it because we had no studio—but we saw that we would have to go indoors. We, therefore, decided to try the tent inside. Part of the top floor of this high building was cleared and the tent "pitched" on this floor, and we were pleased to find that it worked as effectively as it had out-of-doors. Thus was the first indoor broadcasting studio developed.

The subject of a specially constructed studio, however, was again revived and designs prepared for it. Taking the lesson of the tent to heart, we draped the whole interior of the new studio with the cheapest material we had available—burlap. We had now all the elements of the present studio.

The principles that were originated by our experience have governed the design of the present-day studios, but the lowly burlap has changed it name to the more dignified name of monk's cloth. Other materials, however, have been developed in this intervening period, and the walls, ceilings and floors of studios are now built of materials which are non-resonant in character so that the use of monk's cloth is required less than formerly.

Public Interest Awakened

Radio broadcasting became a conversational topic as universal as the weather, and the spell of it became world wide. It is probably a fact that when the response came, no facility or service ever received such a reaction from the public or grew so fast in popularity, when the public was awakened to what it really was. When this happened, almost over night a scientific novelty and a hazardous experiment was transformed into a widespread and popular public service.

The History of Radio

By H. P. Davis,
Vice President, Westinghouse Electric & Manufacturing Co.

IT is hard even for one who has seen in his lifetime the awakening of this mighty colossus—asleep since the beginning of time—to realize the amazing achievements and developments of the twentieth century in mass communication. To you, of the present generation, the perspective is less clear, therefore not so intimate, and is looked upon more in a matter of fact way. Yet no longer than 61 years ago a prominent Boston newspaper published the following article:

"A man about 40 years of age, giving the name of Joshua Coppersmith, has been arrested in New York for attempting to extort funds from ignorant and superstitious people by exhibiting a device which he says will convey the human voice any distance over metallic wires so that it will be heard by the listener at the other end. He calls the instrument a 'telephone' which is obviously intended to imitate the word 'telegraph' and win the confidence of those who know of the success of the latter instrument without understanding the principles on which it is based.

"Well-informed people know that it is impossible to transmit the human voice over wires as may be done with dots and dashes and signals of the Morse Code, and that, were it possible to do so, the thing would be of no practical value. The authorities who apprehended this criminal are to be congratulated and it is hoped that his punishment will be prompt and fitting, that it may serve as an example to other conscienceless schemers who enrich themselves at the expense of their fellow creatures."

What a great progress has been made in so brief a period. Attempts had been made and some successful results had been accomplished, prior to the World War, in adapting telephonic principles to radio communication but it was not until 1920 that Westinghouse Electric & Manufacturing Company conducted its first spectacular radio program.

It happened that this was the presidential election year, and the happy thought occurred to us to open our station on the night of the election returns and to broadcast this news. Through the co-operation of Mr. Braun, the directing head of the Pittsburgh Post, a morning paper, and the Pittsburgh Sun, an evening paper, our plans matured with the decision to open on November 2, 1920, which we did, and the result was the historical broadcast by KDKA of the Harding election, the returns being gathered in the office of the Pittsburgh Post, in Pittsburgh, and from there telephoned to East Pittsburgh where they were relayed by another operator and broadcast by this new service.

A broadcasting station is a rather useless enterprise unless there is someone to listen to it. Here was an innovation, and even though advertised, few then, other than possibly some of the amateurs who had receiving sets, could listen to us. To meet this situation we had a number of simple receiving outfits manufactured. These we distributed among friends and to several of the officers of the company. Thus was the first broadcast audience drafted, and like all conscripts we found, as time went on, a difficulty in keeping this audience marshalled.

After a period of testing and experimental operation, the Westinghouse Electric & Manufacturing Company on November 2, 1920, at East Pittsburgh, Pa., put into operation the first broadcasting station in the world, now known as KDKA, and transmitted as its first program the returns of the Harding presidential election. Following this, a daily program from 8:30 to 9:30 P. M. was immediately instituted. The daily schedule of the station has been continued without interruption up to the present time.

Radio broadcasting became a conversational topic as universal as the weather, and the spell of it became world wide. It is probably a fact that when the response came, no facility or service ever received such a reaction from the public or grew so fast in popularity, when the public was awakened to what it really was. When this happened, almost over night a scientific novelty and a harzardous experiment was transformed into a wide-spread and popular public service.

The first real pick-up service ever attempted was that of the services of the Calvary Episcopal Church of Pittsburgh. Here, again, is an interesting story.

We had been sending out originally, as previously indicated, music and entertainment from phonograph records, and as we had determined to broadcast every day we naturally included Sunday. Our week-day form of program material did not seem quite suitable for Sunday evening purposes. Accordingly, we had a discussion about the matter and the happy suggestion was made—"Why not try to broadcast a church service?" But how?

After consideration of the difficulties involved, especially in picking it up, a plan was worked out which we felt would make the technical part possible. As music was the principal make-up of our program, our thought naturally gravitated to the Episcopal service. It so happened that one of our engineers was a member of the choir of the Calvary Episcopal Church in the East Liberty section of Pittsburgh. He was called in, the matter explained to him, and he promised to see what could be done.

We were to learn later that fortune was with us in this thought to the extent that the Rector of that church—Dr. E. J. van Etten, who is a broadminded, farsighted and progressive individual—immediately was interested in our proposal and a connection was formed then that has continued to the present day.

On January 2, 1921, the daring experiment was made of broadcasting the services of Calvary Episcopal Church. This was successful, and was so well received that it became a regular feature.

The broadcasting of church service alone was in itself sufficient to make radio broadcasting permanent and invaluable. The innovation was at once unique and compelling in its appeal to people of all ages, classes and denominations, and it has proved to be one of the greatest, most popular and beneficent features ever presented. Even today it is doing more to enlarge the church's sphere of influence than any medium heretofore employed.

But what of the future? Great innovations come infrequently, but often unexpectedly. No one ten years ago would have envisaged the actualities of today, yet we, who are closest to it, may presume to predict that in spite of the great developments to date the ground has scarcely been scratched, and that even more wonderful advances and possibilities are near at hand. Radio vision, whereby we shall see as well as hear by radio, is an accomplished fact; talking movies in the home. No more visionary than some of the actualities of today were a dozen years ago, is the possibility of the transmission of power by radio.

We who are now active may have to leave much of these future developments to others; still we can feel content, our-

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THE HISTORY OF RADIO

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selves, to have been a pioneer whose dreams and struggles have borne the cherished fruits of successful accomplishment—usually a sufficient reward, but in this instance many times amplified when we contemplate the greatness of the service and industry that has developed from the modest beginning I have recited to you today.

You have all heard of the famous statue of Memnon—out upon the shifting sands it sits, a calm is on its face, its voice forever hushed. But of old it spoke, and once each day, as each new sun arose, there came forth from its lips a sound. And worshippers came long pilgrimages and knelt in the sand to catch that sound, which was in their ears as a voice from Heaven.

So the voice of Radio comes to its devotees almost as a voice from another world. In fact, radio broadcasting has brought to humanity a new and heavenly vision, if not a new world.

* * * * * * * * * *

A SKETCH OF H. P. DAVIS, AUTHOR OF THE ABOVE ARTICLE

Among those who are actively directing the progress of the electrical industry today is Harry Phillips Davis, vice-president of the Westinghouse Electric & Manufacturing Company, in executive charge of all production and manufacturing of the Company in its numerous plants throughout the country, and in charge of all radio operations of the organization, manufacturing and broadcasting.

All achievement in the industrial field is due to inherent ability. This sometimes displays itself in the creation of works of great magnitude and sometimes in the perfection of detail. Mr. Davis' engineering genius is of the latter kind. Ever since his entrance into the electrical field, he has paid special attention to the so-called supply apparatus. To such devices as switches, insulators, and rheostats, he applied the same skill and care that is bestowed on the largest apparatus, and his work has had marked influence in raising the standards of electrical equipment.

Mr. Davis is known throughout the industrial field because of his achievements with electrical apparatus for industrial work. Through these accomplishments, he became noted among engineers and operators of industrial plants, but, within the past few years, his accomplishments have become known to practically ever man, woman and child in the United States and elsewhere who has developed an interest in radio, for Mr. Davis, through his initiative and foresight in the radio field, has won himself an enviable place in the history of radio, and is generally known as "The Father of Radio Broadcasting."

This title was conferred upon Mr. Davis because of his placing in operation the Westinghouse Electric Company's station, KDKA, the first radio telephone broadcasting station in the world established for the broadcasting of regular

History of Radio Broadcasting

Address delivered before School of Business Administration Graduates Harvard University

by the Father of Radio Broadcasting

The advances made by civilization have been very largely in proportion to the development of communications. Starting with mouth to mouth and eye to eye contact, progressively through the ages there has been a gradual evolution of mass communication, until, in our present day, it is exemplified and developed in many ways.

Mass Communication

It is hard even for one who has seen in his life-time the awakening of this mighty colossus—asleep since the beginning of time—to realize the amazing achievements and developments of the twentieth century in mass communication. To you, of the present generation, the perspective is less clear and therefore not so intimate, and is looked upon more in a matter of fact way. Yet no longer than 61 years ago a prominent Boston newspaper published the following article.

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The youngest but the most promising addition to these facilities for mass communication is radio broadcasting.

H. P. Davis, Vice-President Westinghouse Electric & Manufacturing Company, chairman of the Board of Directors, National Broadcasting Company, New York City.

Pre-War Experiments

Attempts had been made, and some successful results had been accomplished, prior to the World War, in adapting telephonic principles to radio communication. Reginald Fessenden, probably the first to attempt this, broadcast a program Christmas Eve 1906. Later, Mr. Lee DeForest did the same in the development of his apparatus. No real service, however was atempted or introduced of a character similar to that now known as radio broadcasting. The war bringing an end to independent development work, attention was concentrated on such applications of radio as would be helpful in military operations, and the various Governments engaged in the conflict enlisted the aid of all the large electrical companies that had facilities available.

British Government Requests Westinghouse Aid

The Westinghouse Electric & Manufacturing Company, having extensive research, engineering and manufacturing facilities of a nature suitable for this branch of electric science, was requested by the British Government, shortly after the outbreak of the war, to undertake certain special work in radio. Considerable study on the part of Westinghouse engineers was devoted to this, but no special progress was made of a permanent character, as our own Government began an attempt to develop such facilities, foreseeing the possibility of needing them later.

This activity took form in several fields. One, however, was the development of radio transmitting and receiving apparatus, both telegraphic and telephonic. In order to carry out this work it was necessary to have transmitting and receiving stations, and by special license from our Government the Westinghouse Electric & Manufacturing Company was permitted to build and operate such facilities for experimental purposes.

First Experimental Station

Two stations were designed, equipped and operated during the war. One was located near its plant at East Pittsburgh, Pennsylvania, and the other at the home of Dr. Frank Conrad in the Pittsburgh residential district, a distance of four or five miles separating the two stations. The calls of these stations were: 2-WM and 2-WE.

Your speaker was in charge of the Westinghouse Company's war activities. Dr. Conrad was then serving as one of his assistants and among other things was especially assigned to radio work. Dr. Conrad's work was very closely coordinated with that of the United States Signal Corps.

Dr. Conrad became very much engrossed in this work, and in characteristic manner began to do research, developing new ideas and making important advances in the art. As a result, a considerable amount of money was invested in this equipment and a large staff of experts organized.

With the end of the war, the Company found itself with this investment and organization on its hands, and the re-establishment of patent restrictions, most of which were adversely held, placed the Company in a position of considerable difficulty in continuing this work. The progress that had been

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HISTORY OF RADIO BROADCASTING—*continued from page 18*

made during the war period, however, encouraged it to continue. In casting about for a way to establish itself in the industry, negotiations were undertaken, and finally successfully concluded, whereby a controlling interest was purchased in the International Radio Telegraph Company which owned many important fundamental radio patents.

The International Radio Telegraph Company owned and operated several ship-to-shore radio stations, and was a pioneer in this field. The operation and development of this service immediately became a part of the Westinghouse activities.

A large sum of money having been expended for the control of the International Radio Telegraph Company emphasized in our minds the necessity for developing our new acquisition into a service which would broaden, popularize and commercialize radio to a greater extent than existed at that time, in order to earn some return on this investment as well as to keep the radio organization together.

In seeking a revenue-returning service, the thought occurred to broadcast a news service regularly from our ship-to-shore stations to the ships. This thought was followed up but nothing was accomplished because of the negative reaction obtained from those organizations whom we desired to furnish this news material service. However, the thought of accomplishing something which would realize the service referred to, still persisted in our minds.

Radio Telephone Transmitter

During this period Dr. Conrad had continued in his experiments with the station at his home and had greatly improved his radio telephone transmitter. Following the date on which Government restrictions were removed from radio stations, Dr. Conrad quite regularly had operated this radio telephone transmitter to send out interesting programs of one kind or another, and to such an extent that people with receiving sets became sufficiently interested to listen to his station.

The program material available to him was largely phonograph records, although there were some talks, baseball and football scores. The station whose call letters had been changed, was then designated as 8-XK and was known as one of

Dr. Frank Conrad, whose untiring research has at last made radio movies possible.

the best amateur stations in the country.

We were watching this activity very closely. In the early part of the following year the thought came which led to the initiation of a regular broadcast service. An advertisement of a local department store in a Pittsburgh newspaper, calling attention to a stock of radio receivers which could be used to receive the programs sent out by Dr. Conrad, caused the thought to come to me that the efforts that were then being made to develop radio telephony as a confidential means of communication were wrong, and that instead its field was really one of wide publicity. Right in our grasp, therefore, we had that service which we had been thinking about and endeavoring to formulate.

Possibilities for Public Service

Here was an idea of limitless opportunity if it could be "put across". A little study of this thought developed great possibilities. It was felt that here was something that would make a new public service of a kind certain to create epochal changes in the then accepted everyday affairs, quite as vital as had the introduction of the telephone and telegraph, or the application of electricity to lighting and to power.

We became convinced that we had in our hands in this idea the instrument that would prove to be the greatest and most direct mass communicational and mass educational means that had ever appeared. The natural fascination of its mystery, coupled with its ability to annihilate distance, would attract, interest and open many avenues to bring ease and happiness into human lives. It was obviously a form of service of universal application, that could be rendered without favor and without price.

Decision to Inagurate KDKA

Resulting from this was the decision to install a broadcasting station at East Pittsburgh and to initiate this service. This decision was made early in 1920, although it was not until fall that the equipment was ready for operation. In the interim, I had occasion to hold many interesting and now really historical conferences to plan our undertaking.

Dr. Frank Conrad, Assistant Chief Engineer, Mr. J. C. McQuiston, Manager of the Advertising Department, Mr. S. M. Kintner, Manager of Research Department, Mr. O. S. Schairer, Manager Patent Department, Mr. L. W. Chubb, Manager Radio Engineering Department and Mr. M. C. Rypinski, Sales Department—all of the Westinghouse Electric & Manufacturing Company—participated in these conferences, and it was their experience advice, constant faith and loyal efforts in the undertaking and the developments that followed that carried the project to success.

Co-operation of Newspapers

One of the earliest decisions was the necessity of building up and obtaining necessary public interest in our efforts through the co-operation of the daily press. It happened that we were most fortunately situated to accomplish this. Mr. A. E. Braun, the directing head of the Pittsburgh Post, a morning paper, and the Pittsburgh Sun, an evening paper, was an officer in the International Radio Telegraph Company, and the co-operation of these papers and his hearty support were immediately forthcoming. This, with Mr. McQuiston's acquaintanceship and contacts with other press channels, and his work with Mr. Braun, added much to building up the public interest which led to the final great success of the venture.

Birth of the Radio Program

The main objectives which we laid down as basic have guided our radio broadcasting ever since, and were:—

1. To work hand in hand with the press, recognizing that only by published programs could the public fully appreciate a broadcasting service.

2. To provide a type of program that would be of interest and benefit to the gratest number, touching the lives of young and old, men and women, in various stages and conditions of life.

3. To avoid monotony by introducing variety in music, speeches, etc.

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Canada is Flourishing

From Coast to Coast

Vernon, B.C.—Apple shipments from the Kelowna district up to November 16th amounted to 2,319,000 boxes, as compared with 1,910,000 for the similar period of last year. This is an increase of 21.6 per cent.

Vancouver, B.C.—The Okanagan Shuswap and Thompson Valley continue to hold first place for honey production in the province, according to the Department of Agriculture. Of the total production of 985,709 pounds in the province, 437,079 came from that locality. Other leading producers were: Lower Fraser Valley 191,070 pounds, Kootenays 111,355 pounds and Vancouver Island, Gulf Island and Howe Sound 103,080 pounds. British Columbia's output is valued at $216,855 and beeswax at $5,000.

Vancouver, B.C.—The Tolmie Government, recognizing that the need for settlers is one of the province's most pressing questions, has authorized a complete enquiry into settlement and immigration problems and has appointed W. H. Gaddes of Kelowna, to undertake the investigation, according to local press reports. The scope of the investigation will cover the future of the Sumas reclamation area, the South Okanagan Irrigation area and the land settlement areas established after the war at Merville and Camp Lister, and now abandoned by the original settlers. Mr. Gaddes has been asked to submit plans for colonization of these lands and to recommend action for making them productive.

Victoria, B.C.—A few miles from the British Columbia capital is the only lavender farm on the American continent conducted by a woman, Mrs. O. M. Jones. Several acres of lavender are grown and manufactured on the spot into perfume.

Victoria, B.C.—British Columbian timber production in all lines will be approximately 10 per cent. greater this year than in 1927, according to rough preliminary estimates released by the Provincial Forestry Service. While lumber prices are reported slightly higher than last year, paper prices are down somewhat, and on this account officials declined to forecast definitely the value of the annual timber crop. It should, however, be larger than the figure of $83,000,000 in 1927, and perhaps above the 1926 figure of $84,802,000, the highest on record to date.

Charles A. Bowman, Editor-in-Chief of the Ottawa Citizen; Sir John Aird, President, Canadian Bank of Commerce; Augustine Frigon, Director, Montreal Polytechnic School. Sir John Aird is chairman of the new Radio Commission.

Canada Appoints Commission

Radio Conditions to be Improved

The commission will review radio conditions in Canada from the non-technical end and, among other things, will enquire into the following problems. 1. The establishment of one or more groups of high-powered broadcasting stations operating as private enterprises with the receipt of government subsidy. 2. The establishment and operation of such a system of stations to be owned and financed by the Dominion government. 3. The establishment and operation of stations by provincial governments.

It is encouraging to note the Governments recognition of the radio industry. A few years ago, only a few far-seeing public men could visualize the possibilities which radio held out. To-day, we understand the Province of Ontario is shaping the plan announced last spring, to establish a powerful station to broadcast much information for the advancement of agricultural science, to afford a greater knowledge and appreciation of the natural resources belonging to the people of this province.

Radio Window Display

One of the surest means of sustaining the public's interest in the purchase of a radio, now—rather than eight months from now, is the continued display of the 1929 models in your windows. Suitable hand lettered cards will suggest "Reasons why" they should not miss radio enjoyment.

History of Broadcasting

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4. To have distinctive features so timed as to assure their coming on at regular periods every evening. In other words, as a railroad does by its time-table.

5. To be continuous. That is, operate every day of the year. KDKA has operated without a break in schedule since the opening of the station.

In our discussion the subject of the first program was a matter of very careful deliberation. We wanted to do something unusual—we wanted to make it spectacular; we wanted it to attract attention.

(*To be continued*)

KDKA Brings Cheer

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I sincerely hope that the remaineer of the Boys will do their best and thank you in some way, shape or form.

If by any chance you should see Alex. Reid (2BE) should like to have news shot through some evenings. I will log them and forward same to him showing results. Maybe you could let me know the dates and time he will transmit. Will listen in for KDKA Saturday nights as per schedule.

Gee, I am sorry I could not get to see you as I was rushed for time, whilst in Montreal.

Please thank Bob Foster for diagrams of the New Short W.R. Give him my kindest regards. We are in among the bergs once again, reminds me of 1925. Shall be at Godhaven, Greenland, early tomorrow morn., 26th inst.

Will write again shortly, I remain

Sincerely yours,

(Sgd) MAURICE TIMBURY

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Chamber's Banquet To KDKA

Testimonial In Honor Of The Tenth Anniversary Of The World's Pioneer Broadcasting Station Big Affair With Many Distinguished Guests

THE Pittsburgh Chamber of Commerce is gratified by the great success of its complimentary banquet at the William Penn Hotel last Monday evening, November 3, to KDKA, the world's pioneering broadcasting station, on the occasion of that famous station's attainment of its tenth anniversary. The eight hundred guests who attended all joined the Chamber in its congratulations to KDKA and the Westinghouse Electric and Manufacturing Company, by which KDKA was founded and is owned and operated.

Marveling at the tremendous growth of an industry which shed its swaddling clothes in a corner of the old Pittsburgh Post building on November 2, 1920, and predicting still more remarkable strides in the future, speakers paid tribute at the banquet to Westinghouse officials who pioneered in the establishment of KDKA.

Major General Charles McKinley Saltzman, chairman of the Federal Radio Commission; Merlin H. Aylesworth, president of the National Broadcasting Company; James Francis Burke and Amos 'n' Andy, radio entertainers were among celebrities on the banquet program.

Thomas A. Dunn, first vice president of the Chamber of Commerce, introduced the toastmaster, Mr. Aylesworth, in the absence of James Rae, president of the Chamber, who is ill.

The invocation was delivered by Dr. Edwin J. Van Etten, pastor of Calvary Episcopal church, who delivered the world's first radio sermon on January 2, 1921. H. P. Davis, vice-president of the Westinghouse Electric and Manufacturing Company, known to fans as the "father of broadcasting," Frank Conrad and J. C. McQuiston were introduced. All three were representives of the Westinghouse Electric & Manufacturing Company in establishing the first broadcasting station in the world.

Letter from President Hoover

President Hoover, unable through stress of official business to attend the celebration, addressed a letter to Mr. Davis, in which he declared that "the high level of service and the wholesome character of programs should be a source of pride to all engaged in it, and is a development of our National life of immeasurable importance." The letter was read by Mr. Aylesworth.

Mr. Aylesworth lauded the courage of the men who made KDKA the "pioneer broadcasting station" by announcing the returns of the Harding-Cox election. Their courage was more than justified, he said, by the fact that radio receiving sets today are carrying programs to 50,000,000 people.

In introducing General Saltzman, whose brilliant army record won him two silver star citations for "gallantry in action" in the Spanish-American war and the distinguished service medal for "exceptionally meritorious and conspicuous services" in the World war, Mr. Aylesworth reviewed Saltzman's service for his country and his record in National and international radio activities.

H. P. Davis, "The Father of Radio Broadcasting"

James Francis Burke of Pittsburgh, was introduced as the father of radio legislation while he was a representative in Congress, from 1905 to 1915. Mr. Burke paid tribute to "those who have given the world one of the most important contributions in the history of science."

"Amos 'n' Andy," or Freeman Gosden and Charles Correl, radio stars whose fame is nationwide, were popular guests. And like Abou Ben Adhem, their names "lead all the rest" on the autograph page of programs of swarms of admirers who crowded about them early in the evening.

They were introduced by Mr. Aylesworth and presented a sketch "just in fun." Departing from their customary humorous chatter, the comedians mentioned some of their personal experiences which gave an indication of the extent of radio popularity, and paid their respects to radio executives.

Honor Guests

Chauncey Parnell, tenor, and J. Oliver Riehl, now in charge of the Chicago division of the National Broadcasting chain, who took part in the initial broadcast from KDKA, entertained again with a musical number on last night's program. Other musical

(Continued on page 15)

Attends Boston and Philadelphia Meetings Same Day

Maurice R. Scharff

A good example to Pittsburgh businessmen, and a striking demonstration of how they can save time and money, was given two weeks ago by Maurice R. Scharff, president of the Main Aeronautics Corporation of Pittsburgh.

Mr. Scharff kept an engagement in Philadelphia from nine to eleven o'clock in the morning and then flew to Boston by the Ludington and Colonial Air Lines arriving in time to attend a meeting of the Corporation of the Massachusetts Institute of Technology at two-thirty in the afternoon of the same day.

J. W. Cree, Jr., Heads State Realty Men

J. W. Cree, Jr.

The portrait here shown is that of one of the members of the board of directors of the Pittsburgh Chamber of Commerce, J. W. Cree, Jr., who was honored by election to the presidency of the Pennsylvania Real Estate Association at the tenth annual convention of the body in Reading two weeks ago.

Mr. Cree has been prominent in Pittsburgh for the past 28 years as manager of the Denny estate, a director of the Commonwealth Trust Company, a member of the board of governers of the Pittsburgh Real Estate Board for ten years, and two times vice president of the Pittsburgh board, as well as a vice president of the state association.

Chamber's Banquet

(*Continued from page 7*)

entertainment was provided by the Westinghouse orchestra and ensemble. The addresses and part of the musical program were broadcast from KDKA.

In addition to the speakers, guests at the speakers' table included H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company; Frank Conrad, assistant chief engineer for the Westinghouse company; J. C. McQuiston, Westinghouse general advertising manager; A. W. Robertson, chairman of the board; Frank A. Merrick, president; E. M. Herr, vice chairman; Paul Gascoyne, representing the Republican national committee, Washington, D. C.; J. W. Marsh, vice chairman of the General Cable Corporation; Congressman Harry A. Estep; Roy Witmer, National Broadcasting Company; James L. Ray, vice president of the R. C. A. Victor Corporation; Charles W. Horn, general engineer of the National Broadcasting Company; J. W. Elwood, vice president, National Broadcasting Company; Frank E. Mullen, National Broadcasting Company, Chicago; T. P. Gaylord, vice president, Westinghouse Electric and Manufacturing Company; A. E. Braun, president Farmers Deposit National Bank; L. W. Chubb, manager, research engineering department, Westinghouse and H. W. Arlin, KDKA's pioneer announcer."

The arrangements for the banquet were under the direction of the Entertainment Committee of the Chamber of Commerce, composed of Louis J. Lind, Chairman, and Alexander Murdoch, James Francis Burke, Dan T. Felix, L. I. McQueen, J. C. McQuiston, B. H. Mustin, Frederick G. Rodgers, W. Denny Shaler and John M. Wellings.

In London, recently, a baby gave the alarm for fire and roused the occupants. A campaign is to be launched urging every householder to install one of these useful little gadgets.—London Opinion.

G4:21
Box 2
FF 19

Issues of Periodicals which Contain articles by H.P. Davis

Davis, H.P. 1868-1931. Papers, 1915-1944

over land and sea. It, too, is light. The whole world is a creation of light and light lies in the mysterious secret of God.

"Let there be light!" said God; and forthwith light
Ethereal, first of things, quintessence pure,
Sprung from the deep; and, from her native east,
To journey through the aery gloom began,
Spher'd in a radiant cloud."

The Meaning for Religion

What does this mean for religion? What does this revelation of the unity of the world, of the rending of the veil between thought and things, between sense and spirit, between things intellectual and things physical, between earth and heaven, time and Eternity mean?

It must mean that the world is more mysterious, more potential, more spiritual than we had thought. It must mean that what we call the supernatural is not outlawed in the world of nature. It must mean that Jesus of Nazareth, moving among men, having a miraculous power over men and nature, dying on a cross, rising from the dead, cannot be dismissed with a shrug of the shoulder. It must mean that moving behind all things visible and invisible is a Spirit who is the life of all things in heaven and earth.

Take for example the familiar story of the transfiguration of Jesus, as told in the Gospel. How close we are in this majestic, mysterious story to the magnificent revelation of the scientist. What is this transfiguration but a manifestation of light? It is a spectacle and miracle of light, transforming, transfiguring light which is said to be the subtle fabric out of which all that is comes. You see, then, that the door that opens out into the world of faith stands wide open. It is not closed. Only our limited senses hinder us from seeing and knowing beyond the range of things physical. Far above and below the octave which our ears hear there are voices and sounds which run off into inaudibility. Far above and below the light that breaks in color in the spectrum there are radiant hues beyond the discovery of the most sensitive human eye and far above the margin of our spiritual experiences there is a world of spirit where infinite life dwells in unfading light. This is not mysticism, it is reality.

"The Spring blew trumpets of color;
Her Green sang in my brain,
I heard a blind man groping
'Tap, tap' with his cane;

I pitied him in his blindness;
But can I boast 'I see'?
Perhaps there walks a spirit
Close by, who pities me,
A spirit who hears me tapping
The five-sensed cane of mind
Amid such unguessed glories,
That I am worse than blind."

Can We Use This High New Power?

The great question we face is, Are we great enough and good enough to enter this open door which has been set before us? Can we use to high advantage these new currents of light, this new channel of communication which the radio has opened up to us? What have we to offer that is worth while? We would not burden an airplane with brick and mortar. Neither would we load the radio with trivialities. It is not worth while to broadcast that which is not worth while to say or sing. What have we to offer that will justify a release to millions of men? It is for us to answer. The dramatist must answer and he is trying hard to give his answer. The singer must answer, the orchestra must answer, the statesman must answer, the politician and the orator must answer. If there is nothing worth while to transmit then it matters nothing whether we have the miracle of the radio or not.

The Church Must Answer

The Church, too, must answer. What has it to offer? Well, that which the Church has to offer is the most desired, the most needed, the most superior, the most gracious message of anything that is offered over the radio today and it would be a tragedy if that message were silenced. What is that message? Standing before the Egyptian sphinx a great preacher was asked by a friend, "If you had one question to ask the sphinx, what would that question be?" He replied, "I would ask the question, Is the universe friendly?" We are sure of the mystery of the universe. We are sure of its majesty. Are we sure of its friendliness? That is what we want to know and that is the word of the Gospel. Over land and sea, through earth and air, the message and music of the Gospel are carried to all of our land and to all lands and this is the word that goes forth, "God was in Christ, reconciling the world unto Himself."

This is the eternal, timeless, friendly message that goes out from the Church through the courtesy—in this case—of the Westinghouse station KDKA.

"The stars shine over the earth,
The stars shine over the sea
The stars look up to God
And the stars look down upon me.

The stars shall shine for a million years
For a million years and a day
But God and I shall live and love
When the stars have passed away."

Nine Years of Religious Broadcasting

An Address by Mr. H. P. Davis, Vice President, Westinghouse Electric and Manufacturing Company, at Unveiling of Radio Tablet, Shadyside Presbyterian Church, May 24, 1931.

Dr. Kerr, Members of Shadyside Presbyterian Church and Guest, Friends of KDKA listening in:

At rather infrequent intervals in the past two centuries it has happened that public agencies of real service in the development of our modern civilization have appeared. Because of the fact that such agencies broaden human happiness and accelerate the steady march of human progress they develop from small beginnings to huge instrumentalities of public service. One such agency, the last to have put in its appearance, more than any of its predecessors truly merits the term "public service," and in an inconceivably short time has built a firm foundation for a lasting and growing service. I refer to radio broadcasting.

Early Use of Broadcasting Religious Services

One of the strong elements of this foundation is the early and continued use of religious services in radio programs. Almost from the day of its beginning, things religious have been a part of KDKA's service to the world. The precepts which guided this station in its pioneering days, without a compass on an uncharted sea, have become the cardinal rules of broadcasting conduct all over the world. Therefore, it is most fitting that we gather here today to recognize the pioneer importance of the event which is commemorated in this beautiful and sig-

nificant tablet that has just been unveiled. In performing this act we are recognizing the importance of religion and the tenets of Christianity to radio broadcasting. We know that the lighter forms of radio entertainment may well be likened to the glitter of tinsel, but we recognize that the enduring foundation of radio's advance and lasting public service is its religious and educational development.

The Receptacle Back of the Tablet

In a receptacle back of this tablet, it is my understanding, there will be placed historical records gathered to establish the facts proclaimed on the face of this beautiful tablet, together with other significant memoirs collected during the nine years these Vesper Services have been broadcast.

To a future generation they will reveal the inspirations and earnest efforts of today. They will also reveal the comfort, solace and inspiration brought to lonely and pain-wracked lives. They tell of the comfort and cheer that have come from this church to the Arctic Circle; to Antarctic Polar Expeditions; to desert spaces; to the solitary life as well as to the crowded center; to the sick and to the well; to the young as well as to the old.

Honor to Dr. Kerr

Dr. Hugh Thomson Kerr, all honor to you; you may well be proud of your achievements and these results of your efforts, for I am certain that long after those of us assembled here have gone to our reward, these documents will remain to tell of an important chapter in broadcasting's pioneer history.

During a period in which it was frequently stated that religion was slipping and that the vital spark was missing to rekindle its activity, that spark was really to originate in a way entirely outside the conceptions of those who were giving so much thought to this vital question.

Designed by Mr. Frank Vittor.

A New Vehicle for Spiritual Development

I refer to the birth of radio broadcasting, which was to arrest the decay and become a new vehicle for the nation's spiritual development—yes, even the world's spiritual development. In fact, almost in an instant the greatest agency for the dissemination of the Word of God was available. There is only one qualification in such broadcasting, which is that these messages must be non-sectarian and non-denominational in appeal for the religious broadcast message should present the broad claims of religion to not only aid in building up the personal and social life of the individual, but also to portray the true worth of religion and the church to humanity. It was to be an agency wherein the religious message broadcast could interpret religion at its highest and best, so that as an educational factor it would bring the individual listener to realize his responsibility to the organized church and to society.

It did not take radio long to find a multitude of souls eager to receive the solace and the comfort of religion. One of the most famous of radio ministers has stated that thousands and thousands of responses to his service have demonstrated the deep and indeed the passionate allegiance of the American people to what has been finely phrased "things of the spirit," thus demonstrating the fact that religion is the most important business of a free people.

The start of Dr. Kerr's Vesper Service broadcast by KDKA was almost simultaneous with the beginning of world broadcasting from that station. In that year the Westinghouse Electric and Manufacturing Company started their now famous experiments with high frequencies, popularly known as short waves, for the purpose of determining what use could be made of this part of the broadcast spectrum.

The Discovery of Short Wave Transmission

Previous to these experiments short waves, although known to radio engineers, were not considered as having much value. However, these investigations showed that these previous engineering conclusions were very wrong, possibly because the engineers had failed to recognize the possibilities inherent in them for long distance transmission. We thought we saw sufficient promise in them, however, to take another pioneering step in radio transmission. We very shortly found encouragement and results proving that we had really taken another epochal step, as we learned that this short wave transmitter was reaching every country on the globe. Thus KDKA was again a pioneer with a medium destined to be used later both in long distance broadcasting and in long distance communication. I refer to this because it was by means of short waves that the Vesper Services of this church were enabled to go forth to the continents of the world, and to make possible the facts recorded on this tablet. Religious belief is an inherent part of mankind, and history records no peoples, however ancient, but who show some kind of organized religious belief. It thus becomes the oldest organized force in the world.

Undreamed of Results Yet Await Us

Radio itself is a mysterious force concerning which only a little is yet known. Many of its possibilities are still to be developed with perhaps undreamed of results awaiting the engineer or research investigator bold enough, curious enough, and sufficiently wise and courageous to penetrate the portals of mystery that surround it.

Is it not curious that religion, the oldest known community activity of mankind, which has persisted since the birth of man, should find in this very young agency the greatest force that has ever appeared for its use in spreading the Word of God to the entire world? These short waves have made it possible not only to speak through the transmitting station to local communities, but also to states and to countries throughout the world. That old axiom "necessity is the mother of invention" can be applied to this case in a very much broader sense, for when there was the very dire necessity to develop a broader religious thought this new element became available. There are probably a great many people who would say that it was the Almighty working through the mind of man. I hesitate to make any comment on this thought for it seems, as I have said before, that when the need was for something to assist spiritual growth, radio broadcasting came into existence and to further spread that growth over the entire world, the use of the short waves was developed. There may be some-

thing more than coincidence in these developments.

A Pioneering Event

Now, what is a pioneer? He is one who enters first to open and prepare the way for others to follow. There is pioneering effort of some kind going on all of the time. This is demonstrated in one line of human endeavor by the activities of the Patent Office at Washington. It does not, however, often occur that such effort creates a new industry and introduces elements of sufficient novelty and usefulness as to change human happiness, customs and contacts. The introduction of radio broadcasting into our human activities actually did this, almost overnight. The importance of this as an historical event is probably dimmed by our nearness to it. In later years, everything that has to do with these pioneer efforts will be of the greatest historical interest.

An officer of the Hudson's Bay Company expressed this thought in a most concise manner. He wrote: "It may seem a somewhat trivial matter to record these facts at the present time, but having regard to the value now attached to the Hudson's Bay Company records of centuries ago, we feel sure that such record will prove of greatest interest to posterity." This refers to the minute that was made in the records of the Hudson's Bay Company regarding the event which is recorded on this tablet. Too little public acknowledgement of these pioneering events has occurred. In view of this, we must agree that the record on this tablet is timely and as a pioneering event is thus worthy of being preserved.

Possibilities of Broadcasting

The extent to which radio broadcasting has transformed human life and enlarged its possibilities can only be measured in the distant future, and no one now can foresee the extent of its development. Today it is possible for fifty million human beings to hear a speaker. It will not be long before the population of the entire globe can be reached by one voice, and thus be as closely assembled, insofar as communication is concerned, as though they were in one room. Such are the opportunities that will be ready for the greatest teachers, preachers and statesmen. I have spoken of this at length to impress you with the great value of this tablet, recording, as it does, for future generations, the first time that a minister speaking in his pulpit sent a special message direct to an individual imprisoned in icy solitude, far from human habitation and without other means of contact. Thus was the first step taken to develop a service which has become of inestimable value to people so situated as to be out of contact with their fellow men. This honor belongs to Dr. Kerr and to this church.

A Forecast of the General Assembly

A PROPHECY AND PRAYER

By Dr. Hugh Thomson Kerr, Retiring Moderator

It is not too much to expect that the coming General Assembly will bring to the Church a great spiritual blessing.

The attention of the Church is being drawn already to the fact that a hundred years ago in Pittsburgh the Western Foreign Missionary Society was founded, out of which grew our great Board of Foreign Missions. It is necessary, however, if we are to understand this event, to go back to the religious atmosphere of a hundred years ago. The narrative of the state of religion presented to the Assembly in 1831 is most interesting. Two or three sentences, taken from that report, will give us the background and the religious values which laid hold upon the church then which brought forth in effective service the forward missionary enterprise. That report says:

"The past year has been such a year of revivals and rejoicings in the church as never before was known in this land. The presence and power of God have been so manifest that the most vile, though they refuse to repent, have not the hardihood to oppose or to rebel. In these great, great works of salvation some of all orders and ranks and ages and character have been included. The child of six or seven years and the aged sinner have been brought together at the feet of Jesus. The man of wealth and the poor man have been united in begging for mercy of Him who is no respecter of persons. It is believed that no previous revival ever took so large a proportion of wealth and learning and influence of society as this has done, and already the treasuries of many benevolent societies have felt their influence."

If the emphasis is rightly placed upon the centenary of the foreign missionary work of our church, there must be a stressing of the spiritual values which wrought so mightily in the church a hundred years ago. There are evidences of unusual spiritual interest in regard to the coming General Assembly. The arrangements for the Assembly have been carried forward in prayer. The Presbytery of Pittsburgh has had weekly prayer services, and all those who are on committees working in behalf of the Assembly have been called for a service of consecration and dedication. Throughout the church there is a watchful and expectant attitude and a longing for the coming of a new dynamic into the life of the church that can only be supplied by the Spirit of God.

The church is the conscience of the nation. It must not reflect but direct the moral and spiritual life of the people. It would be fatal if the Presbyterian General Assembly were merely to reiterate and repeat the phrases and the watchwords which are current in the ordinary political and social life of our age. The church is the watchman, and the question which is asked of it, "Watchman, what of the night?" must receive an answer. That answer cannot be in the terms of the ordinary low level of the morality which finds its expression in our present social order.

One thing more. There are on the horizon no issues to distract or divide the attention of the church from its supreme objective. If this Assembly refuses to permit itself to be drawn into debate concerning the things that lie on the fringe, we will not be disappointed in our expectation. These are hard and difficult days for Christian men out in the world. Never before were men looking more eagerly for some word of courage and faith to enable them to face the stern facts of a distracted and weary world. Men in business need a baptism of hope and they look to the Church of God for the word which will inspire and strengthen them and send them forth to carry on their work not only in the church but in the world. We need religion today more than we need economics. We need a revival of righteousness and of power to live above depression.

The Presbyterian Church is not divided on any vital issue; and no man can divide it.

This Assembly will think more about the things that unite than the things that divide; and it will have something to say about unity in church life; and will encourage a progressive policy concerning organized church union in our American Presbyterian family.

The Presbytery of Pittsburgh awaits the coming of the Commissioners from all parts of the world, in humble dependence upon the leadership of Him who is Himself the Head of the

Yellow 3

Pgh Sun
9/29/1920

Air Concert "Picked Up" By Radio Here

Victrola music, played into the air over a wireless telephone, was "picked up" by listeners on the wireless receiving station which was recently installed here for patrons interested in wireless experiments. The concert was heard Thursday night about 10 o'clock, and continued 20 minutes. Two orchestra numbers, a soprano solo—which rang particularly high and clear through the air—and a juvenile "talking piece" constituted the program.

The music was from a Victrola pulled up close to the transmitter of a wireless telephone in the home of Frank Conrad, Penn and Peebles avenues, Wilkinsburg. Mr. Conrad is a wireless enthusiast and "puts on" the wireless concerts periodically for the entertainment of the many people in this district who have wireless sets.

Amateur Wireless Sets, made by the maker of the Set which is in operation in our store, are on sale here $10.00 up.

—*West Basement.*

THE ELECTRIC JOURNAL

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Radio—Its Future

Looking into the future of radio development one sees possibilities of great expansion in an almost limitless field. The uses to which radio can be put are greatly diversified, and it is certain to create as epochal changes in our accepted everyday affairs as did the introduction of the telegraph and telephone, and the application of electricity to the street railway and to lighting.

Already the commercial transmission of messages by radio telegraphy is well-established. The speed of this transmission and the reliability of the radio systems as compared with wire and cable systems are favorable to the former. For long distance work the radio systems have greater capacity, can handle more traffic and the operation is performed at lesser tolls.

Following the developments of radio telegraphy, great advances are now being made in radiophone development. It is not to be assumed that the radiophone will displace the present wire telephone, rather that it will broaden the field of communication by the development of its own special advantages, which are more or less distinct from those of the wire telephone, as it possesses the feature of widest publicity, as compared with the secret or practically private character of the wire telephone. The two together will make many new applications possible, and it has now become practicable to converse on the sea, in the air or on moving trains, to one's own office or home, exactly as with land telephonic communication.

There is no doubt that in the very near future the radiophone will be largely employed over long distances in sparsely settled districts where other communication facilities are not now available. When it is considered that wherever wire systems reach there must be pole lines which are subject to damage by storms and other agencies, it can be seen how tremendously radio overcomes conditions of cost of installation, maintenance and reliability of service, which cannot be met advantageously by the wire systems.

The adaptability of the radiophone to broadcasting reports, news, entertainments, concerts, lectures, etc., creates a field particularly its own, and it is reasonably certain that the future will see many changes in the present accepted methods of conducting such functions and entertainments. It is quite possible that especially constructed transmitting rooms will be provided for such purposes, so that voices and music will be broadcasted through unbounded areas and listened to by invisible and widely-distributed audiences of vast numbers. The same opportunities would thus exist for the country dweller as for the city resident, and inmates of hospitals and sanitariums, and sick people and invalids in the home would have opportunities for pleasures and diversions now denied them. A transmitting system of this character would have the further great advantage of doing away with the necessity of appearing in person in public halls and auditoriums, the capacities of which at best are quite limited.

The importance of reaching such tremendous numbers of people, with practically no effort, offers great possibilities for advertising and the distribution of news and important facts, and in reality introduces a "universal speaking service." It is not unreasonable to predict that the time will come when almost every home will include in its furnishing some sort of loud-speaking radio receiving instrument, which can be put into operation at will, permitting the householder to be in more or less constant touch with the outside world through these broadcasting agencies.

The application of radio to industry presents a vast undeveloped field of enormous possibilities. There are great possibilities in all methods of signaling, particularly in railroad operation for the dispatching of trains and for use as a means of communication over areas served by power transmission companies. During the World War it was conclusively demonstrated that radio is an indispensable agency in the directing of air planes and vessels, and in directing and controlling the movement of armies on the battlefields.

To what extent power can be transmitted by radio is as yet problematical, but it is possible even now to perform this important function in a minor way, so that electric relays can be operated at a distance, thus permitting the putting into operation of independent sources of power to direct and control various mechanical devices. As time progresses and knowledge increases, this field will undoubtedly be greatly advanced and developed.

The field of radio application is practically unlimited in the important affairs of the world, and its development will mark one of the great steps in the progress and evolution of mankind. H. P. DAVIS

Yale Alumni Weekly
March 10, 1922

Radio Broadcasting

BY H. P. DAVIS
Vice President, Westinghouse Electric and Manufacturing Co.

To-day a new public service has arisen and is exerting a potent influence in every-day affairs, which is remarkable in two ways: first, for what it already has accomplished, and second, for the seemingly unlimited possibilities of the future. This is made possible by the radio telephone or radiophone. The ordinary telephone is essentially a means of person-to-person conversation; it is individual. The radiophone is fundamentally different; it does not readily lend itself to private conversation; all may listen who have the suitable "ear." Thus radio enables one to communicate with a hundred, or a thousand, or a million. A new field for communication unfolds; a new kind of public service is possible. What was at first an amateur amusement or a scientific novelty has quickly become widespread, commercial and cultural. Broadcasting is not a visionary dream; it is an accomplished fact.

As a means of popular communication, the radiophone is a most wonderful and fascinating facility, and is destined to be one of the greatest utilities that has ever been made available to mankind. It will serve further to bring people into closer relation, just as have good roads, the motor car, the telephone, and other modern utilities and conveniences.

In its simplest terms "radio broadcasting" consists of sending out by radiophone, from a powerful transmitting station, speeches, news, music, church services, results of sporting events—in short, anything with a universal appeal. This information can be received by anyone having radiophone receiving apparatus anywhere within a suitable radius of the transmitting station. Anyone is permitted to operate a receiving set without restriction. The apparatus needed for receiving ranges from the simplest crystal detector set for short distance reception to the highly sensitive vacuum tube sets, capable of great amplification, for long distance reception.

It is interesting to trace the progress of radio broadcasting from its inception. In November, 1920, the Westinghouse Electric & Manufacturing Company, which is taking an active part in the development of radio communication, transmitted or broadcasted the election returns from its experimental station KDKA at East Pittsburgh, Pa. The returns were received by many radio enthusiasts and the demand for further broadcasting was immediate and pronounced. A regular service from 8:30 to 9:30 was at once instituted, and has since been continued without interruption. This was the first regular public service of this kind inaugurated. Programs consisting of music, news announcements, etc., are made up in advance and are published in practically all the newspapers within a radius of 200 miles from the station. Frequently the service is received by radio listeners as far distant as Texas, Kansas, the Dakotas, Canada, Florida, and on board ships many hundred miles on the Atlantic Ocean. Now and then reports come in from such distances as points in the northern part of South America, Cuba, and the State of Washington.

After nine months of operation, a second broadcasting station was opened under the same auspices in Newark, N. J., followed shortly by one in Springfield, Mass., and recently by one in Chicago, Ill. The last named has made the broadcasting of grand opera from the Chicago Grand Opera Company a special feature. This extension of service has been a direct response to the call for such service by the public at large. The number of those listening is difficult to estimate, but it certainly reaches many thousands—probably at the present time at least 500,000 people, which number is being greatly added to each day. That this service has a real appeal is evidenced by the thousands of letters received by the Westinghouse Company and by others who have participated in the programs, and by the further fact that at least three out of four persons are interested in the subject.

It is natural that it should be so, for think what it means to the great mass of people to enable them to listen to important speakers; to hear artists who appear at concerts, and lecturers who appear in our various lecture courses; to be connected to all manner of public functions such as banquets, meetings, sports! Then there are the shut-ins who are physically unable to attend any of these things even though they may have the means to do so—think what radio means to them! And when we visualize that a large percentage of the population of this country live in small towns or in isolated districts away from the cities, who have very little in the way of diversion, especially in the winter, we can realize in a measure what radio will mean to them. And if these possibilities are doubtful—which I do not admit—there is one simple thing which has been demonstrated, and that is the ability to transmit church services in a thoroughly effective manner, which in itself is sufficient to make radio exceedingly popular, beneficial, and permanent. Conceive of people in the isolated districts in the great northwest sitting down in the evenings before the fire, in their own homes, and hearing grand opera sung by the foremost stars of the world! Impossible as this would have seemed a little while ago, to-day it is a common occurrence. Surely the advance in civilization can be measured almost month by month.

What is it going to mean to the public as a whole to hear the words of the President of the United States, or other high officials or distinguished men, when they have important announcements or speeches to make? To "listen in" on the deliberations in the House of Representatives, or the Senate, and in this way keep in closer contact with the problems of national interest? And it is not a wild dream to believe that this same facility will be extended so that we can be kept in touch with important events transpiring in other countries. Add to this the information that can be furnished to the public in all lines of commercial activity, and national and international news, and it is not hard to visualize that we have in our hands the instrument that will prove to be the greatest and most direct communicational and educational means that has ever appeared. The newspaper has been developed to a wonderful stage of perfection and wields a tremendous influence in our lives to-day—yet that influence is more or less local. The influence that is possible in radio is much broader; it is nation-wide—yes, even world-wide.

And where will it end? What are the limitations? Who dares predict? Scientists and inventors are working on relays which will permit one station to pass its message on to another, and we may easily expect to hear in an outlying farm in Maine some great artist singing into a radiophone many thousand miles away. A receiving set in every home, in every hotel room, in every hospital room, in every school room—why not? It is not so much a question of possibility—it is rather a question of "how soon." Every student who hopes to keep abreast of modern science, art, and invention must take cognizance of this new influence in human life—radio broadcasting.

The Permanency of Broadcasting

How A Scientific Novelty Developed In Eighteen Months to a Necessary and Popular Service—Present Limitations and the Line of Future Extension

By H. P. Davis

IT is always unsafe to assume the role of a prophet, but the writer presumed to take such a chance more than a year ago when in a published article he made the following statements:

"The adaptability of the radiophone to broadcasting reports, news, entertainments, concerts, lectures, etc., creates a field particularly its own, and it is reasonably certain that the future will see many changes in the present accepted methods of conducting such functions and entertainments. It is quite possible that especially constructed transmitting rooms will be provided for such purposes, so that voices and music will be broadcasted through unbounded areas and listened to by invisible and widely distributed audiences of vast numbers. The same opportunities would thus exist for the country dweller as for the city resident, and inmates of hospitals and sanitariums, and sick people and invalids in the home would have opportunities for pleasures and diversions now denied them. A transmitting system of this character would have the further great advantage of doing away with the necessity of appearing in person in public halls and auditoriums, the capacities of which at best are quite limited.

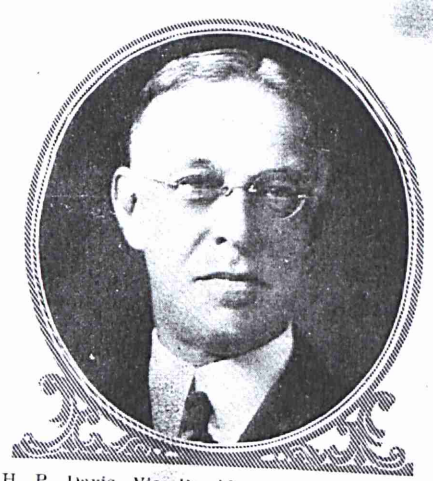
"The importance of reaching such tremendous numbers of people, with practically no effort, offers great possibilities for advertising and the distribution of news and important facts, and in reality introduces a 'universal speaking service.' It is not unreasonable to predict that the time will come when almost every home will include in its furnishing some sort of loud-speaking radio receiving instrument, which can be put into operation at will, permitting the householder to be in more or less constant touch with the outside world through these broadcasting agencies.

"The field of radio application is practically unlimited in the important affairs of the world, and this development will mark one of the great steps in the progress and evolution of mankind."

What is the situation today? In a period of wide-spread business depression, and thus a most inauspicious one for a new venture, radio is a topic of as universal interest as the weather; and the spell of radio broadcasting especially is becoming world-wide.

It is probably a fact that no facility or service has ever received such instant response from the public or has grown so fast in popularity, and at a time when the public buying power was generally believed to be nil, a market has been developed which is limited only by the ability of manufacturers to supply apparatus.

Civilization progresses in direct ratio to the advance in communication and transportation facilities, and the public



H. P. Davis, Vice-President of the Westinghouse Electric and Manufacturing Company

is quick to recognize and seize upon, and make use of, any new developments in either of these services. In a sense, radio broadcasting as a service has opened a new field for public communication, and what has been more or less of a scientific novelty, or possibly a visionary dream, has become almost overnight an accomplished fact and a wide-spread and necessary popular service.

It is fascinating in its mystery, and this is undoubtedly one of the greatest attractions in its first appeal to the imagination. But it is destined to be something more than a fascinating novelty, for as the possibilities of radio unfold we see before us a wonderful and permanent public service comparable with other modern facilities and conveniences in its ability to make life easier and better. Radio annihilates distance, reducing it to nothing, since the element of time scarcely enters into the speed of the transmission and can be entirely disregarded when it is possible to encircle the globe in a small fraction of a second with a radio wave.

We all realize that the interest of the public is fickle and that the mystery of this wonderful agency will wear off as it ceases to be a novelty, but even admitting that, the element of permanency is present in radio broadcasting. This is evidenced by the thousands of letters that have been received from the radio audiences, of which the following are samples:

"I'm an old lady, almost blind, 75 years old. My youngest grandson, an 18-year-old senior in high school, installed one of your radio sets for me last Monday, March 20, and I have enjoyed three fine concerts and two noon-hour services at Trinity Church. You are doing much good and giving great pleasure to the many, many 'shut-ins' like myself."

"We are located up on the lonesome mountains of Southeastern Kentucky. We listened in on your program last evening, and we certainly appreciate this very excellent music. We are about 200 miles from any large city, so you will understand why this is such a great treat to us and our miners."

"We enjoyed every bit of Tuesday night's program, but especially the talk given by the 'Bird Man.' We are country people and you know we live very near to nature, so his talk of the birds was very interesting to us. We are thankful to have lived to see this possible and we are surely indebted to you people who make it so. Being elderly people and during the winter's bad weather not often able to get out, it is a very great thing for us to be able to enjoy such things by radio."

Half our population resides in the country, and conditions similar to those recited in these letters will prevail. But consider also what it means to the sick, the infirm and the aged, even though they may be residents of the cities.

The broadcasting of church services alone, which was initiated by KDKA, the Westinghouse Electric and Manufacturing Company's broadcasting station at East Pittsburgh, Pennsylvania, would in itself be sufficient to make radio broadcasting permanent and invaluable. This service met with instant response, for it was at once unique and compelling it its appeal to people of all ages, classes and denominations, and is proving to be one of the greatest publicity and beneficent features ever presented; it is doing more to enlarge the church's sphere of

influence than any medium heretofore utilized.

As radio broadcasting is developed today it has one feature not possessed by any other service in existence, and except for the comparatively small cost of the initial installation, it is without favor and without price. Everyone can occupy a "free reserved seat" at any and every radio broadcasting performance. This is an important fact not generally recognized, for while one large electrical manufacturing company initiated the service and several companies are now maintaining broadcasting stations, the only financial support they receive for this costly service is the possible profit from the sale of receiving apparatus of their manufacture; but there are hundreds of other manufacturers and dealers who are manufacturing and selling receiving apparatus also, who do not support this service in any way whatever and who, because of this service, reap large benefits without exertion or expense on their part.

It is doubtful if there is any way in which this service can be made a direct revenue producer for such companies or institutions as foster it. Recognizing this fact, there must then be developed sufficient indirect value to those maintaining radio broadcasting stations to make it profitable for them to operate and develop this service.

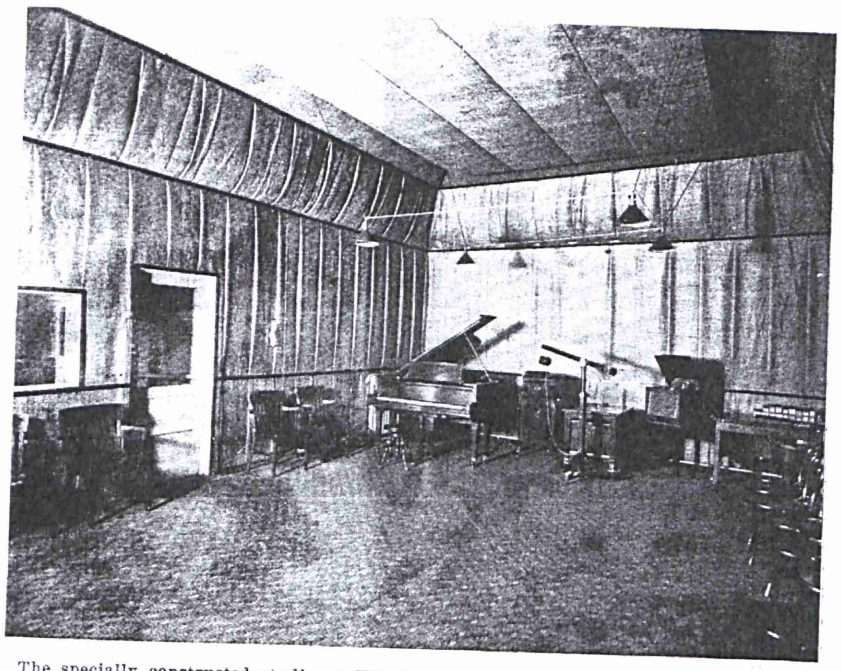
To the uninitiated it probably seems a simple matter to install a radio transmitting outfit and to broadcast music and speech and thus call the installation a broadcasting station. KDKA has now been in operation since the early part of November, 1920, and as the pioneer in radio broadcasting service, has made history in the development of the radio broadcasting art. It will be difficult for anyone now sitting at a receiving instrument to realize the amount of development work and expense that has been attached to bringing that station to its present effectiveness, but I am quite sure that if it were possible to compare what was considered good broadcasting a year and a half ago, and what is being transmitted today, it would at once be evident that a wonderful improvement has been brought about.

There are still considerable limitations in the ability of the available broadcasting apparatus to transmit talk and music tones true to life, and ultimate perfection of trueness is only attained when the listener receives what is broadcasted in the natural reflection and without distortion. Much thought is being given and work done to reach this perfection, and it is the writer's belief that very material steps of advance in this will be forthcoming shortly.

Our apparatus and means for radio broadcasting are today undeveloped, and if greater perfection is to be attained, confusion, with resultant public disgust, must be prevented; so protection of some kind is due those who foster and develop this service.

Recognizing that inefficient and interfering service will not be tolerated, the Government has already taken preliminary steps to formulate regulations with a view to materially improving this situation, in the recent conference held in Washington under the auspices of the Department of Commerce. As the conditions of service and the requirements of the public become better appreciated, means will be found to attain this end.

There are comparatively few available wave lengths in the ether, and to encourage this very necessary development these ether wave bands must be allocated and administered with much discrimination and care. Only companies or institutions with competent research and operating staffs, and financial means to back them, can possibly support this service in a proper manner and accomplish this most desirable perfecting of radio broadcasting. In other words, radio broadcast-



The specially constructed studio at KDKA station which realizes the prophecy of a year ago that such rooms would be provided for broadcasting stations

The transmitting microphone at WJZ into which great artists sing represents months of laboratory research and operating development

When W. J. Bryan speaks nowadays over the radio a quarter-million people hear the great Commoner

ing is an infant industry and it must have protection, and if this is properly and conservatively done we shall hold the public support and shall look back in a very short time in amazement at what has been accomplished.

It is unfortunate, however, that this imperfection of the sending apparatus is not as fully realized as it should be, with the result that many new broadcasting stations are being planned which must necessarily give only mediocre results. Not only is the ether going to be crowded, but crowded with discordant and disagreeable performances.

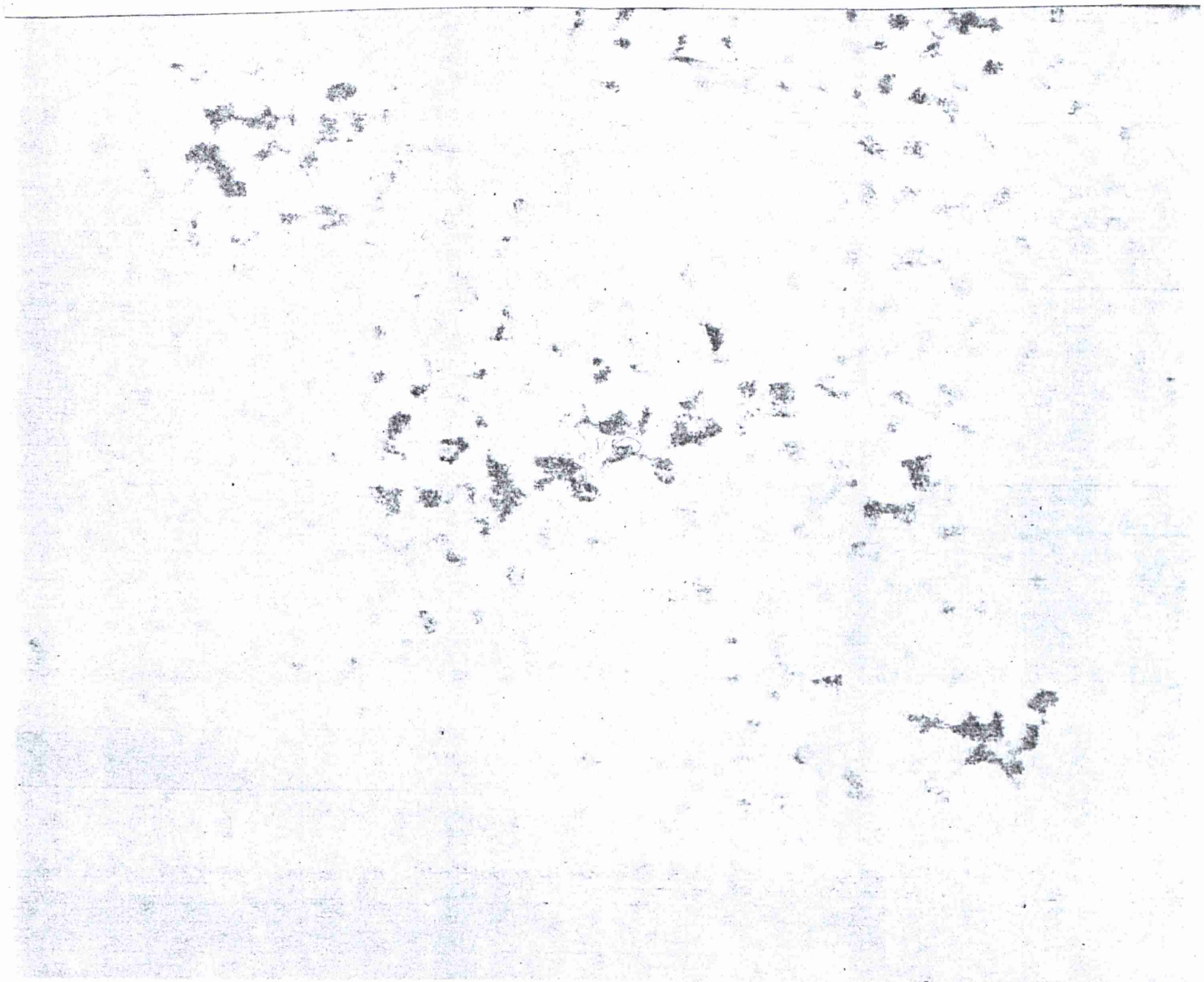
I feel that this period is going to be the test of the public's approbation. The growth of the public approval has been too rapid to be healthy, as it outstrips the growth of the development of the art, and while the fascination of broadcasting is the impelling force now, the period of development of not only the apparatus, but of the service itself is going to require patience and forbearance on the part of the public.

The same situation confronts this service as has been encountered in all other innovations or great steps of progress, and that is the attitude of those in allied established activities to look upon the newcomer as a rival which is to be regarded with suspicion and gauged in a competitive sense.

It is easy to see from what has been said herein that there is little or no revenue-producing opportunity in this service, and that the value attached to it is almost wholly one of advertising. Until this is realized and appreciated by those who must furnish the talent for the program, however, more or less difficulty will be experienced in perfecting and broadening the program service, and the attitude now being met on the part of a few lecturers, artists, theatrical and concert managers who refuse their assistance for fear of adversely affecting their box-office receipts and of reducing their earning capacity, must be converted to an appreciation of its advertising value — not as a destructive, but as a constructive agent: for if advertising in any way has been a benefit in h ing the growth of such undertaki the far greater advertising possibili in radio broadcasting must undoub ly bring greater returns for amount of energy expended than other agent yet available.

Undoubtedly, however, if this s ice is to fulfill its mission, ways be devised to overcome this difficu for in this case as in other case unusual developments, it will eve ally be found that, instead of bei competitor, radio broadcasting comes a source of development extension to the other arts. A ser which offers such possibilities mu the future wield a tremendous i ence, and overcome obstacles w now beset its path.

In broadcasting, radio has foun greatest usefulness and its most portant field of application, and destined to become a basic public s ice. The road is a rough one, h ever, as many of us who have intimately connected with its dev ment are realizing.



Portland Express Advertiser
Portland, Maine.
Apr 29, 1922

THE DEVELOPMENT OF RADIO-PHONE BROADCASTNG

(by L. R. Krumm)

(Part 2.)

H. P. Davis, Vice President of the Westinghouse Electric & Manufacturing Company, who was responsible for his company entertaining the radio field, had been watching not only the technical development of the public toward broadcasting, realized equipment but also the attitude of the the necessity of providing this service in systematic and properly organized manner as a part of his company's business operations, and, therefore, in the fall of 1922 began to construction of a broadcasting station at the East Pittsburgh works. Through Mr. Davis, therefore, more than anyone else in the country is due the credit for starting broadcasting on a nation-wide scale. He was the first man to sense the tremendous importance of the radio-phone.

Experiments were carried on for some by broadcasting the election night in November, 1920, when it was intended to inaugurate this service by boardcasting the election returns. A special license was obtained from the government radio inspector in Detroit, Michigan, and the call letters 8ZZ were assigned to the station in the beginning. The election results were startlingly satisfactory and the letters of appreciation received by the company dispersed any doubt as to the advisability of continuing broadcasting. Plans for the improvement and enlargement of the station were immediately inaugurated and regularly nightly programs were announced with specially selected artists as entertainers. A wave length of 360 meters was originally assigned to this station.

It was immediately evident that suitable programs must be provided for Sundays, as the ordinary entertainment did not seem appropriate. This naturally resulted in the desire to broadcast church in services, but this required additional technical development, as it was desired to transmit the complete service from the chimes to the postlude. It was, therefore, necessary to devise equipment which could be installed in the church, pick up the choir and congregational singing, the sermon and oral parts of the service and amplify them sufficiently so that they could be transmitted over the telephone line without distortion. Remember, this required transmission over thirteen miles of telephone line and cable. The accoustics of most churches leave much to be desired and this line transmitting was no simple problem. However, the enthusiasm shown by the radio andience after the first broadcasting of church services convinced that Westinghouse Company officials that they had made no mistake in attempting this feature and they have continued it ever since in all their stations and devoted a large part of their development effort to improving this part of their broadcasting services.

Much was printed during the war regarding the radio telephone developments for our fighting forces. While many interesting developments resulted and some fundamental principles founded there was very little practical application of radio telephony during the war and practically none by the fighting forces. In the development work Mr. Conrad had been an active participant and began his experience as a basis and used the personnel and manufacturing facilities of the Westinghouse Electric & Manufacturing Company.

When the company took up broadcasting activitly they immediately provided the necessary funds to develop i tto the utmost. It is not exaggeration to state that their station at East Pittsburgh known as KDKA, the matured successor of 8ZZ, has never been more than one week old in the sense that better and improved forms of equipment are continuously being provided. KDKA may, therefore, be called the father of broadcasting activities in this country today. It is true that radio telephone broadcasting had been attempted spasmodically even previous to the war. Various experimenters had sent out music from their stations in the course of their efforts to develop radio of telephony. These experiments had been with varying result sas to quality and were never maintained with any regularity or dependability, so that the war found this country without any commercial radio telephony. Wartime developments indicated the possibilities which the coming of peace made realities. During the war all commercial radio activities were suspended by government decree. The development of KDKA since that time has just been followed.

After KDKA had been operated for nearly a year and its practicability demonstrated, the Westinghouse Company proceeded to establish additional stations at their branch factories at Newark, N. J. and East Springfield, Mass. These were opened in the fall of 1921.

Sound Waves and the Voice

Sound waves are waves in air. The air is alternately compressed and rarefied; the compression correspondent to a crest of the wave,, the rarefaction to the trough of the wave. A simple sound is made up of only one of these waves. More complex sounds are composed of a number of these waves. The voice, for instance, is a complex sound having, for a man, one wave whose frequency is about 250 per second, another of 500 per second, another of 750 per second, and so on. The wave of the lowest frequency is called the fundamental; the other waves are called harmonics or over-tones. It is the number of harmonics present and their relative amplitude (strength) which make it possible to distinguish one voice from another.

Captain Leon H. Richmond, U. S. A., in Radio Broadcast for June.

MEMORIAL DAY PLANS

Many old soldiers who don't feel strong enough to try the Memorial Day parades and the public speaking, will hear the orators. Instead of sitting out under a hot sun for hours, the veterans with radio sets will sit at their ease in a shady place ,and with head 'phones on their ears pick out of the ether, the patriotic speeches.

The sight of this veteran cannot help but point out the great progress made since he was a boy, fighting for his country. In the span of years that have followed 1861, there have been hundreds of inventions that if mentioned in the days of the Civil War would have not been believed possible. If in the days of Lincoln, someone should have said that his famous "Four score and seven" address would have been broadcast by radiophone and that people in all parts of the country could hear it, Lincoln would very probably have thought the speaker was a fit subject for an asylum. Yet a few years later, it's only a few years back to 1861, we have this miracle come to pass.

KDKA at East Pittsburgh, Pa., has prepared an attractive Memorial Day program. The wavelength is 360 meters. Listen in. KDKA's the daddy of all the radio broadcasting stations.

GREAT MEN OF RADIO

IX.—HARRY P. DAVIS

The father of the present day development of wireless, of the concerts on regular schedules, advance programmes, the broadcasting of information of a thousand varieties, the marshalling of world-famed singers and artists behind the radio transmitters of great stations, and the consequent entertainment of millions of persons throughout the nation — undoubtedly was Harry Phillip Davis, vice-president of the Westinghouse company.

In September, 1920, radio was mainly the subject of scientific research and experiment. The devices and instruments necessary for transmitting and receiving wireless messages were not obtainable in the general market. There was practically no popular demand for them, and they were hard to obtain. Prior to the war interest in radio had been growing slowly, but the exigencies of the great struggle stifled it. But in September, 1920, Mr. Davis saw in a newspaper advertisement that Frank Conrad "would send out phonograph records this evening" for amateurs. Mr. Davis envisioned then the future of radio.

Mr. Davis pondered over the matter for several days. He saw that the true field of wireless for a long time to come would not be private communication, but broad-

cast communication, and the tainment of hundreds, inde lions of persons all over th try. He saw that a station out entertainments, concer ords of current events on schedules, was the key to ture. He believed that on entertainment was broadca sons would demand "ears which to hear it. He s Frank Conrad, who had charge of wireless experim the government in Pittsbu ing the war. He succeeded ing the Conrad station, November, 1920, put into o under direction of Mr. Con KDKA station at East P as a broadcaster of progra popular entertainment.

Mr. Davis was born at worth, N. H. He was g from the Worcester Pol Institute with the degree in electrical engineering and after a trip to Europ few months spent with the son-Houston Company ent detail engineering depart the Westinghouse Company In 1896 he was placed in c this department; in 1908 made manager of the eng department.

Boston Evg. Press
June 1922

Who Saw the Radiophone Broadcasting Vision?

Harry Phillips Davis, Vice-President of the Westinghouse Electric & Manufacturing Company, Was the First Man to Foresee the Popular Appeal of Radio

HIS IDEA SUGGESTED BY A NEWSPAPER AD.

HARRY PHILLIPS DAVIS

"Frank, I'm going to close your station."

Paradoxial as the statement may seem, this was the actual start of radio broadcasting as we now know it. The concerts on regular schedules, advance programs, entertainment in the air, all came from closing "Frank's station," and opening KDKA, the first radiophone station in the world.

For "Frank" was Frank Conrad, assistant chief engineer of the Westinghouse Company, and the man who made the statement was Harry Phillips Davis, vice-president of the Westinghouse Company.

Mr. Davis had come into his office that morning in September 1920, with an idea. The idea had come to him while reading the advertisements in his evening paper. In a corner of a full page ad, he came across the words "Mr. Conrad will send out phonograph records this evening." This advertisement was in the interest of the store's amateur radio department and was explaining to local radio amateurs that Mr. Frank Conrad, who had operated his station intermittently since the war, would send out by radio, phonograph records on a certain evening. The Conrad station was very well known to amateurs all over the country, for it was one of the few amateurs stations licensed to operate during the war. This special operating was in the interests of government research work which the Westinghouse Company was doing and also to test some apparatus.

Mr. Davis could not forget his idea. He was struck with the fact that the radiophone fundamentally did not lend itself only to private communication but that it had a universal field of usefulness and that through it, one could communicate with hundreds, thousands or millions; all could listen who had the suitable "ear," for if a certain class of people were interested enough to listen to music from a few records there was a possibility of increasing this small audience of radio listeners to an enormous number by sending out entertainments, current events, etc., in a regular and interesting manner. Why confine one's audience to a small portion of the country? Why not build a big station and let everyone, who want to, hear? Why not make radio broadcasting a public service?

Mr. Davis was so struck with his idea of a public broadcasting service that the first thing he said to his secretary on entering his office the next morning was "Ask Frank to come in."

"Frank," as has been previously explained, was Mr. Conrad, who, having been taken so abruptly with his chief's statement, could only listen to what followed.

"Frank, my idea is that you stop sending from your station and we will start a regular service from our experimental station here at East Pittsburgh. We can arrange for a suitable wave length, and I believe that if we do this it will be the beginning of a radio broadcasting public service which seems to me to have wonderful possibilities."

The conference with Mr. Conrad lasted a short time and Mr. Davis called other conferences before actual work on the broadcasting started. It was not until November 11, 1920, that KDKA was formally opened with the broadcasting of election returns.

The remainder of the history of KDKA is now common property. Everyone, almost, now knows that there are over 200 broadcasting stations in the United States and that the radio audience numbers into the millions each night.

Not everyone knows, however, that it was a single line in a newspaper which suggested to the vice president of one of the largest electrical manufacturing companies in the world, the big thing of turning a scientific novelty into a new kind of public service by unfolding a new field of communication.

Mr. Davis was one of the best equipped men in the electrical industry to take up the difficult problems of broadcasting. He has been a leader in the electrical industry since his college days and has been issued nearly 100 patents covering electrical apparatus. He is an engineering genius and is known, not only as a designing engineer of high rank, but also as a man who gets things done. His ability to accomplish results has already been proved in the history of his company's broadcasting achievements. His ability was also admirably illustrated during the war. He was at that time in charge of production at the East Pittsburgh works and the duty of fulfilling the government contracts for munitions was his. Probably no more colossal manufacturing task was ever given anyone. The quantities involved were enormous; the time limits short; the specifications more rigid, new and undreamed of problems arose at every step; the government plans changed with bewildering frequency; material, competent help and transportation facilities became almost unobtainable; and innumerable other difficulties were encountered. Yet, in spite of everything, the work was done and it was done properly and on time. Not a single promise made to the government was broken.

This is all by way of illustrating the character of the man who first saw that radio broadcasting was something that held greater possibilities than just being the plaything of the amateur.

Mr. Davis was born at Somersworth, New Hampshire. He graduated from the Worcester Polytechnic Institute with the degree of B. S. in Electrical Engineering in 1890, and after a trip [illegible] with the Thompson-Houston Company, entered the Detail Engineering Department of the Westinghouse Company in 1891. In 1896 was placed in charge of this department; in 1908 he was made manager. This position he held until 1911 when he was elected vice president.

THE ELECTRIC JOURNAL

VOL. XIX JUNE, 1922 NO. 6

The Field of Radio Broadcasting

Today a new public service has arisen and is exerting a potent influence in our every-day affairs, which is remarkable in two ways;—first, for what it has already accomplished, and second, for the seemingly unlimited possibilities of the future. This is made possible by the radio telephone or radiophone. It is probably a fact that no facility or service has ever received such instant response from the public or has grown so fast in popularity as radio broadcasting. In its simplest terms "radio broadcasting" consists of sending out by radiophone, from a powerful transmitting station, speeches, news, music, church services, results of sporting events—in short, anything with a universal appeal. This information can be received by anyone having a receiving set anywhere within a suitable radius of the transmitting station, as anyone is permitted to operate a receiving set. The apparatus needed for receiving ranges from the simplest crystal detector set for short distance reception to the highly sensitive vacuum tube sets, capable of great amplification, for long distance reception.

The mysterious fascination of broadcasting is undoubtedly one of the greatest attractions in its first appeal to the imagination. It is, however, destined to become something more than a fascinating novelty for, as the possibilities of radio unfold we see before us a wonderful and permanent public service comparable with other modern facilities and conveniences in its ability to make life better and easier. Radio annihilates distance, reducing it to nothing. The element of time scarcely enters into the speed of the transmission and can be entirely disregarded in practice since it is possible for a radio wave to encircle the globe in a small fraction of a second.

It is interesting to trace the progress of radio broadcasting from its inception. In November, 1920, the Westinghouse Electric & Mfg. Company, which is taking an active part in the development of radio communication, broadcasted the election returns from KDKA, its experimental station at East Pittsburgh, Pa. The returns were received by many amateur radio enthusiasts and the demand for further broadcasting was immediate and pronounced. A regular service from 8:30 to 9:30 P.M. was at once instituted, and has since been continued without interruption. This was the first regular public service of this kind inaugurated. Programs consisting of music, news, announcements, etc., are made up in advance and are published in practically all the newspapers within a radius of 200 miles of the station. Frequently the service is received by radio listeners as far distant as Texas, Kansas, the Dakotas, Canada, Florida and on board ships many hundred miles out on the Atlantic Ocean. Now and then reports come in from such distances as points in the northern part of South America, Cuba, and the State of Washington, and quite recently, even with the static which is prevalent at this season of the year, strains of a concert from KDKA were heard in Iquique, Chile, which is about 1400 miles below the equator and 4200 miles from East Pittsburgh.

After nine months of operation a second broadcasting station was opened under the same auspices at Newark, N. J., followed shortly by one in Springfield, Mass., and later by one in Chicago, Illinois. The last named made the broadcasting of grand opera by the Chicago Grand Opera Company a special feature, with great success. This extension of service was a direct response to the call for such service by the public at large. The number of those listening is difficult to estimate, but it certainly reaches many thousands. Probably at the present time nearly one million people are listening daily to the broadcasting from these four stations, and this number is being added to each day. That this service has a real appeal is evidenced by the thousands of letters received by the Westinghouse Company and by the participants in the programs, and by the further fact that at least three out of four persons are interested in the subject.

As radio broadcasting is developed today it has one feature not possessed by any other service in existence as, except for the comparatively small cost of the initial installation, it is without favor and without price. Everyone can occupy a "free reserved seat" at any and every radio broadcasting performance. This is an important fact not generally recognized. Several companies are now maintaining broadcasting stations. The only financial support they receive for this costly service is the possible profit from the sale of receiving apparatus of their manufacture; but there are hundreds of other manufacturers and dealers who are manufacturing and selling receiving apparatus also who do not support this service in any way whatever and who, because of the service rendered by others, reap large benefits without exertion or expense on their part.

Radio broadcasting has added the human touch with the public, and should obliterate the feeling that large organizations are heartless. It has been of immeasurable benefit to invalids, many of whom attribute their rapid recovery to this added interest to take their

OVER

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STORY TOLD OF BIRTH OF BROADCAST

Who invented radio broadcasting—not the instrument, but the idea?

This question has been asked of the Radio Editor many times. He has found the answer at last. The story of the vision of the present and future radio broadcasting is an interesting one and, as prepared exclusively for the readers of The Chicago Evening American, will be presented in two installments, the first of which follows:

"Frank, I'm going to close your station."

Paradocical as the statement may seem, this was the actual start of radio broadcasting as we now know it. The concerts on regular schedules, advance programs, entertainment in the air, all came from "closing Frank's station" and opening KDKA, the first radiophone station in the world.

For "Frank" was Frank Conrad, assistant chief engineer of the Westinghouse Company, and the man who made the statement was Harry Phillips Davis, vice president of the Westinghouse Company.

Mr. Davis had come into his office that morning in September, 1920, with an idea. The idea had come to him while reading the advertisement in an evening newspaper.

FINDS IT IN AD.

In a corner of a full-page ad he came across the words, "Mr. Conrad will send out phonograph records this evening." This advertisement was in the interest of the store's amateur radio department, and was explaining to local radio amateurs that Mr. Frank Conrad, who had operated his station intermittently since the war, would send out by radio phonograph records on a certain evening.

The Conrad station was well known to amateurs all over the country, for it was one of the few amateur stations licensed to operate during the war. This special operating was in the interests of government research work which the Westinghouse Company was doing and also to test some apparatus.

Mr. Davis could not forget his idea. He was struck with the fact that the radiophone fundamentally did not lend itself only to private communication, but that it had a universal field of usefulness, and that through it one could communicate to hundreds, thousands or millions; all could listen who had the suitable "ear"—for if a certain class of people were interested enough to listen to music from a few records there was a possibility of increasing this small audience of radio listeners to an enormous number by sending out entertainments, current events, etc., in a regular and interesting manner.

THE IDEA SPREADS.

Why confine one's audience to a small portion of the country?

Why not build a big station and let every one, who wanted to, hear?

Why not make radio broadcasting a public service?

"Frank, my idea is that you stop sending from your station and we will start a regular service from our experimental station here at East Pittsburgh," he said. "We can arrange for a suitable wave length, and I believe if we do this it will be the beginning of a radio broadcasting public service which seems to me to have wonderful possibilities."

The next article will tell of the great expansion of the broadcasting idea and something of the man "who put it over."

Chicago American
June 19, 1922

SINGLE LINE IN PAPER MADE RADIO

The Chicago Evening American Saturday told its readers of the birth of radio broadcasting. The story was that Harry Phillips Davis of the Westinghouse Electric & Manufacturing Company discovered that Frank Conrad, assistant chief engineer of the Westinghouse company, had created quite a clientele in Pittsburgh by broadcasting phonograph records over a small set. Mr. Phillips conceived the idea of broadcasting music, speeches and news on a great scale from a powerful station. How the idea grew is told in today's installment of this interesting bit of radio romance, written exclusively for The Chicago Evening American:

The conference with Mr. Conrad lasted a short time and Mr. Davis called other conferences before actual work on the broadcasting started. It was not until November 11, 1920, KDKA (the broadcasting station at East Pittsburgh) was formally opened with the broadcasting of election returns.

The remainder of the history of KDKA is now common property. Every one, almost, now knows that there are over 200 broadcasting stations in the United States and that the radio audience numbers into the millions each night.

Not every one knows, however, that it was a single line in a newspaper which suggested to the vice president of one of the largest electrical manufacturing companies in the world the big thing of turning a scientific novelty into a new kind of public service by unfolding a new field of communication.

DAVIS A GENIUS.

Mr. Davis was one of the best equipped men in the electrical industry to take up the difficult problems of broadcasting. He has been a leader in the electrical industry since his college days, and has been issued nearly 100 patents covering electrical apparatus. He is an engineering genius and is known not only as a designing engineer of high rank, but also as a man who gets things done. His ability to accomplish results rapidly has already been proved in the history of his company's broadcasting achievements. This ability was also admirably illustrated during the war. He was at that time in charge of production at the East Pittsburgh works, and the duty of fulfilling the government contracts for munitions was his. Probably no more colossal manufacturing task was ever given any one. The quantities involved were enormous, the time limits short, the specifications most rigid; new and undreamed of problems arose at every step; the government's plans changed with bewildering frequency; material, competent help and transportation facilities became almost unobtainable, and innumerable other difficulties were encountered.

NO PROMISE BROKEN.

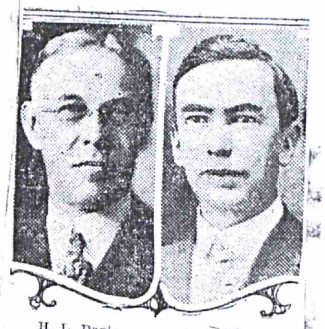
Yet, in spite of everything, the work was done, and it was done properly and on time. Not a single promise made to the government was broken.

This is all by way of illustrating the character of the man who first saw that radio broadcasting was something that held greater possibilities than just being the plaything of the amateur.

Mr. Davis was born at Somersworth, New Hampshire. He was [illegible] the Worcester Poly-

Chicago American,
June 17, 1922

Radio Geniuses



H. L. Davis. Frank Conrad.

The readers of The Chicago Evening American radio page who were interested in the exclusive and romantic story printed Saturday and Monday of the birth and growth of radio broadcasting will be interested also in the above pictures of the two men who made broadcasting possible. At the right is Frank Conrad, assistant engineer of the Westinghouse Electric & Manufacturing Company, whose amateur broadcasting of phonograph records gave to Vice President Harry Phillips Davis of Westinghouse (left) the idea of broadcasting news, concerts, etc., on a nation-wide scale and made radio reception popular.

Radio World
1922

HARRY PHILLIPS DAVIS, president of the Westing Company, entered his office one mo in September, 1920, with an idea. Th had come to him while reading th vertisement in his evening paper. corner of a full page ad, he came a the words, "Mr. Conrad will send phonograph records this evening." advertisement was in the interest o store's amateur radio department was explaining to local radio ama that Mr. Frank Conrad, who had ated his station intermittently since war, would send out by radio phonog records on a certain evening. The rad station was very well known to teurs all over the country, for it was of the few amateur stations license operate during the war. This sp operating was in the interests of ernment research work which the tinghouse Company was doing and to test some apparatus.

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First Radiophone Station

"FRANK, I'm going to close your station."

Paradoxial as the statement may seem, this was the actual start of radio broadcasting as we now know it. The concerts on regular schedules, advance programs, entertainment in the air, all came from closing "Frank's station," and opening KDKA, the first radiophone station in the world to broadcast programs daily.

For "Frank" was Frank Conrad, assistant chief engineer of the Westinghouse company, and the man who made the statement was Harry Phillips Davis, vice president.

Mr. Davis had come into his office that morning in September, 1920, with an idea. The idea had come to him while reading the advertisement in his evening paper. In a corner of a full page ad he came across the words "Mr. Conrad will send out phonographic records this evening." This advertisement was in the interest of the store's amateur radio department and was explaining to local radio amateurs that Frank Conrad, who had operated his station intermittently since the war, would send out by radio phonographic records on a certain evening.

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The remainder of the history of KDKA is now common property. Everyone, almost, now knows that there are about 300 broadcasting stations in the United States and that the radio audience numbers into the millions each night.

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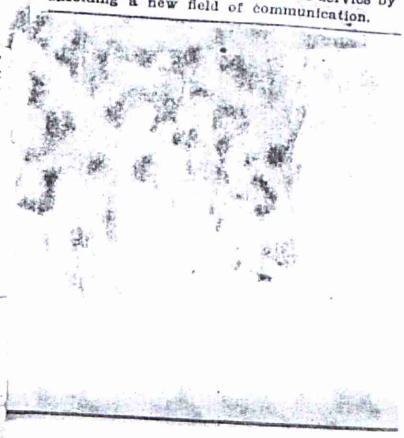

SOMERSWORTH MAN FIRST TO FORESEE POPULARITY OF RADIO BROADCASTING

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Mr. Davis could not forget his idea. He was struck with the fact that the radiophone fundamentally did not lend itself only to private communication but that it had a universal field of usefulness and that through it, one could communicate with hundreds, thousands or millions; all could listen who had the suitable "ear," for if a certain class of people were interested enough to listen to music from a few records there was a possibility of increasing this small audience of radio listeners to an enormous number by sending out entertainments, current events, etc., in a regular and interesting manner. Why confine one's audience to a small portion of the country? Why not build a big station and let everyone, who wants to, hear? Why not make radio broadcasting a public service?

Mr. Davis was so struck with his idea of a public broadcasting service that the first thing he said to his secretary on entering his office the next morning was "Ask Frank to come in."

"Frank," as has been previously ex-

Continued on Page Thirteen

San Francisco- Call

11/13/22

POST * * *California's G*

RADIO PIONEER OF EAST IN S. F.

Harry Phillips Davis, vice president of the Westinghouse Electric and Manufacturing Company, who is said to be the first one to start radiophone broadcasting on a nightly schedule, is paying San Francisco a visit. He is stopping at the Palace Hotel and is accompanied by Henry D. Shute, vice president in charge of the sales of the company.

H. P. DAVIS

Davis, known as "the father of radio broadcasting" is a pioneer in the electrical industry, having been engaged in it since his college days.

Davis and Shute are here for a few days on an inspection tour which includes the factory site at Emeryville, where their company is soon to erect a new plant.

Davis' idea of radio broadcasting is said to have come from an advertisement which he read in a Pittsburgh newspaper. A department store was advertising that it would broadcast the music from phonograph records, and immediately Davis conceived the idea of the large transmitting station on which programs could be held daily.

SOMERSWORTH MAN

Continued From Page One

plained, was Mr. Conrad, who, having been taken so abruptly with his chief's statement, could only listen to what followed.

"Frank, my idea is that you stop sending from your station and we will start a regular service from our experimental station here at East Pittsburgh. We can arrange for a suitable wave length, and I believe that if we do this it will be the beginning of a radio broadcasting public service which seems to me to have wonderful possibilities."

The conference with Mr. Conrad lasted a short time and Mr. Davis called other conferences before actual work on the broadcasting started. It was not until November 11, 1920, that KDKA was formally opened with the broadcasting of election returns.

The remainder of the history of KDKA is now common property. Everyone almost, now knows that there are over 200 broadcasting stations in the United States and that the radio audience numbers into the millions each night.

Not everyone knows, however that it was a single line in a newspaper which suggested to the vice president of one of the largest electrical manufacturing companies in the world, the big thing of turning a scientific novelty into a new kind of public service by unfolding a new field of communication.

Mr. Davis was one of the best equipped men in the electrical industry to take up the difficult problems of broadcasting. He has been a leader in the electrical industry since his college days, and his ability to accomplish results has already been proved in the history of his company's broadcasting achievements. His ability was also admirably illustrated during the war. He was at that time in charge of production at the East Pittsburgh works and the duty of fulfilling the government contracts for munitions was his. Probably no more colossal manufacturing task was ever given anyone. The quantities involved were enormous; the time limits short; the specifications most rigid, new and undreamed of problems arose at every step; the government's plans changed with bewildering frequency; material, competent help, and transportation facilities became almost unobtainable; and innumerable other difficulties were encountered. Yet, in spite of everything, the work was done and it was done properly and on time. Not a single promise made to the government was broken.

HARRY PHIL LIPS DAVIS,
Who Experienced the Radiophone Broadcasting Vision.

This is all by way of illustrating the character of the man who first saw that radio broadcasting was something that held greater possibilities than just being the plaything of the amateur.

Mr. Davis was born at Somersworth, New Hampshire. He graduated from the Worcester Polytechnic Institute with the degree of B. S. in Electrical Engineering in 1890, and after a trip to Europe and a few months spent with the Thompson-Houston Company, entered the Detail Engineering Department of the Westinghouse Company in 1891. In 1896 he was placed in charge of this department; in 1908 he was made manager of the Engineering Department. This position he held until 1911 when he was elected vice president.

Springfield Republican
Springfield, Mass.
June 26, 1922

Radio Broadcasting Vision

estinghouse Vice-President Caught it From Newspaper Ad—Foresaw Its Popular Appeal and Acted Promptly

An insignificant announcement in the corner of a full-page dvertisement may be said to have given birth to the idea of the neral broadcast as we know it today and to Harry Phillips Davis, ce-president of the Westinghouse Electric and Manufacturing com-ny, came the thought that started the company on its radiophone hedule. No, he did not invent the radiophone, but he was the first an to foresee the popular appeal of radio to the public, which has sulted in a vastly increased volume of business and country-wide me for Pittsburg, Newark and East Springfield.

rank, I'm going to close your on."

radoxial as the statement may , this was the actual start of broadcasting as we now know The concerts on regular sched-advance programs, entertain-t in the air, all came from clos-"Frank's station," and opening A. (Pittsburg) the first radio-e station in the world.

r "Frank" was Frank Conrad, stant chief engineer of the stinghouse company, and the man made the statement was Harry llips Davis, vice-president of the stinghouse company.

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HARRY PHILLIPS DAVIS

For the Millions

Mr Davis could not forget his idea. He was struck with the fact that the radiophone fundamentally did not lend itself only to private communication but that it had a universal field of usefulness and that through it one could communicate with hundreds, thousands or millions, all could listen who had the suitable "ear," for if a certain class of people were interested enough to listen to music from few records there was a possibility of increasing this small audience of radio listeners to an enormous number by sending out entertainments, current events, etc., in a regular and interesting manner. Why confine one's audience to a small portion of the country? Why not build a big station and let everyone, who wants to, hear? Why not make radio broadcasting a public service?

Mr Davis was so struck with his idea of a public broadcasting service that the first thing he said to his secretary on entering his office the next morning was "Ask Frank to come in."

"Frank," as has been previously explained, was Mr Conrad, who, having been taken so abruptly with his chief's statement, could only listen to what followed.

"Frank, my idea is that you stop sending from your station and we will start a regular service from our experimental station here at East Pittsburg. We can arrange for a suitable wave length, and I believe that if we do this it will be the beginning of a radio broadcasting public service which seems to me to have wonderful possibilities."

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Just An Ad.

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Mr Davis was one of the best equipped men in the electrical industry to take up the difficult problem of broadcasting. He has been a leader in the electrical industry since his college days, and has been issued nearly 100 patents covering electrical apparatus. He is an engineering genius and is known, not only as a designing engineer of high rank, but also as a man who gets things done. His ability to accomplish results has already been proved in the history of his company's broadcasting achievements.

War Record

His ability was also admirably illustrated during the war. He was at that time in charge of production at the East Pittsburg works and the duty of fulfilling the government contracts for munitions was his. Probably no more colossal manufacturing task was ever given anyone. The quantities involved were enormous; the time limits short; the specifications most rigid, new and undreamed-of problems arose at every step; the government's plans changed with bewildering frequency; material, competent help, and transportation facilities became almost unobtainable; and innumerable other difficulties were encountered. Yet, in spite of everything, the work was done and it was done properly and on time. Not a single promise made to the government was broken.

This is all by way of illustrating the character of the man who first saw that radio broadcasting was something that held greater possibilities than just being the plaything of the amateur.

New York Globe
June 3, 1922

Westinghouse Executive Caught Broadcasting Idea by Line in Pittsburgh Paper

Few men have had so much to do with the development of broadcasting as H. P. Davis, vice-president of the Westinghouse Electric and Manufacturing Company, and few of his influence are so little known to the public. It was he who caught the idea of regular broadcasting programmes from a single line in a Pittsburgh newspaper to the effect that Frank Conrad, an engineer in his employ, would broadcast phonograph records on a certain evening.

Mr. Davis was one of the best equipped men in the electrical industry to take up the difficult problems of broadcasting. He has been a leader in the electrical industry since his college days, and has been issued nearly 100 patents covering electrical apparatus. He is an engineering genius and is known not only as a designing engineer of high rank, but also as a man who gets things done. His ability to accomplish results rapidly has already been proved in the history of his company's broadcasting achievements. This ability was also admirably illustrated during the war. He was at that time in charge of production at the East Pittsburgh works and the duty of fulfilling the government contracts for munitions was his. Probably no more colossal manufacturing task was ever given any one. The quantities involved were enormous, the time limits short, specifications most rigid, new and undreamed of problems arose at every step, the government's plans changed with bewildering frequency; material, competent help, and transportation facilities became almost unobtainable; and innumerable other difficulties were encountered. Yet, in spite of everything, the work was done and it was done properly and on time. Not a single promise made to the government was broken.

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EAST PITTSBURGH, PA., JULY 1922.

East Pittsburgher is Broadcast Inventor

Harry Phillips Davis, Vice-President of W. E. & M. Co., Originator of the Wonderful Service.

ELECTION RETURNS ABOUT FIRST NEWS BROADCASTED.

"Frank I'm going to close your station."

Paradoxial as the statement may seem, this was the actual start of radio broadcasting as we now know it. The concerts on regular schedules, advance programs, entertainment in the air, all came from closing "Frank's station," and opening KDKA, the first radiophone station in the world.

For "Frank" was Frank Conrad, assistant chief engineer of the Westinghouse Company, and the man who made the statement was Harry Phillips Davis, vice president of the Westinghouse company.

Mr. Davis had come into his office that morning in September, 1920, with an idea. The idea had come to him while reading the advertisement in his evening paper. In a corner of a full page ad, he came across the words "Mr. Conrad will send out phonograph records this evening." This advertisement was in the interest of the store's amateur radio department and was explaining to local radio amateurs that Mr. Frank Conrad, who had operated his station intermittently since the war, would send out by radio phonograph records on a certain evening. The Conrad station was very well known to amateurs all over the country, for it was one of the few amateur stations licensed to operate during the war. This special operating research work which the Westinghouse company was doing and also to test some apparatus.

Mr. Davis could not forget his idea. He was struck with the fact that the radiophone fundamentally did not lend itself to private communication but that it had a universal field of usefulness and that through it, one could communicate with hundreds, thousands or millions, all could listen who had the suitable "ear," for if a certain class of people were interested enough to listen to music from a few records there was a possibility of increasing this small audience of radio listeners to an enormous number by sending out entertain-

CONTINUED ON PAGE EIGHT

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CONTINUED FROM FIRST PAGE.

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Mr. Davis was so struck with his idea of a public broadcasting service that the first thing he said to his secretary on entering his office the next morning was "Ask Fred to come in."

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HARRY PHILLIPS DAVIS

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GREAT MEN OF RADIO

IX.—HARRY P. DAVIS

The father of the present day development of wireless, of the concerts on regular schedules, advance programmes, the broadcasting of information of a thousand varieties, the marshalling of world-famed singers and artists behind the radio transmitters of great stations, and the consequent entertainment of millions of persons throughout the nation — undoubtedly was Harry Phillip Davis, vice-president of the Westinghouse company.

In September, 1920, radio was mainly the subject of scientific research and experiment. The devices and instruments necessary for transmitting and receiving wireless messages were not obtainable in the general market. There was practically no popular demand for them, and they were hard to obtain. Prior to the war interest in radio had been growing slowly, but the exigencies of the great struggle stifled it. But in September, 1920, Mr. Davis saw in a newspaper advertisement that Frank Conrad "would send out phonograph records this evening" for amateurs. Mr. Davis envisioned then the future of radio.

Mr. Davis pondered over the matter for several days. He saw that the true field of wireless for a long time to come would not be private communication, but broadcast communication, and the entertainment of hundreds, indeed, millions of persons all over the country. He saw that a station sending out entertainments, concerts, records of current events on regular schedules, was the key to the future. He believed that once such entertainment was broadcast, persons would demand "ears" with which to hear it. He sent for Frank Conrad, who had been in charge of wireless experiments for the government in Pittsburg during the war. He succeeded in closing the Conrad station, and in November, 1920, put into operation, under direction of Mr. Conrad, the KDKA station at East Pittsburg, as a broadcaster of programmes of popular entertainment.

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HARRY P. DAVIS

PITTSBURGH'S BROADCASTING PIONEERS

AN ARTICLE in the *Radio Review* of the New York *Evening Mail* credits Mr. Harry Phillips Davis, vice-president of the Westinghouse Company, with being "the father of the present-day development of wireless, of the concerts on regular schedules, advance programs, the broadcasting of information of a thousand varieties, the marshalling of world-famed singers and artists behind the radio transmitters of great stations, and the consequent entertainment of millions of persons throughout the nation."

Mr. Davis has been associated with the engineering department of the Westinghouse Company since 1891, becoming manager of the department in 1908. Here is the account of the way in which he became interested in the broadcasting problem; and of the decisive action that led to the establishment of KDKA, at Pittsburgh, as the pioneer of present-day broadcasting stations:

"In September, 1920, radio was mainly the subject of scientific research and experiment. The devices and instruments necessary for transmitting and receiving wireless messages were not obtainable in the general market. There was practically no popular demand for them, and they were hard to obtain. Prior to the war interest in radio had been growing slowly, but the exigencies of the great struggle stifled it. But in September, 1920, Mr. Davis saw in a newspaper advertisement that Frank Conrad 'would send out phonograph records this evening' for amateurs. Mr. Davis envisioned then the future of radio.

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Pennsylvania Farmer
Philadelphia, Pa.
May 20, 1922

How Radio Broadcasting Started

Music, Speeehes, Crop and Weather Reports Can Now Be Heard By All Who "Listen In"

WHO started the radio telephone broadcasting?

This question has been asked and answered a number of times during the past year, but so far the correct answer has never been given. And for a very good reason—nobody knew it. The Westinghouse Station KDKA, at Pittsburgh, first to broadcast on a daily schedule, was largely responsible for the present general interest in radio. But it has been so far impossible to discover who conceived the idea of operating KDKA in this manner. We have succeeded in securing full information concerning a meeting, at which the decision to place the station in operation was reached. This meeting, which was held on October 1, 1920, is historic.

Four Westinghouse officials were present. They were Harry P. Davis, vice president; Frank Conrad, assistant chief engineer; M. C. Rypinski, manager of radio sales department, and J. G. McQuiston, manager of the

A BROADCASTING PIONEER.

Harry Phillips Davis, who saw in 1920 that the true field of wireless "would be broadcast communication and the entertainment of hundreds indeed millions of persons all

Should Radiophone Broadcasting Be Continued?

By EDWARD LINWOOD.

N. Y. Globe Sept 30, '22

"IS it your opinion that radiophone broadcasting should be continued in its present form?"

This was the question put to H. P. Davis, vice-president of the Westinghouse Electric and Manufacturing Company, and the man who was responsible for the organizing of the first radiophone broadcasting station in the world, that of KDKA, at East Pittsburgh.

"Instead of answering the question," replied Mr. Davis, "I would like to ask you—

"Who wants radio broadcasting stopped?

"What causes any one to want broadcasting stopped?

"Is the present broadcasting service unsatisfactory?"

The interviewer assured Mr. Davis that there was no real objection to the radiophone, and so far as he knew there was no reason why it should not be continued. This was in answer to Mr. Davis's first question in reply.

"Broadcasting," he continued, "has become a public necessity and is rapidly lining itself up with other utilities such as the telephone, telegraph, electric light, moving pictures, etc., and just as these activities were crude in their beginnings but later refined to present-day conditions, so, in the same way, will radiophone broadcasting be developed and will cover and make available to all within hearing range all worth-while activities of general interest to the public."

When Mr. Davis was asked if present conditions under which radiophone broadcasting was done, wherein a free service was given, would be continued, he stated in reply that a service of this character offered such benefits to mankind in general that way would be found for its continuance.

"Why," he said, "consider the effect of discontinuing operations at our four stations! We believe that the combined audience of our four broadcasting stations is at least a million every night in the week. It may be more. This estimate is based on the number of radio receivers which have been sold in the territories covered by these stations. What would be the result if all broadcasting stations stopped suddenly, with or without warning, entertaining and informing this vast audience? The effect upon this radio audience would be about the same as would occur if we took away some one or more of the utilities already referred to, such as the electric light, or the telephone—and we might go even further and say that it might be the same as stopping the newspapers and magazines, and the cutting off of amusements and communications. The effect probably right now would not be so vital as it will be later, as the service improves and grows—as it is bound to do."

"What would happen if this occurred?" was asked of Mr. Davis.

"You know as well as I do," he said, "that there would be a public clamor that would quickly bring some solution of a state or federal nature. I do not believe however, that this can happen, as there is enough commercial possibility and good-will in the business to make it worth while for those companies that can benefit from it to continue the service."

"What is going to happen," Mr. Davis was asked, "if the federal government continues its present policy of indiscriminately licensing all applicants to broadcast?"

"Now," said Mr. Davis, "you have touched on the real, vital point. It is my opinion that the public is not going to stay interested in, nor will it support, an activity which does not at least approximate a real and satisfactory service. When it becomes possible, as it is now, for any one with a broadcasting set—good, bad or indifferent—to claim space in the ether and to force himself upon the listening public without furnishing quality or a programme of interest, the public is going

H. P. Davis

to become disgusted and, as a result, interest will flag—for under circumstances of this kind worth-while service cannot be given by those companies or stations which have the ability and facility to provide a real service, because of this interference. This is a real danger, as will probably be recognized this fall when receiving conditions become better and hundreds of stations which have been licensed grow more active."

"Naturally, then, you must have some opinion in regard to a way that radio broadcasting should be developed."

To this, Mr. Davis replied, "I have. I have always maintained that, like the telephone and the telegraph, the service is inherently monopolistic in character, and to get the best results, the best programmes, the greatest development, the activity should be confined to two or three companies of established reputation, having the necessary facilities and incentive to develop it; that they should be under federal control and be allowed this privilege as long as they have acceptable service."

"As you object to the large number of stations the government has licensed, how many do you think sufficient?"

Mr. Davis answered that he believed five or six large, powerful, well-located stations would be sufficient to cover this continent; that these stations should have separate wave bands, and that no other stations should be licensed that would in any way be capable of interfering with the transmission from these large, powerful stations. For local purposes there should be a network of low powered local stations on non-interfering wave bands. These stations should be capable of relaying the big stations' services for their immediate vicinity, and should be able to furnish for their locality matters of local interest.

"Do you think, even with this programme, that the few companies who would be given the broadcasting privileges by the government would guarantee permanency of service?"

"That is a hard question to answer," Mr. Davis replied, "but I think it quite probable they would. However, at this period in broadcasting history it is difficult to foresee the future evolution and development. I believe that if these central stations could be licensed, protected and organized, a great step forward would be made, and that it would become a matter of such public value that endowments or federal subsidies would be possible which would assist those responsible for the service to carry it on and to continue the development and research required to get the most value out of it."

Talking With 'Planes While in Flight

(Continued From First Page.)

the 'plane and connected together by wires strapped along the entering edge of the outer struts. The lead-in wires were taken from the upper portion of the loop and run into the radio compartment, as indicated in Fig. 1. The fore and aft coils can be wound in the fabric supports of the fuselage and consisted of three turns on either side of same. The dimensions of each loop were 30x4 feet.

The tail coil used in connection with the development on the twin-motored Martin 'plane is located at station No. 6, in the fuselage of the ship. (See Fig. 1.) This station has dimensions 56x36 inches, 56 inches deep. The coil is mounted so as to revolve on a shaft set in bearings fixed to longerons. The coil itself measures 40 inches on a side, and is composed of twelve turns of No. 22 double cotton-covered copper wire, spaced ⅛ inch apart. The centre of the coil is located 144 inches from the centre of the radio compartment, in which the transmitting set, amplifier, and batteries are mounted.

The radio compartment measures 45x36x24 inches deep. Attached to the shaft of the radio compass frame is a 10 inch scale, calibrated in degrees from zero to 360. This indicator is two inches above the turtle back and is readily visible from the compartment in which the operator sits. The coil frame is revolved mechanically by a system of pulleys over which a controlling wire is run, and anchored to both drums of the tail coil and controlling wheel in the radio compartment.

(To Be Continued.)

Express
Angeles, Cal.
ov. 12, 1922.

RICAL MEN PLIMENT L. A.

n California is indeed to be served by such power generation com- an electric railway sys- on a par with the best ted States," said H. D. president of the West- lectric & Manufacturing who, in company with is, also an official, are eles to inspect the new ise plant here.

here from the hazy city rgh to your delightful where electricity has the smokestack and facturing plants operat- speed, is indeed an in- id a pleasure.

iness outlook for 1923 is y bright; especially is the Pacific Southwest building program has nternational attention."

Los Angeles, Mr. Davis hute will hold a con- n K. E. VanKuran, dis- er for Westinghouse. , vice president of the n charge of production ring, stated that he was essed with the manu- ossibilities of the Pa- Mr. Davis is inter- known as the "Father adcasting," and has the f placing into operation uccessful broadcasting he United States.

Tribune,
Oakland, Cal.
Nov. 12, 1922

WESTINGHOUSE HEAD HERE TO INSPECT SITE

Work on New Emeryville Plant to Begin Soon, Says Official

The Emeryville manufacturing site, which was purchased some months ago by the Westinghouse Electric and Manufacturing company, will soon accommodate a plant which will manufacture and assemble electrical machinery and radio apparatus.

H. P. Davis, known as the "father of radiophone broadcasting," is here to inspect the site and to make immediate recommendations for the erection of a plant, service department and assembling works. Davis is vice-president of the company and one of the foremost electrical engineers in the United States.

According to Davis, the plant which the company intends to erect will employ several thousand men. It will be the third largest plant of this company on the Pacific coast, the others being located at Los Angeles and Seattle.

Davis is credited as being the first to visualize the idea of broadcasting musical and professional programs on regular schedules by radiophone. He was chief promotor of the first large station of this kind. This station is now known as KDKA, a call letter familiar to every radio fan in the east.

The equipment to be used in the new building will be as up-to-date and modern as it is possible to make it. Electricity is to be employed wherever it can be used efficiently for the production of light, heat, and power. The electrical equipment is being designed specially by the Westinghouse engineers themselves. Because of the peculiar advantage the engineers have in this case in designing equipment for their own plant, the announcement of the awaited with some interest by local detailed specifications is being architects and engineers.

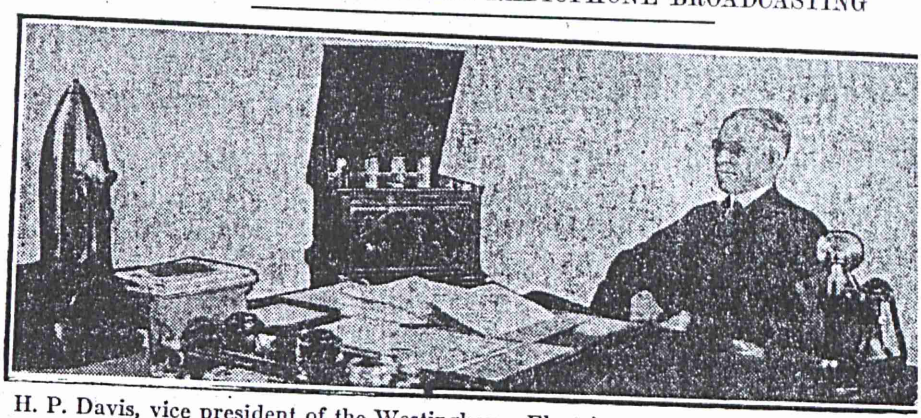
Davis is accompanied by Henry D. Shute, also a vice-president and salesmanager of the company.

The Pittsburg Dispatch Sunday, September 24, 1922.

Radio Diges

Why Broadcasting Should Be Continued by Radiopho

AN INTERVIEW WITH H. P. DAVIS, VICE PRESIDENT OF THE WE INGHOUSE ELECTRIC AND MANUFACTURING COMPANY, WHO IS THI ORIGINATOR OF THE MODERN RADIOPHONE BROADCASTING



H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company

"You have asked me, 'why should radiophone broadcasting be continued?' I cannot find any answer to that question, as it seems so perfectly obvious to me that radiophone broadcasting has come to stay. Instead of answering I would ask:

"Who wants radio broadcasting stopped?

"What causes anyone to want broadcasting stopped?

"Is the present broadcasting service unsatisfactory?

"If it is unsatisfactory, this should not be a cause for discontinuing it, but rather a reason for greater effort at improvement."

It was evident at once from his replies that H P Davis, vice president of the Westinghouse Electric and Manufacturing Company, had been surprised that anyone should ask such a question. And little wonder, for the man who was responsible for organizing the first radiophone broadcasting station in the world—this poineer station being KDKA at East Pittsburg—and the installing of three other stations (KYW at Chicago, Ill, WJZ at Newark, N J, and WBZ at Springfield, Mass, has been closely in touch with radio for the past two and a half years and had evidently detected no demand from the public for cessation of radiophone broadcasting activities.

Mr Davis called to the interviewer's attention the wonderful and phenomenal spread of popular interest in radiophone broadcasting, and stated that he believed that this interest was not waning, but was increasing.

Public Necessity

"You have asked me why radiophone broadcasting should be continued," said Mr Davis. "Perhaps I can answer your question best by saying that I can tell you many reasons why radiophone broadcasting should not be stopped."

The interviewer assured Mr Davis that there was no real objection to the radiophone, and so far as he knew there was no reason why it should not be continued. This was in answer to Mr Davis' first question in reply.

"Broadcasting," he continued, "has become a public necessity and is rapidly lining itself up with other utilities, such as the telephone, telegraph, electric light, moving pictures, etc, and just as these activities were crude in their beginnings but later refined to present-day conditions, so, in the same way, will radiophone broadcasting be developed and will cover and make available to all within hearing range, all worth-while activities of general interest to the public."

When Mr Davis was asked if present conditions under which radiophone broadcasting was done, wherein a free service was given, would be continued, he stated in reply that a service of this character offered such benefits to mankind in general, that way would be found for its continuance.

Audience of Million

"Why," he said, "consider the effect of discontinuing operations at our four stations! We believe that the combined audience of our four broadcasting stations is at least a million every night in the week. This estimate is based on the number of radio receivers which have been sold in the territories covered by these stations. What would be the result if all broadcasting stations stopped suddenly, with or without warning, entertaining and informing this vast audience? The effect upon this radio audience would be about the same as would occur if we took away some one or more of the utilities already referred to, such as the electric light, or the telephone—and we might go even further and say that it might be the same as stopping the newspapers and magazines and the cutting off of amusements and communications. The effect probably right now would not be so vital as it will be later, as the service improves and grows—as it is bound to do."

"What would happen if this occurred?" was asked of Mr Davis.

"You know as well as I do," he said, "that there would be a public clamor that would quickly bring some solution of a State or Federal nature. I do not believe, however, that this can happen, as there is enough commercial possibility and good-will in the business to make it worth while for those companies that can benefit from it, to continue the service."

Licensing Applicants

"What is going to happen," Mr Davis was asked, "if the Federal Government continues its present policy of indiscriminately licensing all applicants to broadcast?"

"Now," said Mr Davis, "you have touched on the real, vital point. It is my opinion that the public is not going to stay interested in, nor will it support an activity which does not at least approximate a real and satisfactory service. When it becomes possible, as it is now, for anyone with a broadcasting set, good, bad or indifferent, to claim space in the ether and to force themselves upon listening public, without furnis quality or a program of interest, public is going to become disgusted as a result interest will fag—for u circumstances of this kind worth-w service cannot be given by those panies or stations who have the ab and facility to provide a real ser because of this interference. This real danger, as will probably be re nized this fall when receiving condit become better and hundreds of stat which have been licensed grow more tive."

"Naturally, then, you must have s opinion in regard to a way that r broadcasting should be developed."

To this, Mr Davis replied, "I have have always maintained that, like telephone and the telegraph, the serv is inherently monopolistic in charac and to get the best results, the best p grams, the greatest development, the tivity should be confined to two or th companies of established reputation, h ing the necessary facilities and incent to develop it; that they should be un Federal control and be allowed this pr ilege as long as they have acceptal service."

"As you object to the large number stations the Government has licens how many do you think sufficient?"

Covering Continent

Mr Davis answered that he believ five or six large, powerful, well locat stations would be sufficient to cover th continent; that these stations shou have separate wave bands, and that other stations should be licensed th would in any way be capable of interfe ing with the transmission from the large powerful stations. For local pu poses there should be a network of lo powered local stations on non-interferin wave bands. These stations should b capable of relaying the big stations' ser ices for their immediate vicinity, an should be able to furnish for their loca ity matters of local interest.

"Do you think, even with this pro gram, that the few companies who woul be given the broadcasting privileges b the Government would guarantee perma pency of service?"

"That is a hard question to answer," Mr Davis replied, "but I think it quite probable they would. However, at this period in broadcasting history it is diffi cult to foresee the future evolution and development. I believe that if these cen tral stations could be licensed, protected and organized, a great step forward would be made, and that it would become a matter of such public value, that en dowments or Federal subsidies would be possible which would assist those respon sible for the service to carry it on and to continue the development and research required to get the most value out of it."

"What about the Westinghouse Com pany?"

"I feel that, in answer to that, I can say for the Westinghouse Company that it will not stop a worthwhile service. We realize the great value of the accruing good-will to the whole electrical industry which has come from radio broadcasting; and we further realize the responsibility we have undertaken, and it is our determination to do our share in the perfecting and developing of this important public service. So you see that there is really no reason why we should stop, as long as there is a service to the public to be fulfilled."

THE BULLETIN: SAN FRANCISCO, MONDAY, NOVEMBER 13, 1922.

PLAN RADIO PLANT FOR EMERYVILLE

Harry Phillips Davis, known as the "Father of Radiophone Broadcasting," in company with Henry D. Shute, vice-president in charge of sales for the Westinghouse Electric and Manufacturing Company, are in San Francisco to inspect the factory site in Emeryville on which the company soon will erect its new plant. They are at the Palace Hotel.

Davis has been credited with the first conception of the Eastern system of large radiophone broadcasting stations, such as those at Pittsburg, Chicago, Newark and Springfield. He also visualized the broadcasting of program on regular schedules, and was the chief promoter of the first large station operated under this system.

The Westinghouse Company is planning to erect one of the largest plants around the bay at its Emeryville site, and will maintain a large service department, much larger warehouse facilities than are now in use, and manufacturing and assembling machinery which will supply employment for several thousand persons.

Davis and Shute, because of their respective positions, are both particularly interested in the new plant. On their return to Pittsburg they will make a report to the general management of their company, after which the work on the plant will commence as soon as possible.

Father of Radio

H. P. Davis, credited with first conceiving large radio broadcasting stations in the East.

RADIO PIONEER OF EAST IN S. F.

Harry Phillips Davis, vice president of the Westinghouse Electric and Manufacturing Company, who is said to be the first one to start radiophone broadcasting on a nightly schedule, is paying San Francisco a visit. He is stopping at the Palace Hotel and is accompanied by Henry D. Shute, vice president in charge of the sales of the company.

H. P. DAVIS

Davis, known as "the father of radio broadcasting" is a pioneer in the electrical industry, having been engaged in it since his college days.

Davis and Shute are here for a few days on an inspection tour which includes the factory site at Emeryville, where their company is soon to erect a new plant.

Davis' idea of radio broadcasting is said to have come from an advertisement which he read in a Pittsburgh newspaper. A department store was advertising that it would broadcast the music from phonograph records, and immediately Da-

Call and Post
San Francisco, Cal.
Nov. 13, 1922.

CONTINUED PROSPERITY PREDICTED

Westinghouse Officials on Visit Here Astonished at Activity on Coast

Arriving in Los Angeles this morning, Vice-President H. D. Shute, and H. P. Davis of the executive staff, Westinghouse Electric and Manufacturing Company, Pittsburg, went immediately to the new Westinghouse Building for a conference with K. E. VanKuran, district manager, and an inspection of the new headquarters of the Westinghouse Company for the Pacific Southwest. Mr. Shute expressed astonishment of the industrial advancement of the Pacific Coast.

"The business outlook for 1923 is exceptionally bright, especially is this so for the Pacific Southwest, where your building program has been at such a rate as to attract international attention," he said.

"Southern California is indeed fortunate to be served by such progressive power generation companies and an electric railway system that is on par with the best in the United States. A great deal of credit is due to the far-seeing officials of these public utilities who have anticipated the mighty growth of the West and kept growth its ever-increasing demands for power, light, heat and transportation."

Mr. Davis, in charge of production and engineering for the Westinghouse interests, stated that he was deeply impressed with the manufacturing possibilities of the Pacific Coast. Mr. Davis, who is popularly known as "The Father of the Radio Broadcasting Station," will speak tonight on the "Future of Radio" from The Times' broadcasting station.

Radio Notables Make Inspection Tour of Westinghouse Studio

Special Concert Given By KDKA as Test For Visitors.

ARE GUESTS OF OFFICIAL

Station KDKA, the pioneer broadcasting station of the world, was visited and inspected yesterday by more radio notables than ever have visited Pittsburgh before. The group included: Major E. H. Armstrong, inventor of the Armstrong regenerative and super-regenerative circuits; E. E. Bucher, manager of sales for the Radio Corporation of America; David Sarnoff, vice president and general manager of the Radio Corporation; A. Van Dyke, Radio Corporation; E. E. Mallory, manager of A. Stine of the General Electric Company, and Dr. A. Goldsmith, director of research for the Radio Corporation.

These men were guests of H. P. Davis, vice president of the Westinghouse Electric Company, himself recognized as the "father of broadcasting." They came to Pittsburgh yesterday to inspect Station KDKA and left for New York last night without making any comment on the future of radio broadcasting.

Other Westinghouse officials who were in conference with the radio generals were S. M. Kintner, manager of the research laboratory; L. W. Chubb, manager of the radio engineering department; Frank Conrad, assistant chief engineer, and others.

The inspection trip of KDKA was held yesterday afternoon. Last night the men were guests of H. P. Davis at his home in 1917 Wallingford street, East End. A special radio concert was broadcast from KDKA in honor of the guests and partly to test the expert-

St. Louis, Mo.
Nov. 24, 1922

PIONEER BROADCASTER PRAISES K S D WORK

Vice-President Davis of Westinghouse Co. Has Little Faith in Commercial Future of Radio.

The radio is essentially a device for amusement and information of the people, and of no great commercial value, such as the transfer of private messages, said H. P. Davis, a vice president of the Westinghouse Electric and Manufacturing Co., and one of the pioneers in broadcasting development in America, when in St. Louis Thursday with H. D. Shute, another vice president of the company, en route to Pittsburg at an inspection trip to the Pacific Coast.

Davis was in charge of the establishment and management of the Westinghouse broadcasting station, K D K A, in Pittsburg, the pioneer station in introducing nightly programs.

Enthusiastic comment was made by Davis on the Post-Dispatch station, K S D. He spoke of its power and clarity, saying he often had heard its programs on the loud speaker at the Pittsburg stations. He especially stressed the efficient announcing of station K S D.

Doubts Commercial Future.

"I do not believe there is any commercial future for the radio," Davis said, "except in the manufacture and sale of the necessary instruments. The radio is for the transmission of news, which you want to tell the world about, and not for private and confidential communication. Another difficulty to be met with in personal transmission is the conflict of the wave lengths.

"I realize that several inventors are experimenting with instruments by which whith they hope to make radio messages secret. But if such were discovered, it probably would not be long before some other ingenious person found a means by which the secret message could be intercepted.

"No, I believe the radio's future lies in the dispersing of news and the broadcasting of amusement features. It should be a great medium of public enjoyment, especially to persons living in sparsely settled regions, the northwest and the southwest.

Advantage Not Taken by All.

"Many of them have not yet taken advantage of radio, chiefly because no great initiative has been displayed by the dealers of instruments in those places. Any many have purchased poor instruments, which have caused people to lose confidence in broadcasting efficiency.

"Much is yet to be accomplished in both broadcasting and receiving. I hardly would dare to prophesy the final attainments which may be expected."

Davis does not believe that as many broadcasting stations as are now in operation will be maintained because of the great cost. However, he thinks such a decrease may be offset by an increasing demand. The colleges and technical institutions are showing much interest in radio development, Davis says, and while none of them has established courses in radio engineering, the subject is

Here to Open Plant

Westinghouse Company Officials

who have arrived in Los Angeles to inspect the company's big new building at Fourth and San Pedro streets. Left to right are K. E. Van Kuren, district manager for the company; H. P. Davis and H. D. Shute, vice-presidents.

The ground floor will be used primarily for receiving and shipping facilities and is equipped for both trucking and rail facilities. Each aisle has an individually operated electric crane with sufficient capacity to handle practically any size electrical unit. There are two aisles laid aside on the ground floor, one for the warehousing of large electrical units and the other for the servicing of heavy units is equipped with a ten-ton crane, one of the largest cranes installed in the Pacific Southwest.

The second floor will house the light manufacturing and extensive servicing departments. The balance of the floors will be used for warehousing and other purposes, the sixth floor being devoted exclusively to the clerical, engineering, sales and executive offices.

[illegible]h Mr. Davis and Mr. Shute very favorably impressed [illegible]he new Westinghouse headquarters for the Pacific Southwest and stated with the big investment that had been made in Los Angeles by the Westinghouse interests, the company could now be looked upon as one of the largest of Southern California's home industries.

Los Angeles Times,
Los Angeles, Cal.
Nov. 16, 1922.

FATHER OF BROADCAST WILL TALK

H. P. Davis, Famed Engineer, Will Speak Over KHJ

Radio listeers tonight will hear "the father of radio broadcasting," H. P. Davis, vice-president, Westinghouse Electric & Manufacturing Company, who will talk from KHJ. Mr. Davis has international reputation as a leader in the development of radio apparatus and has the distinction of placing in operating the first sucessful broadcasting-station in the United States.

He is an engineering genius and is known not only as a designing engineer of high rank but also an operating executive who gets things done. His ability to accomplish results rapidly has already been proved in the history of the Westinghouse Company's broadcast experience. This ability was also admirably illustrated in the war, when he had charge of the company's production and the duty of negotiating and fulfilling the United States and British governments' contracts for munitions.

The quantities involved were enormous; the time limits short; the specifications most rigid; new problems arose at every step; buildings had to be erected in a few week's time; the government's plans changed with bewildering frequency; material, competent help, and transportation facilities became almost unobtainable; and innumerable other difficulties were encountered. Yet, in spite of everything, the work was done and it wos done properly and on time.

This is all by way of illustrating the character of the man who first saw that radio broadcasting was something that held greater possibilities than just being a plaything of the radio amateur.

[illegible] Express
Los Angeles, Cal.
Nov. 16, 1922.

ELECTRICAL MEN COMPLIMENT L. A.

"Southern California is indeed fortunate to be served by such progressive power generation companies and an electric railway system that is on a par with the best in the United States," said H. D. Shute, vice president of the Westinghouse Electric & Manufacturing Company, who, in company with H. P. Davis, also an official, are in Los Angeles to inspect the new Westinghouse plant here.

"Coming here from the hazy city of Pittsburgh to your delightful Southland, where electricity has supplanted the smokestack and your manufacturing plants operating at top speed, is indeed an inspiration and a pleasure.

"The business outlook for 1923 is exceptionally bright; especially is this so for the Pacific Southwest where your building program has attracted international attention."

While in Los Angeles, Mr. Davis and Mr. Shute will hold a conference with K. E. VanKuran, district manager for Westinghouse.

Mr. Davis, vice president of the company, in charge of production and engineering, stated that he was deeply impressed with the manufacturing possibilities of the Pacific coast. Mr. Davis is internationally known as the "Father of radio broadcasting," and has the distinction of placing into operation the first successful broadcasting station in the United States.

Post-Enquirer
Oakland, Cal.
Nov. 18, 1922.

ELECTRIC CO. WILL BUILD PLANT

Plans are now under way by the Westinghouse Manufacturing & Electric Company to start immediate construction of a million-dollar plant on a twelve and one-half acre site at the foot of Powell street in Emeryville, the ever growing manufacturing section of the east bay district.

H. D. Shute

The new plant will give employment to over two thousand people. It will house an extensive service department, will have large warehouse facilities. The factory will turn out electrical machinery and various electrical appliances. The electrical equipment for the new plant is being designed by Westinghouse engineers.

H. P. Davis

H. P. Davis, known as the father of radio broadcasting, in company with Henry D. Shute, both vice presidents of the Westinghouse Electric Company, inspected the factory site at Emeryville yesterday, they having come here from Pittsburgh, Pennsylvania, to pave the way for actual construction. Davis is works manager of the Westinghouse Company, while Shute is in charge of sales.

The local plant will be one of three large Westinghouse units on the Pacific coast. Seattle and Los Angeles have mammoth plants of this concern. After making a survey of both sides of the bay the company purchased the site here some three years ago but delayed building activity until now. Material for the plant will be on the site within a few weeks.

Mayor W. H. Christy, Marshall E. J. Cary and City Engineer R. S. Hawley of Emeryville, in conjunction with the Emeryville Manufacturers' Association, have played an important part in bringing about the plans for immediate construction of the new plant in Emeryville.

Pittsburgh Post Gazette
Dec. 19, 1922

Greatest Program In Annals of Radio Given in Post Studio

Dr. Mann, Ziegfeld and H. P. Davis, Chief Features.

MUSIC ALSO IS BROADCAST

Innumerable thousands scattered over a continent were treated to one of the greatest programs in the annals of radio telephony last night, when, from The Pittsburgh Post studio of the Westinghouse broadcasting station KDKA, three prominent personages in widely diversified fields made addresses.

These three speakers, who created a precedent by appearing on the same program, were Rev. Dr. Alexander Mann, newly-elected bishop of the Episcopal diocese of Pittsburgh; Florenz Ziegfeld, Jr., famous musical comedy magnate, and H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company and "father" of radio broadcasting.

The addresses made by these men were in addition to the regular KDKA program, which was featured by a concert by the combined Pitt Glee Club and Mandolin Club.

Never before since the advent of radio broadcasting has anything like last night's concert and program been given. At 7 o'clock Mr. Ziegfeld began speaking. Although his medium of expression is generally regarded as visible beauty, the speaker gave to his unseen audience some interesting and illuminating remarks relative to that field in which he has won international fame. Following Mr. Ziegfeld's address, there was given the usual "news," "bedtime story" and other features for which the KDKA programs are noted.

Mr. Davis spoke at 8 o'clock. His talk was composed of "Introductory Remarks" regarding a series of 15 radio talks on popular and technical radio problems, which he will give from The The Post studio. His address of last night was technical, but of great interest to those thousands concerned with the radio and its field.

Musical numbers occupied the time between the close of Mr. Davis' address and the beginning of Dr. Mann's remarks. The bishop-elect began speaking at 9 o'clock. He was introduced by Rev. Dr. E. J. Van Etten, rector of Calvary Episcopal church, Shady avenue. He said in part:

"I have been asked to say a word by radio. After a three days' visit in Pittsburgh, which is to be my new home, I am leaving tonight for Boston. The world possibly may be 'listening in,' but what I have to say will, I fancy, be of no special interest outside our two cities: Boston, my home for 17 years, and Pittsburgh, which is to be my home for the yedrs to come.

"Boston and Pittsburgh—it would be hard to name two American cities wherein the popular mind shows greater contrast. And yet my thought tonight is dwelling not on the difference but on the resemblances. The thing which has impressed me is the contrast of location. Climate, architecture and perhaps atmosphere are the underlying values which are identical. Courtesy and kindliness are here what they are there. The spirit of fellowship and good will is the same in both cities. Good citizenship is facing the same problems in Pittsburgh as in Boston. The campaign against ignorance and crime is the same here as there. Good men and good women are in both cities the uniformly valuable assets. And religion, the same as personal responsibility to God, is in Pittsburgh as in Boston, the one solution of the great social and political problems for which neither sermons nor laws can ever be a substitute."

The Pitt Glee Club and the Mandolin Club, directed respectively by T. Earle Fearsly and George R. McNemry, concluded the program with a collection of interesting instrumental and vocal numbers. There were readings by Phyllis L. Newlands.

Electrical Men See Promise on Coast

H. D. Shute, vice president in charge of sales, and H. P. Davis, vice president in charge of engineering and production of the Westinghouse Electric & Manufacturing Company, spent last week in Seattle as part of a Western tour in the interests of the company. Both men expressed themselves as being favorably impressed with the possibility for developing of the electrical industry on the Pacific Coast.

[illegible] Dec 19 22

Bishop Mann Gives Radio Talk Tonight

Tarkington, Ziegfeld and Davis Also to Speak.

Rev. Dr. Alexander Mann of Boston, newly elected bishop of the Episcopal diocese of Pittsburgh, tonight will make his first public address in this city since his election, when he will speak from The Pittsburgh Post studio of the Westinghouse radio broadcasting station KDKA. Dr. Mann's talk will begin promptly at 9 o'clock.

Although the new bishop has not designated the subject upon which he will speak, it is known that he will have something of interest to say to Pittsburghers in general. It is significant that the ecclesiastic has chosen the radio as the agency by which, in his first important address to reach the thousands interested in his election and installation as bishop of this city.

Preceding the bishop's address at 7 o'clock, two famous personages in their respective fields will entertain the invisible audience of The Post Studio. These are Florenz Ziegfeld, Jr., of "Follies" fame, and Booth Tarkington, noted author. Ziegfeld is in Pittsburgh this week with his wife, Billie Burke, who is starring in "Rose Briar" at the Nixon Theater. Tarkington is author of the play.

The Independent Inter-Weekly for Schools

Radio Broadcasting as a Factor in American Life

December 2, 1922.

By William H. Easton, Ph. D.,
Westinghouse Electric and Manufacturing Company

WHY did radio become so widely popular in so short a time? This is one of the several mysteries connected with this mysterious art. The rapidity with which it swept the country is without parallel. Even those directly engaged in its development were astounded at the result of their efforts; and they are still uncertain as to why it happened.

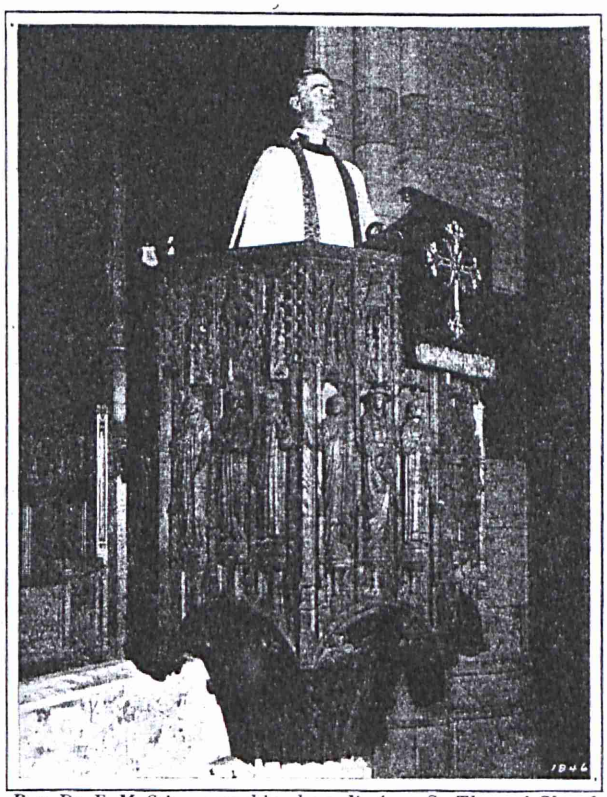
H. P. Davis, the Father of Broadcasting

Curiosity, of course, played a large part in the radio craze of last year. To hear music played 100 or 1,000 miles away was so extraordinary an experience that everyone had to have the apparatus which enabled them to do so. But something more than curiosity had to be involved, or else, now that curiosity is generally satisfied, radio would die out, just as did the kaleidoscope and the ouija board. Many prophesied this would occur, but it did not. Interest in radio is greater today than it ever has been; and no one who has access to the mail which pours daily into every well-managed broadcasting station can be persuaded that this new art is ephemeral. There is too sincere a tone of gratitude, too much evidence of long-continued listening-in, in these letters to indicate a passing fad.

An illuminating explanation for the general appeal of radio is, quite unintentionally, supplied by Stuart P. Sherman, of the University of Illinois. In an article in the November *Atlantic*, Prof. Sherman discusses the outstanding desires of the average American at various periods of our history. Summing up his conclusions, he says:

> In our first period [*i. e.* from 1776 to about 1865] he [the average American] wanted a stable government; and he got it, and wholeheartedly glorified the political and military heroes who gave it to him. In his second period [1865 to 1900] he wanted a rapid and wide diffusion of the material instruments of civilized life; he got them, and wholeheartedly glorified the industrial heroes who provided them. In his third period [the present], the average man is growing almost as scornful of "wealth and pomp and equipage," as John Quincy Adams. The captains of industry are no longer his heroes; they have communicated to him what they had of virtue for their hour. What the average man now wants is the large-scale production and the wide diffusion of science, art, music, literature, health, recreation, manners, human intercourse, happiness—the best to be had; and he is going to get them and to glorify wholeheartedly the heroes of culture who provide them for him.

If this be true, then there is no wonder that interest in radio broadcasting spread so rapidly; for here is the most effective medium ever invented for "the large-scale production and widespread diffusion" of science, music, and literature, culture, philosophy, and religion. Today, a boy with a simple receiver on an Iowa farm can get more of these things than could a New York millionaire of two years ago. Without effort and at practically no expense, he can hear the complete per-



Rev. Dr. E. M. Stires preaching by radio from St. Thomas' Church

formances of the Chicago Opera Company, concerts by the St. Louis, Detroit, and New York City symphony orchestras, organ recitals, oratorios, solos innumerable by artists of every kind and degree, and jazz to the limits of his endurance. In addition, and as a foil to too much music, he hears talks and readings by scientists, literary men, and entertainers; Shakespearean recitals; sporting events, graphically described, direct from the scene of action; and sermons by preachers of every creed and denomination.

Above all, the radio relieves the barrenness of the material life of the average American, and brings directly to the whole people those aesthetic and intellectual pleasures which have heretofore been enjoyed only by the very few. It supplies a want that is just as real as the desire for political freedom or for physical comfort. Culture has been the quest of Europe for centuries, but until recently we Americans have not felt the need of it, as a nation, because our chief interest lay in the exploitation of our vast natural resources. But the days of the "Winning of the West," of railroad construction, and other great new enterprises, are over for us, and we find ourselves wealthy, but (in Carlyle's words, quoted by Prof. Sherman) *bores*. Radio gives us, in a typical American way, the means to round out our lives, and we have welcomed it with typical American enthusiasm.

The one danger from radio culture lies in surfeit; but this danger is probably not great. The listener attends only to those things that really interest him, and, because of the wide variety of things filling the ether, he has ample material from which to make a selection. And as experience grows, taste improves. There is ample evidence of this. Better and better things are constantly being demanded by the public; and each artistic improvement made by the broadcasters receives instant praise. Nor is the listener, however isolated, dependent upon radio alone. He turns eagerly to the books and magazines that explain the things he hears and that assist in widening his horizon. Thus, he is led easily into literature, which, too often, meant nothing whatever to his fathers.

The radio is certain to become a vital factor in politics. From now on, millions of our citizens will get their political information at first hand, instead of at second, third, or fourth hand as at present; and this can hardly fail to stimulate the active popular interest in governmental affairs that is today one of our foremost needs. Furthermore, the candidate, when speaking by radio, must realize that his audience is not simply a crowd of his own sympathizers, but is a perfect cross-section of the public at large. Facts, and not "hokum," can alone win such an audience; and promises made to it are not lightly to be broken. Is it not permissible to hope that the result of all this will be a better general understanding of our important political and economic issues and an improvement in the calibre of our public servants?

Post–KDKA Fans To Hear These Men Tonight

A treat is in store for radio enthusiasts tonight, when four men well known in their respective professions will be the speakers. They are, left to right, Dr. Alexander Mann, newly elected bishop of the Protestant Episcopal diocese of Pittsburgh; Booth Tarkington, noted author; Florenz Ziegfeld, Jr., of "Follies" fame, and H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company.

WESTINGHOUSE RADIO PROGRAM FOR TODAY

6:15 p.m.—Dinner concert by KDKA Little Symphony Orchestra, under the direction of Victor Saudek.
7:00—F. Ziegfeld, Jr., and Booth Tarkington will speak.
7:15—News.
Tri-weekly letter from "Farm and Home."
7:30—Bedtime story for the children.
7:15—Summary of the New York stock exchange.
Weekly summary of "The Iron Age."
8:00—"Making the Right Start With a Savings Account," by W. O. Phillips, cashier Diamond National Bank of Pittsburgh, from The Pittsburgh Post studio.
H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, East Pittsburgh, will give the "Introductory Remarks" regarding a series of 15 radio talks on popular and technical radio problems, from the Pittsburgh Post studio.
8:20—Music.
9:00—An address by Rev. Dr. Alexander Mann of Boston, bishop-elect of the Episcopal diocese of Pittsburgh, from The Pittsburgh Post studio.
9:10—Music.
9:55—Arlington time signals.
Concert by University of Pittsburgh Musical Clubs.
T. Earle Yearsly, director Glee Club.
George R. McNemar, director Mandolin Club.
Phyllis L. Newlands, reader.
Mandolin Club—
Danse Orientale .....G. Lubomirsky
Serenade Espagnole ....Georges Bizet
Glee Club—
When Good Fellows Get Together.
.....Frederick Field Bullard
A Wet Sheet and a Flowing Sea.
.....R. Kountz
Reading—
The Two Greetings..James W. Foley
Miss Phyllis L. Newlands.
Baritone solos—
The Old Road....John Prindle Scott
De Ole Ark's a-Moverin.....
.....David W. Guion
Gerton Kinney.
Mandolin Club—
L. Canne's Reverie—Extase....
.....Theodore M. Tobani
The Lonely Nest ....Victor Herbert
Glee Club—
Ole Uncle Moon.....Charles P. Scott
The Scissors-Grinder .....H. Jungst
Reading—
The Ship of Faith .....Anon.
Miss Newlands.
Bass solo—
Armour Song from Robin Hood.
W. H. Dickinson.
Glee Club—
Men of America.....
.....Welsh Air arr. by G. Bantock
Mammy's Lullaby.....
.....Abbie Norton Jamison
Mosquitoes .....Paul Bliss
Mandolin Club—
Who Cares? .....Milton Ager
Little Serenade .....Alfred Gruenfeld
Glee Club—
The Panther song (new). Text, Dr. Horrace Scott, '15; music, Dr. C. S. Harris, '16.
Alma Mater.
Music from 10 to 10:15 a. m., and from 12:30 to 1 p. m. The Westing-

CHICAGO RADIO AMERICAN

By William J. Clark, Chicago Evening American Radio Editor.

RADIO CONGRESS A SUCCESS; TO BE ANNUAL

The International Radio Congress, held in connection with the Pageant of Progress, is to be an annual affair, in accordance with resolutions adopted at the closing session yesterday, and promises made at a banquet given Dr. Charles P. Steinmetz and other radio experts by the Electric Club of Chicago at the Hotel Morrison last evening.

Maj. J. O. Mauborgne was elected president for another year on motion of Commissioner George E. Carlson of the department of gas and electricity, and empowered to appoint ways and means committee, and minor committees to prepare for next year's congress.

PROCEEDINGS IN BOOK FORM.

The proceedings are to be compiled into a book for general distribution in the interests of radio development.

"We have been extremely well satisfied with the result of our first congress," said Maj. Mauborgne today, "and we hope to make next year's congress even bigger and better."

[illegible] assemblage of radio and electrical experts ever met than attended last evening's banquet. Among them was Vice President Davis of the Westinghouse Electric and Manufacturing Company, known as "The Daddy of Broadcasting," the story of whom was told exclusively in The Chicago Evening American recently.

Although there was some serious discussion, the keynote was set by Dr. Steinmetz, when, he said:

AN EVENING OF NONSENSE.

"After two days of seriousness let us finish with an evening of nonsense," and he convulsed the gathering with fanciful pictures of what radio may accomplish, "when certain details have been worked out."

The talks of the men experts at the congress, however, were uniformly laden with scientific and mechanical developments for the future of the art of wireless transmission. One of the broadest plans being suggested by Maj. Mauborgne, when he said:

"I can predict with a great degree of certainty, that before long the broadcasting stations will serve all local communities in the United States. Programs, markets, etc., will be carried over the United States from a central station on long wave lengths, to be picked up by these local broadcasting stations, and relayed in the shorter wave lengths to the communities they serve."

The use of radio in directing and controlling machinery was outlined by Francis W. Dunmore of U. S. bureau of standards, who exhibited a recently perfected instrument for remote control by radio. By the use of this instrument, machinery at a distance from the central point can be stopped and started by the radio wave.

Father of Radio Broadcasting Tells of Problems

H. P. Davis Talks on Some Remedies Needed.

WANTS FANS TO MAKE CRITICISMS

H. P. Davis, vice president, Westinghouse Electric & Manufacturing Company, gave the first of a series of 15 radio talks on popular and technical radio problems at the Pittsburgh Post Studio KDKA. Mr. Davis' address follows:

"Friends of KDKA—In addressing you I like to speak to you in this relation:

"I presume I am talking to many thousands, of whom many have been listeners of KDKA for a long time; others, perhaps, who possibly are just beginning to take up this fascinating diversion and to get acquainted with us.

"Has it occured to you what a curious relation there is betwen us, and how little there is to let us know what the other thinks of us? The artist appearing before an audience is almost immediately aware of the success or failure of his effort; the theater manager has a barometer in his box office; the newspaper or the magazine can tell by its circulation to what extent it is meeting public appreciation. Public utility service companies can readily sense the public's attitude. But in this undertaking of ours—which in a way is also a public service—we have not yet found an effective means to sense the feelings of those who make use of KDKA's service.

Problems to Solve.

"Now, KDKA is anxious to change this situation and wishes in some way to obtain a closer touch with you. Besides, KDKA would like you to have a better understanding of radio matters in general and the problems that must be solved in an undertaking of this kind.

"With a full appreciation of the situation and realizing the serious nature of the difficulties now confronting broadcasting, I am giving this talk as a sort of opening chapter of a series of talks which will follow at short intervals from this station, on the various phases of radio broadcasting transmission and reception, and it is hoped to cover every angle of the subject.

"These talks will be given by some of the foremost radio engineers and broadcasting program managers.

"The broadcasting problems really divide itself into three major divisions, the first of which is that of regulation.

"When KDKA started to broadcast it was the only broadcasting station in existence. It offered a service entirely new and of a most fascinating and mysterious character. It, therefore, had no difficulties with interference, nor did it have to meet any criticism from its comparatively small audience.

"During the period of somewhat over two years that KDKA has been operating, however, this situation has changed materially. Receiving stations have been established at an almost inconceivable rate, so that now they number in the millions, and radio service has become actually a public necessity.

600 Broadcasting.

"Unfortunately, however, this growth is not confined to the receiving or listening public, but the number of broadcasting stations also has increased by leaps and bounds until now there are in the neighborhood of 600 broadcasting stations, all bunched on two wave lengths.

"This huge but miscellaneous bunch of broadcasters and listeners is now confronted with a condition of chaos. There is no existing or proposed plan [illegible] this chaotic condition or to be changed from week to week.

"These stations should operate on wave lengths that night so that they would not interfere with each other, and selection and regulation of the stations and allotment of wave bands would have to be done from Washington.

"In addition to the selection of the stations, the hours which each station would broadcast also should be arranged so that they would not conflict—thus giving the listeners for that evening opportunity to listen to the broadcasting of each station separately.

Mr. Davis, vice president of the Westinghouse Electric and Manufacturing Company, nationally known as the "Father of Radio Broadcasting."

available for transmitting and receiving, this limits the number of broadcasting stations that can operate without interference to a relatively small number at widely separated points.

"The radio engineers, therefore, have the problem of devising apparatus for transmitting that will permit sharper tuning and thus allow more broadcasting stations; and, similarly, receiving apparatus that will be more selective to allow a desired station to be tuned in without interference from other stations that may be broadcasting at the same time. This is possible, and in due course much will be accomplished along these lines.

Much to Be Done.

"To make the programs interesting speech and music must be so transmitted and received as to allow the listener to receive the true tone qualities. A good deal has been accomplished in two years in this respect, but a great deal is still left to be done.

"These problems are being worked upon with intense activity in the research laboratories of the large electrical organizations, for the problem is essentially is electrical, and by those organizations, and by them only, is the solution possible. None of this development work is possible by other organizations not so situated. Please do not forget this.

"I have not said anything about the cost of broadcasting. There has been much said about this, however, and a great deal of worry has existed as to the permanency of broadcasting because of the lack of revenue to those who are doing the broadcasting.

"Personally, I believe this is one of the least of the worries you should indulge in. Rather than worry about the expense to those who are broadcasting, you should be more concerned about the confusion to which I have referred, and the failure of the authorities to show inclination to correct it, which is discouraging to those who have development, quality and service in mind. Results along these lines are impossible to obtain under conditions as they exist at the present time.

"I believe the solution is in your hands, and in yours only. This situation will be rescued only when you—the great public—take organized action to bring your wishes before those who make the laws, and to the attention of those who are doing the broadcasting.

"I thank you."

way to restrict the number of stations broadcasting if there is to be any hope of enjoying non-interfering reception, so essential to worth-while broadcasting.

"Further, there must be supervision and regulation that will require both quality and service of the broadcasting stations.

"In the range of wave bands alloted by the Government for broadcasting, there are comparatively few available for that purpose and even if all of them were made use of it would not permit more than 30 or 40 stations throughout the country, and location and wave length would have to be carefully allotted and adhered to, to permit these to operate at the same time without interference.

"The problem of accomplishing this with 600 or more stations now operating, and possibly as many more starting in the near future, will make it plain for you to see that the situation is out of control.

"Pending such time as there is proper organization and proper federal regulation to remedy this situation, there have been many suggestions made to improve existing conditions, and the one which has most frequently appeared and has been the most often urged is that of a silent night to permit of long distance reception.

Plan Is Difficult.

"Have you realized how difficult this will be? Suppose that in the Pittsburgh territory all the stations closed for one night to allow local listeners to receive distant programs. In the selection of the nights it would of course be out of the question to select nights in advance when reception conditions would be favorable.

"Next, if all the rest of the world were operating, even though the local stations were closed, the interference still would be controlled and satisfactory reception would be very uncertain.

"It appears that the better suggestion would be to have one night a week in which a few selected stations properly picked throughout the country would operate, and these only. This selection of stations, of course, could be on interfering wave lengths would closed that night.

"If this arrangement were possible, it would give the listening public an opportunity to compare these various stations. In my opinion, it would lead to the solution of some of these problems, thus testing the desirability of limiting the number of stations permitted to broadcast, and of selecting those most capable for such service.

Program Quality.

"But the problem is not merely one for the legislators, although their problem is one that we must all support and urge to the end of organized regulation and limitation of the stations that are permitted to broadcast. In a later talk this phase of the problem will be discussed at length and suggestions made as to how you can exert your influence to bring this about.

"The second division of our problem is that of program quality and development.

"Now, in the matter of programs, we all are vitally interested. Have you ever thought what a task it is to provide a daily program, hours in length, seven days in a week, each of which will be pleasant and satisfactory? Especially when it is recognized that the service given is gratuitous by those who appear on these programs?

"KDKA is especially anxious to give programs that are pleasing to the larger number of its listeners. We ask your co-operation. This co-operation can be given by suggestions, and by encouragement to the artists who appear. A small effort on your part may mean a great deal in our success, and words of praise to the performers will make our task easier in stimulating the desire of performers to appear.

"Nothing discourages an artist so much as a cold audience, and I think we must admit that there is nothing colder than a radio audience unless we will each of us recognize that we have a duty that exists beyond the mere listening to the programs.

"There are hundreds of thousands—yes, millions—of listeners to the nightly programs of the broadcasting stations. At the present time this is a gratuitous service, and as far as I personally can see it is likely to remain so always.

Asks for Criticism.

"But even recognizing this, what is the attitude of the listeners? Are you always to remain passive and take what is offered by the broadcasting stations, or will some way be found to correct this?

"I appeal to you, therefore, for help. Write to KDKA, KYW, WJZ or WBZ, whichever is nearest to you—all stations of the Westinghouse Electric and Manufacturing Company—and give criticisms or suggestions. Thousands have done this, but the number is only a small fraction of the vast unknown and unseen audience. We promise you our best efforts to follow the will of the majority if you will respond.

"The third division of our problem belongs to the radio engineer.

"I want you to realize that this service of radio broadcasting is only a little more than two years old. Obviously, with so young an undertaking, much as to be done in the way of improvement and development, which is bound to occur if those who have the ability, means and facilities to accomplish it are encouraged and permitted to do so.

"There are only a relatively few individuals and organizations so situated that they can accomplish this necessary and desirable end. This work must be done by those who can do broadcasting and who can make the receiving apparatus.

"I already have indicated how few wave bands are available in the limits permitted by the Government for broadcasting. With the apparatus now

graduated from the Worcester Polytechnic Institute with the degree of B. S. in electrical engineering in 1890, and after a trip to Europe and a few months spent with the Thompson-Houston company, entered the engineering department of the detail engineering department in 1891. In 1896 he was placed in charge of this department; in 1908 he was made manager of the engineering department. This position he held until 1911, when he was elected vice president.

New York City Mail
Dec. 30, 1922

"Crystal" Gazing Into 1923 With an Expert

An Interview With H. P. Davis

NATIONAL regulation of radio broadcasting, programme quality and perfection of apparatus, are the three big steps which must be taken in 1923, according to H. P. Davis, vice-president of the Westinghouse Electric and Manufacturing Company, and "Father of Radio Broadcasting."

Mr. Davis, speaking of the outlook during the coming year, said recently:

Friends of Radio—In addressing you I like to speak to you in this relation.

Has it occurred to you what a curious relation there is between us, and how little there is to let us know what the other thinks of us? The artist appearing before an audience is almost immediately aware of the success or failure of his effort; the theatre manager has a barometer in his box office; the newspaper or the magazine can tell by its circulation to what extent it is meeting public appreciation. Public utility service companies can readily sense the public's attitude. But in this undertaking of ours—which in a way is also a public service—we have not yet found an effective means to sense the feelings of those who make use of broadcasting service.

Public Should Speak.

Now, we are anxious to change this situation and wish in some way to obtain a closer touch with you. Besides, we would like you to have a better understanding of radio matters in general and the problems that must be solved in an undertaking of this kind.

The broadcasting problem really divides itself into three major divisions, the first of which is that of regulation.

When station KDKA started to broadcast it was the only broadcasting station in existence. If offered a service entirely new and of a most fascinating and mysterious character. It therefore had no difficulties with interference, nor did it have to meet any criticism from its comparatively small audience.

During the period of somewhat over two years that this station has been operating, however, this situation has materially changed. Receiving stations have been established at an almost inconceivable rate, so that now they number in the millions, and radio service actually has become a public necessity.

Unfortunately, however, this growth is not confined to the receiving or listening public. The number of broadcasting stations also has increased by leaps and bounds until now there are in the neighborhood of 600 broadcasting stations, all bunched on two wave lengths.

Chaotic Condition.

This huge but miscellaneous bunch of broadcasters and listeners is now confronted with a condition of chaos. There is no existing or proposed plan to correct this chaotic condition or to prevent interference. Action must soon be taken in some way to restrict the number of stations broadcasting if there is to be any hope of enjoying non-interfering reception, so essential to worthwhile broadcasting.

Further, there must be supervision and regulation that will require both quality and service of the broadcasting stations.

In the range of wave bands allotted by the government for broadcasting, there are comparatively few available for that purpose, and even if all of them were made use of it would not permit more than thirty or forty stations throughout the country, and location and wave length would have to be very carefully allotted and adhered to to permit there to operate at the same time without interference.

The problem of accomplishing this with six hundred or more stations now operating, and possibly as many more starting in the near future, will make it plain for you to see that the situation is out of control.

Pending such time as there is proper organization and proper federal regulation to remedy this situation, there have been many suggestions made to improve existing conditions, and the one which has most frequently appeared and has been the most often urged is that of a silent night to permit of long-distance reception.

Have you realized how difficult this will be? Suppose that in the Pittsburg territory all the stations closed for one night to allow local listeners to receive distant programmes. In the selection of the nights it would of course be out of the question to select nights in advance when reception conditions would be favorable.

Next, if all the rest of the world were operating, even though the local stations were closed, the interference would still be uncontrolled and satisfactory reception would be very uncertain.

It appears that the better suggestion would be to have one night a week in which a few selected stations properly picked throughout the country would operate, and these only. This selection of stations, of course, could be changed from week to week.

If this arrangement were possible it would give the listening public an opportunity to compare these various stations. In my opinion it would lead to the solution of some of these problems, thus testing the desirability of limiting the number of stations permitted to broadcast and of selecting those most capable for such service.

The second division of our problem is that of programme quality and development.

Now in the matter of programmes we are all vitally interested. Have you ever thought what a task it is to provide a daily programme, hours in length, seven days in the week, each of which will be pleasing and satisfactory, especially when it is recognized that the service given is gratuitous by those who appear in these programmes?

Nothing discourages an artist so much as a cold audience, and I think we must all admit that there is nothing colder than a radio audience unless we will each of us recognize that we have a duty that exists beyond the mere listening to the programmes.

There are hundreds of thousands—yes, millions—of listeners to the nightly programmes of the broadcasting stations. At the present time this is a gratuitous service, and as far as I can personally see it is likely to always remain so.

But even recognizing this, what is the attitude of the listeners? Are you always to remain passive and take what is offered by the broadcasting stations, or will some way be found to correct this?

Free Service to Remain.

I appeal to you, therefore, for help. Write to whichever station is nearest you and give criticisms or suggestions.

The third division of our problem belongs to the radio engineer.

I want you to realize that this service of radio broadcasting is only a little over two years old. Obviously with so young an undertaking much has to be done in the way of improvement and development, which is bound to occur if those who have the ability, means and facilities to accomplish it are encouraged and permitted to do so.

There are only a relatively few individuals and organizations so situated that they can accomplish this necessary and desirable end.

I have already indicated how few wave bands are available in the limits permitted by the government for broadcasting. With the apparatus now available for transmitting and receiving, this limits the number of broadcasting stations that can operate without interference to a relatively small number of widely separated points.

Need Better Apparatus.

The radio engineers, therefore, have the problem of devising apparatus for transmitting that will permit sharper tuning and thus allow more broadcasting stations, and similarly receiving apparatus that will be more selective to allow a desired station to be tuned in without interference from other stations that may be broadcasting at the same time. This is possible, and in due course much will be accomplished along these lines.

To make the programme interesting, speech and music must be so transmitted and received as to allow the listener to receive the true tone qualities. A good deal has been accomplished in two years in this respect, but a great deal is still left to be done.

These problems are being worked upon with intense activity in the research laboratories of the large electrical organizations, for the problem is essentially electrical, and by those organizations, and by them only, is the solution possible. None of this development work is possible by other organizations not so situated. Please do not forget this.

I have not said anything about the cost of broadcasting. There has been much said about this, however, and a great deal of worry has existed as to the permanency of broadcasting because of the lack of revenue to those who are doing the broadcasting.

Personally I believe this is one of the least of the worries you should indulge in. Rather than worry about the expense to those who are broadcasting, you should be more concerned about the confusion to which I have referred, and the failure of the authorities to show inclination to correct it, which is discouraging to those who have development, quality and service in mind. Results along these lines are impossible to obtain under conditions as they exist at the present time.

I believe the solution is in your hands, and in yours only. This situation will be rescued only when you—the great public—take organized action to bring your wishes before those who make the laws and to the attention of those who are doing the broadcasting.

What H. P. Davis Predicts for Us During 1923

Action must soon be taken in some way to restrict the number of stations broadcasting if there is to be any hope of enjoying noninterfering reception, so essential to worthwhile broadcasting.

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About the cost of broadcasting. There has been much said about this, however, and a great deal of worry has existed as to the permanency of broadcasting because of the lack of revenue to those who are doing the broadcasting.

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I believe the solution is in your hands, and in yours only. This situation will be rescued only when you—the great public—take organized action to bring your wishes before those who make the laws and to the attention of those who are doing the broadcasting.

C O P Y.

January 9, 1924.

Mr. E. M. Herr,
President.

As you know, for the last two years I have been urging a plan of broadcasting which, as events develop, indicates one that offers the greatest possibilities for national and even world-wide broadcasting and reception.

This has been discussed by correspondence and also verbally with Dr. Goldsmith and Mr. Sarnoff, and many others in our own organization, and there is considerable correspondence in my files about it.

This plan proposes the following -

First - The establishment of a relatively few high power primary broadcasting stations; these stations to be located in centers where the best of program material is available, as for instance, San Francisco, Chicago, New York in this country; London in England; Paris, Berlin and Vienna in Europe; and similar suitable places in Asia, Japan and possibly Australia, South Africa and South America; each of these primary broadcasting stations to have an exclusive wave band, for its individual use, to permit encircling the globe if thought desirable, without interference.

These stations will have facilities to send program material out not only at a wave audible for receiving sets, but also on another wave inaudible to receiving sets; this latter to be a high power frequency wave similar to that now being used by KDKA and KFKX.

Second - Scattered at suitable locations throughout the world there should be high power repeating stations whose purpose will be simply to relay or repeat the programs being broadcast by the primary broadcasting stations on the high frequency wave, with, if required, facilities to make a world circuit.

Third - An unlimited number of low power secondary, or local, broadcasting stations, using waves audible for receiving sets, with the power so restricted as to be non-interfering between themselves or with the repeating stations. These stations will select the material they desire from one of the primary broadcasting

stations' repeating wave, for their main programs, and, as desirable, use the stations between times for the broadcasting of local material.

This is a very brief statement of the plan, but I think it is sufficient to give an idea of what is proposed and what its possibilities and scope are. Such a plan will make world events available to everyone at widely different points and on different continents.

This plan when first proposed was somewhat nebulous, but is no longer so as it has been demonstrated beyond doubt that a scheme of this kind is wholly feasible, and I feel that it is now time to think seriously about it and to consider undertaking it on a commercial basis by the formation of an international company to undertake to organize and promote this plan.

It will be necessary for such a company to have exclusive rights to these restricted wave bands in order to furnish the programs at the primary stations, and to maintain the repeating stations and the high quality service necessary. This company must control the service and be able to make arrangements with the secondary stations for leasing receiving and rebroadcasting sets which would carry the rebroadcasting or repeating rights from the primary stations. This service will give a source of revenue to the company which will allow profitable operation and permit expenditures of considerable sums of money for talent at the primary stations.

I am satisfied that if such a company can be set up, monopolistic as it must be, it would be one of the greatest benefits to mankind ever promoted, if properly administered, and in addition

be a profitable enterprise, as it must be to endure and be successful.

A great deal of work is necessary, I realize, but if something of the kind is to be undertaken it should be attempted early before rights are given away that would prevent the carrying out of a comprehensive scheme of this kind.

I am so impressed with the possibilities of an organization of the kind and the practicability of the plan that I have felt it should be made the basis of a letter to you, as the Westinghouse Company to date has taken all the forward steps in this development and has proven out these theories by actual demonstration at very considerable expense in research and experimental work. I do not mean to give the impression, however, that development work is finished; in fact, it is quite the reverse - the ground is not even scratched, and much is to be done which can, I feel, only be accomplished successfully under some such organization as I am proposing.

(Signed) H. P. Davis,

Vice President.

(Copy to Mr. E. M. Herr)

MEMORANDUM.

February 18, 1924.

PLAN PROPOSED BY H.P.D. FOR ORGANIZED BROADCASTING.

This plan was discussed with Mr. Herr on February 6th, 1924. Assuming that it would be possible for an organization to be licensed to use copyrighted music and to collect revenue for broadcasting, it would be possible with the patent situation now existing to establish a few primary broadcasting stations whose programs could be repeated to secondary stations in the manner previously proposed by H.P.D. These primary stations, having an exclusive license under copyrights of the best authors, composers and publishers, could then use sufficient of this material in their programs so that only licensed secondary stations could make use of this service.

This would be the only real way to keep out unlicensed repeating, and would be similar to the methods now in vogue with the Associated Press.

By licensing these secondary stations to use the repeated programs, a very considerable revenue would result which could be used for paying the license fees for the copyrights, support the organization and the primary and repeating broadcasting stations, and leave a large sum available for paying for talent.

Such a plan, if possible would immediately put broadcasting on an organized and paying basis, with a permanent future, and with proper administration would offer such superior service that any other attempt would be futile, and would leave the field practically free for this organization and its licensees to do the broadcasting of the country, if not the entire world.

Success April 1924

Who Says: "There's No Room at the Top"?

THE FATHER OF RADIO BROADCASTING

Harry Phillips, Vice-president in charge of Manufacturing and Engineering, is shown delivering the New Year's Address which was heard all over Europe

Nor is this true of just one man in the Vestinghouse concern.

Take vice-president Harry Phillips Davis or instance: Mr. Davis has many claims o glory and fame in the electrical field but ie probably will make his greatest appeal o the public as the man who opened the irst radiophone broadcasting station in he world, KDKA. It was he who conceived the idea that the radiophone broadcasting lent itself not only to private communication, but that it had a universal field of usefulness.

Through it one could communicate to hundreds, thousands or millions, all in fact, who had the suitable "ear." He decided to build a large station and make radio broadcasting a public service. KDKA was opened in November, 1920. Today there are over five hundred broadcasting stations in the United States.

Davis was one of the best equipped men n the electrical industry to take up the difficult problems of broadcasting. He has been a leader in the electrical industry since his college days. Nearly a hundred patents covering electrical apparatus have been issued to him. He is an engineering genius and is known, not only as a designing engineer of high rank, but also as a man who gets things done.

His ability to accomplish results rapidly has already been proved in the history of his company's broadcasting achievements.

Mr. Davis is a New Hampshire product. He graduated from the Worcester Polytechnic Institute with the degree of B.S. in electrical engineering and a year later entered the Westinghouse company in 1891 as shop engineer in the detail engineering department. He became head of his department and two years later was made manager of the engineering department. This position he held until he was elected vice-president in 1911.

Twenty years to make the grade! What's youth's answer to this?

New York Times
April 10, 1924

Yesterday's Invention Revolutionized.

It is not for the uninitiate in electrical mysteries to understand what Vice President H. P. DAVIS of the Westinghouse Company had to say, the other day, about "radio repeating" and the short wave length, which he called "inaudible" in contrast with those that can be heard by means of the receiving sets now in common use. His authority is sufficient, however, to make it quite safe to accept his assurance that before long, by means of specially constructed broadcasting stations, judiciously distributed among the world's cities, any one of their inhabitants can be put in direct communication with any other.

That is not so far from being the situation, even now, but, according to Mr. DAVIS, "radio repeating" has begun a real revolution in the utilization of a facility which still is so new that it might have been expected to remain as it is for a while at least. This revolution, he declares, unlike some others, is to result in changes for the better, including the abolition, to a considerable extent, of both the fact and the possibility of the interference of broadcasters with each other, which at present is often so annoying and not infrequently prevents all intelligible communication.

Whatever the improvement, however, the public will refuse to be astonished or even surprised. It has been so familiarized with miracles in these latter s that it takes them all, as they follan quick succession, as matters of it and has become so nearly cer-

High Tribute Paid to Local Men Who Had Vision to Be Pioneers.

Crediting The Pittsburgh Post-Westinghouse broadcasting station, KDKA, Pittsburgh, as the most efficient and finest in the world, Major General James G. Harbord, former assistant chief of staff of the United States Army and president of the Radio Corporation of America, paid high tribute to those men of vision who were pioneers in broadcasting work in this city.

"Within a year we will have radio pictures," General Harbord prophesied, "when it will be possible to see the person with whom we are talking by radio telephony at long distances, and within the year we will have ocean telephony, when it will be possible to talk with those on the other side of the ocean.

FUTURE YET UNSEEN.

"But the future of radio," added General Harbord, "is impossible to foresee. There are half a million users of radio, there are 3,000 manufacturers, 20,000 retail dealers, in America, an annual expenditure for radio equipment of $175,000,000, and 563 broadcasting stations. Of these 565 stations there is none better than the Westinghouse KDKA station here in Pittsburgh, and you should be proud, you Pittsburghers, that you have such men of vision and ability as E. M. Herr, H. P. Davis and Guy E. Tripp. What these pioneers have done for radio broadcasting can never be measured.

Pgh Gazette
June 12, 1924,

18

WESTINGHOUSE ISSUE APPROVED

Stock to Be Increased From $125,000,000 to $200,000,000.

DIRECTORS ELECTED

A proposed increase in the authorized capital stock of the Westinghouse Electric and Manufacturing Company from $125,000,000 to $200,000,000 was approved yesterday at the annual meeting of the stockholders of the company, held in the main offices at East Pittsburgh.

Directors, as follows, were elected by the stockholders:

Of the class whose term will expire the second Wednesday of June, 1928—Guy E. Tripp, chairman of the board, Westinghouse Electric and Manufacturing Company; H. H. Westinghouse, chairman of the board, Westinghouse Air Brake Company; Joseph W. Marsh, president, the Standard Underground Cable Company; Albert H. Wiggin, president, Chase National Bank of New York.

Of the class whose term will expire the second Wednesday of June, 1925—H. P. Davis, vice president, the Westinghouse Electric and Manufacturing Company.

Of the class whose term will expire the second Wednesday of June, 1927—L. A. Osborne, vice president, the Westinghouse Electric and Manufacturing Company.

Two Directors Retire.

Mr. Osborne and Mr. Davis are new directors elected to fill vacancies created by the retiring of James C. Bennett and William H. Woodin.

The new directors are well known through their activities in the electrical industry. Mr. Davis is probably best known for his work in starting and maintaining the interest of the public in radio broadcasting through the establishing of KDKA, world's pioneer broadcaster, and other radio stations operated by his company.

Mr. Osborne's most recent achievement, co-operating with Mr. Tripp, was the consummation of a manufacturing agreement between his company and the Mitsubishi Electric and Engineering Company of Japan, by means of which American design of electrical apparatus was given a decided impetus in the Far East.

At the meeting E. M. Herr, president, made the following statement:

The condition of business in our industry is quite satisfactory, especially considering the tendency of business in general to slow up at the present time. While our business also is somewhat less than for the corresponding period a year ago, the decrease has not been of sufficient volume to materially affect our operations and our commercial people believe that it will improve in the fall.

NEW DIRECTORS

L. A. Orborne.
H. P. Davis.

PARTY CAMPAIGNS PROMOTED BY RADIO

Unprecedented Vote in Fall Predicted, Due to Broadcasting of Conventions.

Special Dispatch to The Star.

PITTSBURGH, July 8.—"Broadcasting the proceedings of the great national conventions of the Republican and Democratic parties has aroused such national interest that the greatest poll of votes ever cast at a presidential election will result," according to Vice President H. P. Davis of the Westinghouse Electric and Manufacturing Company.

Mr. Davis, internationally known as the "father of broadcasting," has had an opportunity to study closely the reaction of the public to the broadcasting of the convention proceedings, because three of the four stations operated by the Westinghouse electric broadcast the proceedings of both conventions. These stations were KDKA, the world's pioneer, at East Pittsburgh, Pa.; the repeating station KFKX, located at Hastings, Neb., and station WBZ, at Springfield, Mass. "The natural result of broadcasting the 'keynote' and nominating speeches, the cheers of the delegates and their songs, the casting of the votes and the final selection of the candidates is to excite the interest of the people in the forthcoming presidential race," continued Mr. Davis.

Notes Natural Result.

"Having had their interest piqued by their intimate association with the details of the nominating conventions, it is but natural to expect the voters to go to the polls in great numbers next November.

"The reaction of the public to the convention proceedings evidently was not taken into account by the political managers, else there would have been less of the wild, tumultuous shouting and mob scenes of the delegates and a more businesslike assembly, which the public quite naturally believed these conventions to be. It cannot be doubted that the schoolboy enthusiasm of the delegates was not quite in keeping with so solemn an occasion as selecting a future candidate for the President's chair."

"There is another aspect to the broadcasting that few have foreseen. Because KDKA broadcast the proceedings of the conventions, which broadcasts were repeated by KFKX and WBZ, people living far beyond the borders of the United States heard all the details of the assemblies. The people of Canada, Mexico, South and Central America, through their radio sets could tune in at any time and hear the delegates. During the broadcasting two cablegrams were received from listeners in Argentina, who heard KDKA short waves. The wild scenes at the conventions, particularly the Democratic assembly, could not have given these foreigners the correct impression of our great republic's method of choosing a President.

Useful to Party Managers.

"The political managers will surely keep radio broadcasting in mind in future conventions and perhaps have the spokesmen present their cases in a clear and concise manner as though they were talking to the public as well as to the delegates.

"Radio, which brings only sound, without the action, and which makes it impossible to bring about emotional "mob effects" will probably eliminate this disorder in the future, as it will also bring a greater number of people to the polls.

"These two outstanding changes that radio broadcasting probably will make in the convention proceedings and in the poll of votes more than justify its use politically."

It is interesting to recall in connection with the enthusiastic interest of the people in the broadcasting of these convention returns that four years ago, November, 1920, KDKA broadcast the first political news to go on the air. This event was the

Introductory Remarks by Mr. L. H. Burnett, at banquet of Iron and Steel Electrical Engineers, William Penn Hotel, September 1924.

FOURTH SPEAKER:

K. D. K. A. now tuning in. Next speaker is among those actively directing the progress of the electrical industry today.

Born in New Hampshire. Impossible to keep a real Yankee down. Graduate of Wooster Polytechnic Institute. He is responsible for the radio telephone L.& G. that is some responsibility. How would you like to be responsible for all the bed time stories and alleged music that we hear over the radio.

Talk about isolation of poor farmers. It isn't so. He can tell you what the price of cabbage will be day after tomorrow; all about the latest Paris styles and how long bathing suits must be to "get by" at Atlantic City. He is better informed than the city man, because he has little interference from "static". Just returned from the wilderness. Radio nut. Heard everything from bed time stories to midnight frolics. One broadcaster in Chicago talked to his "fans" in song. Zep - I'm going to sing it.

How do you do Mr. Davis: How do you do?
" " " " " " How are you:
We are ready now to hear you
To greet you and to cheer you
How do you do Mr. Davis: It's up to you
It is my privilege to introduce Mr. Harry Phillips Davis,
Vice President of Westinghouse Electric & Mfg. Co.

G4:21
Box 3
FF 36

Scrapbook 1921-1922

Davis, H. P. 1868-1931. Papers 1915-1949

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SEPTEMBER 6, 1924

Broadcasting for Votes

AUTOMOBILES, the movies, radio, and other diverting instruments of the existing civilization have been blamed by some diagnosticians of nonvoting for this disturbing tendency in our democracy. What seems to be a sounder view is that taken by H. P. Davis, widely known as the father of broadcasting, and who is vice president of the Westinghouse Electric and Manufacturing Company.

"Radio," predicted Mr. Davis recently, "will bring a greater number of people to the polls. The natural result of broadcasting the keynote and nominating speeches from the conventions, the cheers of the delegates and their songs, the casting of the votes and the final selection of the candidates, is to excite the interest of the people in the forthcoming Presidential race. Having had their interest piqued by their intimate association with the details of the nominating conventions, it is but natural to expect the voters to go to the polls in great numbers next November."

Mr. Davis has logic on his side. Radio should be one of the most valuable instruments of those patriots of peace who devote themselves to the task of getting out the vote. If the dry farmer out in Idaho picks up WCAP some night when his crop is under cover and hears the President of the United States make a nonpartisan appeal to him to vote, why, then it is likely that he will vote when the time comes. The thing has been brought home to him. And if he has an automobile that will take him to the polls and back in two hours where a team of mules would require ten hours, it is more than likely. The pressure of farm work and the distance separating farmhouses from country polling places account for the fact that the country vote is harder to get to the polls than the city vote. The automobile, plus the call of the radio, should do more than even the score.

As for the motion picture, a Griffith could prepare a movie that would dramatize the perils that threaten our nation from nonvoting so sharply as to reform every slacker citizen who saw it.

Instead of diverting the voters from their obligation, the radio, the automobile, and the movie should be most effective aids to making this The Year of the Big Vote.

HOOVER SUGGESTS NATIONAL SYSTEM OF RADIO PROGRAMS

Secretary Advocates Broadcasters' Organization to Give Service Much as Press Associations Do for Newspapers, In His Speech Before Wireless Conference.

[By Associated Press to The Gazette Times.]

WASHINGTON, Oct. 6.—Organization of a national system of radio programs through a broadcasters' association to give service much as press associations do for newspapers was suggested by Secretary Hoover tonight in an address opening the third national radio conference.

The conference is attended by representatives of all branches of the industry and was called by Mr. Hoover to consider the numerous problems of radio development in the United States. Beginning tomorrow morning the general sessions will be open to the public for presentation of any problem involving the industry.

The addresses tonight were broadcast through a system of 16 radio stations.

Opposes Air Monopoly.

In presenting his views tonight, Secretary Hoover reiterated his opposition to any attempt to monopolize the air, declaring that local broadcasting stations are of first importance and must not be driven from the field.

The Secretary's suggested plan for a national program association would provide for a self-sustaining system of interconnection of radio broadcasting stations, and the offering through those stations of the best the nation has in music and entertainment.

Mr. Hoover said in part:

My proposition is that the local stations must be able to bring to its listeners every important national event with regularity. The local station must be able to bring its listeners the greatest music and entertainment of the nation, but far beyond this it must be able to deliver important pronouncements of public men, it must bring instantly to our people a hundred and one matters of national interest. To this, it must add matters of local interest. This can only be accomplished by regularly organized interconnection on a national basis with nationally organized and directed programs for some part of the day in supplement to more local material

Praises Pioneers.

It may be stated with assurance that the greatest advance in radio since our last conference is the complete demonstration of the feasibility of interconnection. We owe a debt of gratitude to those who have blazed the way. The pioneers have been the American Telephone and Telegraph Company in wire interconnection and the Westinghouse Electric and Manufacturing Company in radio interconnection through the use of short wave lengths.

It is our duty to consider the possibility of interconnection as a regular daily routine of the nation. Unless it be systematically organized we cannot expect its continuation. I realize that this matter, except insofar as it may be fostered and encouraged, does not lie in the government. It would be unfortunate indeed if such an important function as the distribution of information should ever fall into the hands of the government. It would be still more unfortunate if its control should come under the arbitrary power of any person or group of persons. It is inconceivable that such a situation could be allowed to exist.

But I am not dealing with a monopoly. Nor is this a question which any one lays claim to a monopoly. Interconnection is going on to a large extent and over the wires of the telegraph companies, the telephone companies, and by radio itself. We have promises of super radio and we have promises of interconnection by wired wireless. If there are several methods, it means that we may have several alternative programs always available. But whatever the method of interconnection may be, we are lacking a definite organization on a national system of programs and a basis of support.

Would Not Allow Advertising.

I believe that the quickest way to kill broadcasting would be to use it for direct advertising. The reader of the newspapers has an option whether he will read an ad or not, but every speech by the President is to be sandwiched in as the meat in a sandwich of patent medicine advertisements, there will be no radio left. To what extent it may be employed for what we may call indirect advertising I do not yet know and only experience, with the reactions of the listeners can tell.

I do not believe there is any practical methods of payment, from the receivers. I wish to suggest for consideration the possibility of mutual organization by broadcasters of the service for themselves similar to that which the newspapers have for their use in the press associations, which would furnish programs of national events and arrange for their transmission and distribution on some sort of a financial basis just as the press associations gather and distribute news among their members.

Yellow #4

Yellow #4

.H Credit Card - ctw/m
Per

Radio Now Billion Dollar Business

(Continued From Page 31)

Just a little interesting incident in this connection is that the speaker was the one to get the first pictures before this station was officially opened on the third of July, 1923.

Some day perhaps there will be other stations connected by wire which can get the benefit of these wonderful programs. Would this interest you?

The next important element in the broadcasting field is the great organization known as The General Electric Company with their home office at Schenectady, N. Y. They told us they are erecting another station at San Francisco, which will soon be ready.

I cannot take time, as I would like to do, to have you meet the splendid men connected with this great and capable organization—but some time later perhaps.

Now we must go on to get acquainted with another very big house in this big industry—the Westinghouse Electric and Manufacturing Company, with their home office in East Pittsburgh, Pa., where is located Station KDKA, with two other very capable stations at Springfield, Mass., and Chicago, Ill.

Now the fourth element in this headliner broadcasting is the Radio Corporation of America, with two stations in New York City and one in Washington, D. C., of which latter station the speaker also had the privilege of getting the first photographs, not only of the station, but of the personnel as well. We must pass briefly over this, as well as some of the other big stations, but hope that at some future time we will have opportunity to treat them more fully.

At Medford Hillside, Mass., is the station of the American Radio and Research Corporation.

On the top of the 1100-room Hotel Statler in Buffalo is the very fine station of the Federal Telephone and Telegraph Company.

In Cleveland on the top floor of one of the most beautiful buildings in America, which is owned by the Union Trust Company of Cleveland, with its $300,000,000 resources, is another very fine station.

The Detroit News, of Detroit, in its new building of beautiful architecture, has a station which is both large and exceedingly well managed, and a station also in which the men are full of great hopes and plans for the benefit of "listeners-in."

If you could only visit that exquisite Palm Room lobby of the Drake Hotel in Chicago, and its broadcasting station, if you could only look up and down the shores of Lake Michigan from the exquisitely designed Edgewater Beach Hotel in Chicago; if you could only visit with me St. Louis, Cincinnati, Denver and Kansas City; if you could have attended in Toronto the assemblage of that chorus of 2300 voices, then you could perhaps get some idea of the expenditure of thought and money to give pleasure to you and me.

There are 5,000,000 sets now owned in America, which leaves close to 20,000,000 sets yet to be sold.

We all know that just the lure of distance is not all we want; we want quality. In the very near future, although we have been receiving wonderful concerts, the programs will be still more wonderful.

In the beginning of this talk, I briefly summed up how I got into the radio game, but I was not specific. The man who is mainly responsible for me is your own dear friend, "Dream Daddy," Mr. Harry Erhart, who enthralled me with his voice and [illegible] as he has done to and parents. And through him I met Henry M. Neely. And because Mr. Neely wanted to be right before he went ahead this investigation of mine has been made.

Some day perhaps you can visit with me, in addition to the men I have mentioned, others connected with the American Telephone and Telegraph Company: Mr. Harkness, that pleasant personality around whom is written Capability, who is in charge of broadcasting; Mr. Ellsworth, in charge of publicity, whose dignified personality spells reliability; Mr. McClellan, an exceedingly live wire, and Mr. Felix, assistant in charge of publicity.

In the General Electric Company I would like you to shake hands with Mr. Swope, the president; Messrs. Gale, Rice, Davis and Lange, in charge of various important departments.

In the Westinghouse crowd I would like you to meet at least Mr. Conrad, the fundamental reason for this great company going into broadcasting; also Mr. Brackett and Mr. Chubb, Mr. McQuiston, Mr. Rogers and magnetic Mr. Davis, vice president, who has been the broadcasting inspiration.

In the Radio Corporation of America you would get an entirely different viewpoint on radio if you could meet Mr. Young, General Harbord, Mr. Sarnoff and Mr. Bucher.

And then, while not so popular, there are two or three other very vital and interesting figures in the radio field at the present time. Two of these are Philadelphia men each approaching the radio situation from a different angle. Mr. A. U. Howard, who resides in Chestnut Hill, is vice president of the Dubilier Condenser and Radio Corporation, and he has given the writer a total of fifteen hours to discuss radio from the public angle.

Mr. Walter Eckart, of the General Radio Corporation, approaches radio from the music and beauty side.

Mr. Furness, of the National Carbon, is telling his story in color, during the next four months, in one of our national periodicals.

Thus we have the big element in radio, men, creative geniuses.

Radio has its Horace Farnum Griffiths, of the movie world; its Washingtons, Jeffersons, Lincolns, of the political world; its Benjamin Franklins, Henry Ward Beechers, of the literary world; its Edisons, Fords and Steinmetzs, of engineering and business fame, and in the very near future it will have the same worldwide notable characters among women because it is going to be women's duty to direct the broadcasting industry by their suggestions, which suggestions must be the result of their own wonderful intuition and carefully prepared analysis. It is with this object in view that *Radio in the Home* is carrying the word to thousands of women's clubs by talks throughout the United States.

The next side of our investigations has been the apparatus side. Just considering the seventy-five rated concerns, to compile their histories, their financial standing, to visit them, to study their personnel, to get their viewpoint on the past, the present and the future, to test their products, has been, as far as we are concerned, a great task of itself—far too great to go into at the present time. To divide this off into sets, parts, accessories, amplifiers, phones, batteries, etc., is really a greater task than many could conceive.

Home is the most beautiful word in the world, the word around which [illegible]

HARRY P. DAVIS, '90

AS vice-president of the Westinghouse Company, Mr. Davis has charge of all production and engineering undertakings of the company. While he has not been engaged directly in railroad work, he has been responsible for much of the development in that branch of the electrical industry. There are credited to his name no less than seventy-seven patents, between thirty and thirty-five of which have been linked directly

or indirectly with the railway industry.

Among the patents held by Mr. Davis are devices for improvement on overhead trolley construction, systematic control of railway equipment and electric current measuring instruments. The company, with which he is identified and in whose progress he has played so notable a part, has made many contributions to the railway industry and has affected economy, superior operation and many other advantages in transportation facilities.

As described in the November issue of the JOURNAL, Mr. Davis has been largely responsible for the success of radio broadcasting. Another feat which has recently been successfully accomplished is the starting of a railway train by wireless.

...L ADVANCE

1923

RADIO WOES ENDED BY RADIO FATHER'S BROADCASTING PLAN

H. P. Davis, Vice President, Westinghouse Company Suggests National Commission To Control Broadcasting

With the idea in view of greatly expanding the usefulness of radio telephone broadcasting, H. P. Davis, Vice President of the Westinghouse Electric and Manufacturing Company, nationally known as the "Father of Broadcasting", has suggested a plan for the establishment of a national broadcasting service.

Mr. Davis thinks that a regulating body should be formed to control broadcasting. In an interview, he said: "On the assumption that broadcasting, if not already so, will soon develop into a stable public utility, where the public interest would become paramount, it would appear to us as though the regulating machinery should follow the pattern that has been worked out with other utilities—namely, the establishing of a Public Service Commission which, in the case of radio, would be an Interstate Radio Commission, and, therefore, a Federal Commission created by Presidential appointment.

H. P. DAVIS

"This Commission should be vested with full power and authority to make regulations and enforce same to the full extent of existing laws.

"All requests for licenses should come to and be approved by this body, and when an application for a license is approved and the license given, it should take on the nature of a franchise which should be enjoyed by the owner so long as he gives the service required. This is important, because a large investment is necessary and in order to encourage the making of the instrument and protecting it afterwards the owner so long as he follows the regulations of this Commission will have assurance of a definite tenure in his ownership."

Pittsburgh Post
Feb. 15, 1923

Brilliant Ceremonies Mark Inauguration of Pittsburgh Post New KDKA Radio Studio

Distinguished Personages and Artists Join With Westinghouse and Post Officials In Opening New Era In Broadcasting.

PROGRAM DRAWS FLOOD OF CONGRATULATORY WIRES

Surpassing brilliance marked the opening last night of The Pittsburgh Post's new KDKA radio studio, peerless among the radio broadcasting stations of the world.

With one of the finest programs ever given, the new home of KDKA in The Post building was officially opened, and the first of a long series of unparalleled programs was carried out for the entertainment of the multitude of friends of Pittsburgh's foremost newspaper.

Hundreds of congratulatory telegrams poured in from every nook and corner of the United States. Telephone lines were glutted with messages of felicitation and appreciation. Hundreds of listeners had extended their congratulations upon the opening of the new studio before the program was half finished.

Distinguished persons and scores of KDKA artists, as well

(Continued on Page Four, Col. Four.)

Man Here Sings to Mother in London

KDKA Sets Record in Radio Broadcasting.

...ing at the fireside in her London ..., her radio set in operation, Mrs. ...ingale heard the voice of her son, ... Nightingale, last night. The son was in Pittsburgh, singing before a microphone in the studio of KDKA broadcasting station.

Mrs. Nightingale was a proud woman. It is the first time a singer had broadcast from KDKA with such an objective this being a test conducted by the Westinghouse Company relaying via English broadcasting stations so that an operator with a crystal detector set or small tube set could listen to programs broadcast here.

The New Year's greeting broadcast from the East Pittsburgh studio by H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, and recognized as the father of radio broadcasting, was received by listeners-in in the British Isles, according to a cablegram received from A. P. M. Fleming, manager of the research department of the Metropolitan-Vickers Electrical Company, Manefield, England, who also sent a cablegram notifying Nightingale that his mother received his local numbers.

Next time you see an erstwhile dignified neighbor astride the ridgepole of his domicile, with a coil of bare copper over his shoulder and an insulator sticking out of each pocket, think of H. P. Davis, vice-president of the Westinghouse Electric & Manufacturing Company. He's the man who started it all. Mr. Davis was first to suggest the idea of radio broadcasting, and is the leading spirit back of his company's stations.

1923-24

Brilliant Ceremonies Mark Inauguration of Pittsburgh Post New KDKA Radio Studio

(Continued From Page One.)

as officials of the Westinghouse Electric and Manufacturing Company attended the opening. The ceremony was carried out without a hitch. Millions of unseen listeners were taking part in one of the greatest events of the age--the consummation by The Pittsburgh Post, first newspaper in the world to adopt the radio, of a step to give its readers and friends the best radio entertainment money can secure.

The opening of the new radio studio meant that thousands of dollars had been expended for the entertainment of the public, in the pursuance of the great newspaper's policy of giving unexcelled service. It means that the most modern and most nearly perfected radio devices in existence had been brought into play for the entertainment of The Post's great invisible audience. The opening of the new studio will go down, not only in the annals of newspaper history, but in the chronology of great events in radio telephony.

Among the representatives of the Westinghouse Company who attended the opening were H. P. Davis, vice president of the company, and "father of radio broadcasting;" C. W. Horn, superintendent of radio operations; John Frazier, manager of the telephone department; L. R. Rosenberg, assistant to the manager of publicity; P. M. Land, in charge of programs, and Victor Saudek, director of the Little Symphony Orchestra.

Promptly at 6 o'clock the prelude to the opening of the studio began. At that time the Little Symphony Orchestra, augmented by additional musicians, began its first number. This was the special dinner concert which had previously been announced. The orchestra played popular and semi-classical numbers for more than an hour. The orchestra was directed by Victor Saudek.

Decked With Flowers.

But even before 6 o'clock the beautifully decorated ante-room of the studio had begun to fill with visitors. From this room the distinguished guests passed into the studio proper, into one of the most artistic and luxuriant studios imaginable.

Brilliant lights dropped their golden glow upon the walls and ceiling, which were draped in Monk colored cloth of faun. In the ceiling, surrounded by the shaded lights, the cloth was gathered in an artistic rosette. The room is furnished in wicker and under feet is a heavy plush rug. Last night the studio was literally filled with flowers of all varieties. On the walls and in vases on the little tables roses added their color to the brilliance of the general effect. The microphone stands in a south corner, and adjacent to it is the expensive grand piano, which so many KDKA listeners have heard with so much pleasure. The microphone is the highest achievement of radio science, and is as nearly perfect as engineers have been able to make such an instrument. In procuring it the management of The Post set out to obtain—and did obtain—the very best.

Entertainment Provided.

Following the Little Symphony Orchestra concert the "Thank-U" company, which is playing at the Nixon Theater this week, entertained. This company was composed of Harry Davenport, Frank Monroe, Leslie Palmer, John Seymour and Miss Joan Shaw. Mr. Seymour sang several numbers, with Miss Shaw at the piano, and Mr. Palmer gave several recitations, among which were 'Hindoo's Paradise" and Shylock's speech from the "Merchant of Venice."

A. E. Braun, president of The Pittsburgh Post, then made an address. He invited the "invisible audience" of the great newspaper to partake in the entertainment provided by the new studio, emphasizing the fact that in opening the new studio, "The Post feels that it is merely keeping its faith as an institution of public service, founded in newspaper confidence." Mr. Braun said:

"Tonight the Pittsburgh Post welcomes its great unseen family to a new, more ample fireside. In two years of radio broadcasting the little inglenook that once seemed so spacious has been outgrown. Since those first days when The Post blazed its way into new fields, radio has prospered prodigiously. True to its purpose, The Post endeavors, not merely to keep pace, but to advance the progress of an activity that has already emerged from the realms of interesting diversion into the greater plane of indispensable necessity.

"In opening its new studio The Post feels that it is merely keeping its faith as an institution of public service, founded in public confidence. Whatever has been achieved by this newspaper in radio broadcasting is made possible by the unfailing support, the constructive criticism, and the generous appreciation of you who are gathered about this mystic fireside tonight.

"On behalf of The Pittsburgh Post, may I reciprocate those many expressions of loyalty and felicitation that have been fuel to our common heartfire. In the future, as in the past, it shall be the endeavor of The Post to keep clean the fire, that all the smoke may go up the chimney, and that only the ruddy glow of good cheer may radiate to the great world family of KDKA."

H. P. Davis, vice president of the Westinghouse Electric and Manufacturing company, and "father of radio broadcasting," then spoke.

Following Mr. Davis' address, DeWolf Hopper, who is appearing at the Alvin theater this week with Gilbert & Sullivan's light opera company, told some of his famous stories. Mr. Hopper supplied his usual stage gestures with the narratives, much to the entertainment of the guests, who by this time had filled the new studio.

Mr. Hopper was followed to the microphone, after he had been photographed by The Post staff photographer, by Harry Lang, whistler, who is appearing at the Davis theater this week, and his accompanist, Stephen Miller. He gave his favorite whistling selection, "You."

The "Dreamtime Lady From Storyland," Helen Vogelsong, who delights thousands of kiddies each night, then told a bedtime story of the little black boy and his cake. A trio from the Fellows' club, Burt Mustin, Jack Thompson and Ollie Riehl, then entertained. Mr. Mustin and Mr. Thompson first gave their parody on "Gallagher and Shean." Mr. Mustin followed with "You Tell Her, I Stutter," and Mr. Thompson concluded the trio's program with a monologue, "The German Senator."

"Dainty Dorothy" Waters, nine-year-old child entertainer of the Keith circuit, then sang several songs. She was accompanied at the piano by Mr. Miller. Dorothy sang "Wireless to Heaven," "Georgie" and "Carolina Home." Arthur Love, humorist, musician and entertainer, gave two numbers on the piano, "The Bells," an original composition, and "The Chimes," an imitation of the Calvary Church chimes. It was announced, following Mr. Love's contribution, that a telegram, the first, had been received from Harry K. Bianche of Montpelier, Vermont. The message read:

"Concert coming in fine. Hopper certainly is some story teller. Acknowledged by radiophine. Harry K. Bianche."

The special opening night program was concluded with a concert by Howard D. Israel's "Peerless Serenaders." In addition to the orchestra numbers, Paul Brown played a selection, "Lovin' Sam," and Harold Noble played "The Twelfth Street Rag," on two instruments, the saxophone and clarinet. The special program was followed by the regular entertainment of KDKA.

Those who took part in the regular program were Mabel Jefferson, soprano; Alan B. Davis, baritone; Alice Kirk, accompanist. They were accompanied by the Little Symphony Orchestra. Miss Jefferson sang the Aria, "Elsa's Dream" from "Lohengrin," "The Crystal Gazer" and "The Mocking Bird." Numbers by Mr. Davis were "The Shepherdess," "Standing in the Need of Prayer," "Lorraine, Lorraine, Lorree," and the aria, "It is Enough," from "Elijah."

World Anti-War Meet Impracticable Bonar Law Asserts

LONDON, Feb. 14.—(By the Associated Press.)—Prime Minister Bonar Law, replying today in the House of Commons to the suggestion made by a Labor member that Great Britain initiate the calling of a world congress, including representatives of America, Germany and Russia, with a view to preventing another war, said he thought the proposal was impracticable.

UNVEILING OF RADIO TABLET DRAWS MANY

Unique Ceremony at Calvary Episcopal Church, Cradle of Service Broadcasting.

More than 1,000 persons gathered in front of Calvary Episcopal Church last night, following the regular service, to witness a unique ceremony, the unveiling of a bronze tablet, commemorating the first church service ever sent broadcast by radio. H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, and father of radio broadcasting, was present and spoke. In addition to the visible audience there was another "listening in." It was made up of radio votaries from Hudson bay to Mexico, and from the Atlantic to the Pacific. This group heard the speeches, the singing of the surpliced choir and even the rumble of the passing street cars. Mr. Davis said in part:

"Other cities have memorials, but Pittsburgh is proud to be the first to broadcast by radio to the world her own religious worship. . . . Pittsburgh is further proud to have as a citizen Rev. E. J. Van Etten, rector of Calvary, the first minister in the world to catch the vision of sending his message out into the highways and byways by radio.

"It is impossible for me to express in words the great good he has done to thousands of people by recognizing and using radio for such a noble purpose. It has enabled him to reach and to console the sick and the shut-ins all over this continent, without detracting one iota from the excellent work he is doing in his own parish. Mr. Van Etten has reached suffering people who have been cut off from church services for years and who never expected to hear church services again. His initiative has made possible this splendid memorial gift from which I have just lifted the American flag, 'which' Calvary always will point to with pride.

"This testimonial of appreciation has come back to Calvary from the unseen congregation. The bronze tablet, for which contributions have come from more than 4,700 people in 40 different states, in five Canadian provinces, from ships at sea, from England, Mexico, Honduras and from Cuba, is installed to commemorate in a prominent and permanent way the pioneering done by Calvary Church of Pittsburgh and Station KDKA in radio broadcasting of church services."

The memorial tablet is 30x24 inches. On it is the following inscription: "January 2, 1921, from Calvary Church, for the first time in history a church service was broadcast by radio telephone by the Westinghouse Electric and Manufacturing Company. This tablet was placed 1923 by the unseen congregation."

Rev. Van Etten, who has preached nearly every Sunday to his radio congregation since his first sermon in 1921, declares the radio possibilities for the clergy to do good work are boundless.

"Mission churches without a parson may have the best religious services," he said. "Hospital wards have been equipped. Our parish is doing organized work by wireless. We want several receiving sets. The church home hears our services through one of the sets we won. The invalids of the parish are enjoying the use of two others. Outside our own parish family groups all over the country gather at the library table for a wireless Sunday night worship. Thousands can have services who never had the chance before. I feel radio is a wonderful boon to the church."

Pittsburgh Post
February 15, 1925

The Post Blazes Way In Newspaper Radio Service, Says Davis

Westinghouse Official Sees Great Future For Studio.

LINKS ARTISTS TO AUDIENCES

The pioneering of The Pittsburgh Post in the field of radio broadcasting of news was described by one of the men who made radio, H. P. Davis, vice president of the Westinghouse Electric and Manufacturing company, speaking over the radio last night from the new Pittsburgh East studio of the KDKA.

Mr. Davis' address was in connection with the elaborate opening program broadcast last night from the new Post studio. Mr. Davis said:

It gives me great pleasure to greet the vast radio audience of KDKA and speak at the opening of this splendid new Pittsburgh Post-Westinghouse studio, and again I am reminded of the great progress made in radio during the past three years since public broadcasting began.

Here I am standing in a beautifully furnished new studio, which contains every latest appointment that we know of to make more perfect broadcasting.

There are heavy carpets on the floor, and the walls are covered with monk cloth to absorb vibration and prevent echoes. An expensive piano stands at my left. In front of me is a microphone of the latest design, which, by the way, is different from any other pick-up or microphone used for broadcasting.

The reception room just outside the studio is a gem, and the walls are decorated with photographs of well-known people, all of whom have spoken to or entertained the radio audience from The Pittsburgh Post studio at one time or another during the past year.

This new studio has cost The Pittsburgh Post thousands of dollars. The officials of The Pittsburgh Post have consulted the best talent available and undertaken considerable research to determine the best kind of studio to install. After finding out what was needed, more difficulties were encountered—but successfully solved—in obtaining the necessary space for building such a large studio.

Yes, The Pittsburgh Post has done its best to please. But to please whom? Why, the radio listener—commonly termed the invisible audience—something that was unknown less than three years ago, when the Westinghouse Electric and Manufacturing Company started KDKA, the first broadcasting station in the world to transmit radio telephone programs on a daily schedule.

This audience has grown and grown from a mere handful of people from that time to thousands of people, scattered over a vast area, at the present time. Every night there are millions listening to radio programs, and of this number a goodly percentage are listening not only to radio programs in their immediate vicinity, but also to programs broadcast from points hundreds of miles away.

It can easily be seen that an audience which can hear a concert in Pittsburgh, New York, Chicago or Cuba, just as fancy wills, in a short time will be satisfied to listen to those stations only which present the best talent available, and broadcast their entertainments in the the best way, that organizations like the Westinghouse Electric and Manufacturing Company and others are spending thousands of dollars monthly in research, broadcasting equipment, studios, and other things incidental to broadcasting.

It is for this same reason that the Pittsburgh Post has discarded its old studio and has constructed and equipped this magnificent room.

When speaking of the origin of broadcasting, it must be remembered that the Pittsburgh Post has been a pioneer. Its early work did much to enlist the public interest, and it holds a number of records. For instance, the Pittsburgh Post was the first newspaper in the world to print daily broadcasting schedules. When KDKA was first put into operation and an effort was made to get newspaper publicity for the broadcasting programs, the Pittsburgh Post was the first newspaper to respond and to print this service.

The managing editor tells me that he was only living up to his newspaper's slogan when he printed these schedules—but whatever the reason, the fact remains that it was The Pittsburgh Post which did it first. It is estimated that now two-thirds of the daily newspapers in the United States are printing daily radio programs, and this number—as large as it is—is still growing. Following the inserting of the programs and noting the growth of broadcasting popularity, the management of The Pittsburgh Post planned and studied ways to assist in the KDKA programs.

To that end, a studio was installed on the fourth floor of its building in downtown Pittsburgh, and connected directly by telephone line with KDKA at East Pittsburgh—about 12 miles away. This downtown studio was an ideal place for the broadcasting of prominent people in the theatrical or social world, and greatly enlarged the scope of KDKA's programs.

It enables the broadcasting officials of KDKA to book many artists or speakers who otherwise would not have been heard from the station because the time at their command would not permit a trip to East Pittsburgh and return before the evening's engagement.

The Pittsburgh Post studio proved to be very popular and successful. From this studio such well-known figures in public life as Governor Pinchot, Senator George Wharton Pepper, Congressman M. Clyde Kelly, Otis Skinner, Robert Mantell, David Wark Griffith, Lillian Gish and a host of others, were heard.

The Pittsburgh Post studio thus served as a link between professional artists and others prominent in public life and the radio audience.

Now, because of changes and improvements such as the march of time demands, the original studio was found to be too small, and with characteristic enterprise the Pittsburgh Post discarded it and has provided this wonderful new studio and equipment.

Thus the new studio came to be, and I can assure my hearers tonight that from it there will be broadcast an even larger number of events than has been done in the past. Radio broadcasting is a science in which only the swift can survive the race. In nothing else will the march of time be so ruthless to those who cannot keep up. Hardly a day goes by but what some new appliance is perfected, which immediately puts into the discard some existing apparatus.

However, have no fear that the Pittsburgh Post will find the pace too swift, for it has shown in the past that it

The First Radiophone Station

AN IDEA THAT WAS SUGGESTED BY A NEWSPAPER ADVERTISEMENT; TO WHAT PROPORTIONS IT HAS GROWN

THE first man to conceive the widespread use and popular appeal of radio was Harry Phillips Davis, vice-president of the Westinghouse Electric and Manufacturing Company. The idea occurred to him one morning in September, 1920, while reading an advertisement in a Pittsburgh newspaper. In a corner of a full page ad he came across this: "Mr. Conrad will send out phonograph records this evening." The line referred to the store's amateur radio department and was in explanation to local radio fans that Mr. Frank Conrad, who had operated his station intermittently since the war, would send out by radio, phonograph records on a certain evening.

He went to Mr. Conrad, assistant chief engineer of the Westinghouse Company, and announced: "Frank, I am going to close your s[illegible]on," and paradoxical as it may seem this was the actual start of radio broadcasting as we now know it in America. The concerts on regular schedule, advance programs, and entertainment of all kinds in the air, all resulted in the closing of Mr. Conrad's station and the opening of KDKA, the first radiophone station in the world.

The Conrad station was very well known to amateurs all over the country, for it was one of the few amateur stations licensed to operate during the war. This special operating was in the interests of government research work which the Westinghouse Company was doing and also to test some apparatus.

Widened Its Scope

Mr. Davis was struck with the fact that the radiophone fundamentality did not lend itself only to private communication but that it had a universal field of usefulness and that through it, one could communicate to hundreds, thousands or millions; all could listen who had the suitable "ear," for if a certain class of people were interested enough to listen to music from a few records, there was a possibility of increasing this small audience of radio listeners to an enormous number by sending out entertainments, current events, etc., in a regular and interesting manner. Why confine one's audience to a small portion of the country? Why not build a big station and let everyone, who wanted to, hear? Why not make radio broadcasting a public service?

"Frank, my idea is that you stop sending from your station and we will start a regular service from our experimental station here at East Pittsburgh," Mr. Davis advanced. "We can arrange for a suitable wavelength, and I believe if we do this it will be the beginning of a radio broadcasting public service which seems to me to have wonderful possibilities."

The conference with Mr. Conrad lasted a short time and Mr. Davis called other conferences before actual work on the broadcasting started. It was not until November 11, 1920, that KDKA was formally opened with the broadcasting of election returns.

The remainder of the history of KDKA is now common property. Everyone, almost, now knows that there are over 200 broadcasting stations in the United States and that the radio audience numbers into the millions each night.

A Little Ad Did It

Not everyone knows, however, that it was a single line in a newspaper which suggested to the vice-president of one of the largest electrical manufacturing companies in the world, the big thing of turning a scientific novelty into a new kind of public service by unfolding a new field of communication.

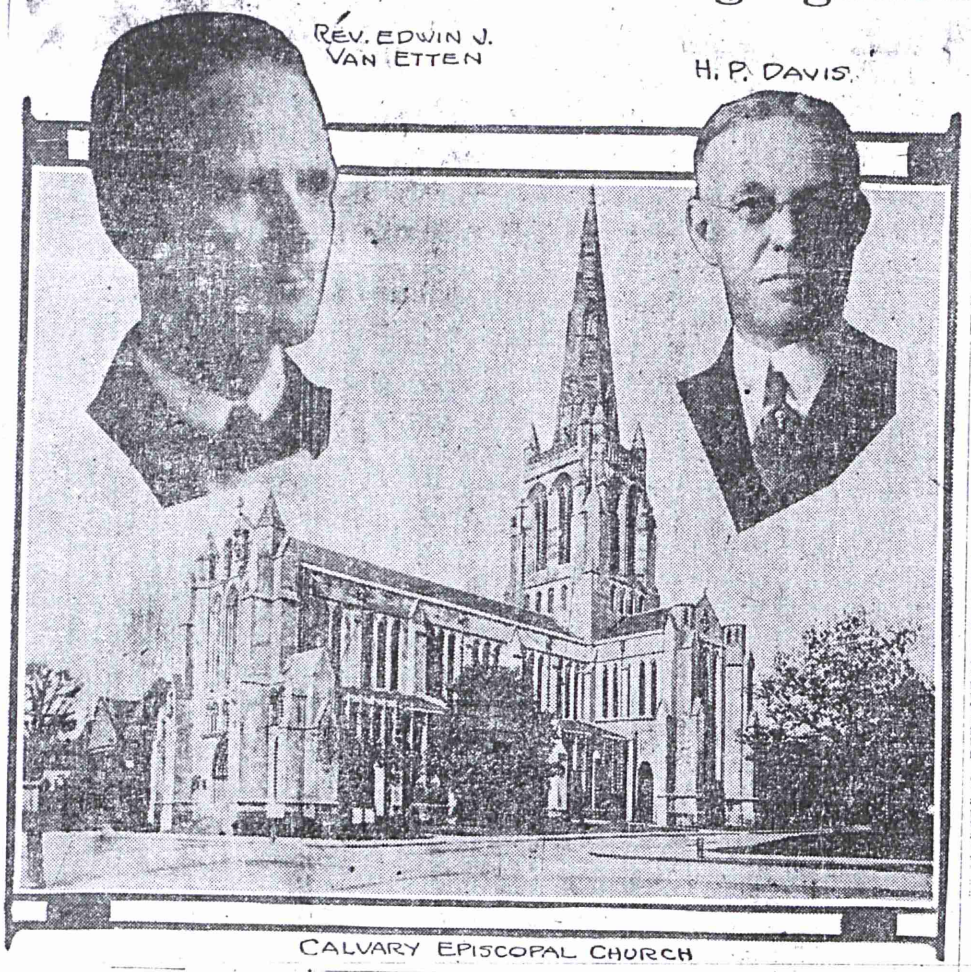
Mr. Davis was one of the best equipped men in the electrical industry to take up the difficult problems of broadcasting. He has been a leader in the electrical industry since his college days, and has been issued nearly 100 patents covering electrical apparatus. He is an engineering genius and is known, not only as a designing engineer of high rank, but also as a man who gets things done. His ability to accomplish results rapidly has already been proved in the history of his company's broadcasting achievements.

Mr. Davis was born at Somersworth, New Hampshire. He graduated from the Worchester Polytechnic Institute with the degree of B. S. in Electrical Engineering in 1890, and after a trip to Europe and a few months spent with the Thompson-Houston Company, entered the Detail Engineering Department of the Westinghouse Company, in 1891.

He Opened Station KDKA

HARRY PHILLIPS DAVIS, vice president of the Westinghouse Electric & Manufacturing Company, was the first to foresee the popularity of radio, and formally opened Station KDKA by broadcasting election returns November 11, 1920, from the experimental station, East Pittsburgh, Pa. This was the first radiophone station in the world. Today there are over 250 broadcasting stations in the United States.

Calvary Church To Unveil Tablet Tonight, Given By Unseen Radio Congregation



CALVARY EPISCOPAL CHURCH

Fund Contributed by Wireless Service Listeners-In.

Episcopal churches all over the country will make the announcement today that a bronze tablet, probably the most unusual in the world, contributed by and dedicated to the unseen radio congregation of Calvary Church, will be unveiled during the church services tonight.

Rev. Edwin J. Van Etten, pastor, who was the first minister in the world to have his services broadcasted; Bishop Alexander Mann of the Pittsburgh Episcopal diocese; H. P. Davis, "father of radio broadcasting," representing Station KDKA of the Westinghouse Company, which station first broadcast the church services, and other prominent Pittsburghers will take part in the ceremony.

More than 4,700 persons, representing 40 states of the Union, five provinces of Canada, Cuba and Bermuda, London, England, even sailors from ships sailing the Atlantic ocean, contributed to the purchase of the tablet. The contributions came in every form of legal tender—silver dimes, stamps, nickles, pennies and checks. There were a surprising number of Canadian dimes. A worker in the southern cotton mill sent Dr. Van Etten two cotton socks with a nickel in each toe. A sailor from a boat on the Atlantic sent the minister 120 pennies he had won playing penny ante.

Response Instantaneous.

These contributions came as a result of Rev. Van Etten's idea that his radio congregation, to which he had been preaching since January 2, 1921, might like to contribute to some sort of memorial. Accordingly, during the reading of his regular church announcements, Dr. Van Etten addressed, directly, his unseen hearers and told them of a plan to have smal contributions from such of them as might like to participate. The sum obtained from the contributions was to be used for a memorial dedicated to them.

Responses to this idea were almost instantaneous. An hour after the announcement was broadcast contributions were received from residents of Pittsburgh. People living in the district even walked to the minister's home a few minutes after they had heard his voice by radio and left their contributions, even as he was preaching by radio.

The first announcement was sent out into the ether one Sunday last February and contributions have been coming into Calvary Church ever since. The amount obtained, all of it in small contributions has been enough to purchase a beautiful bronze memorial tablet.

Was Pioneer S[illegible]

The tablet is 30x24 inches in [illegible] it is a relief map of the territory where Calvary Church has been heard and this includes all of the United States and a considerable surrounding territory in Canada, Mexico and the oceans. The map is criss-crossed by jagged lines, indicative of radio waves, emanating from the radio station at East Pittsburgh, where the church services go out into the air. On the tablet is the following inscription which undoubtedly will be read with great interest in the years to come: "January 2, 1921, from Calvary Church, a church service was broadcast by radio telephone by the Westinghouse Electric and Manufacturing Company. This tablet was placed in 1923 by the unseen congregation."

In those early days of radio, as indicated by the date on the tablet, it took a pioneer in every sense of the word to agree to have the church services broadcast by radio telephone. It took a pioneer churchman and a pioneer station to do it. Station KDKA was the broadcasting pioneer, Calvary Church was the religious pioneer and Rev. Van Etten the ministerial pioneer. All these factors in the first church broadcasting are now seeing the day when there are many, many churches broadcasting services and hundreds of radio telephone stations to broadcast them. In 1921 there were perhaps five or six stations and only one church.

Rev. Van Etten, who has preached nearly every Sunday to his radio congregation since his first sermon in 1921, is of the opinion that the possibilities for the clergy in doing good work are endless.

Boon to Church.

"Mission churches without [illegible] may have religious services," Van Etten points out. "Hospitals have been equipped. Our parish is organized [illegible] by wireless; several receiving sets. The home hears our services throu[illegible] of them. Two invalids of the pa[illegible] enjoying the use of two other [illegible] side our own parish family gr[illegible] over the country gather around the library table for a new manner of Sunday evening worship. Thousands and thousands of people can have church services now who never have had the opportunity before. I feel that radio is a wonderful boon to the work of the church. Like the men who sent the first cable message across the ocean we should exclaim reverently of radio 'What Hath God Wrought.'"

The entire services, including the dedicatory address as well as the Calvary Church services, will be broadcast by Station KDKA.

News-Tribune,
Wilmerding, Pa.
April 5, 1923

RADIO WOES WOULD BE ENDED BY PLAN OF DAVIS

Father of Radio Broadcasting Suggests Formation of National Commission

With the idea in view of greatly expanding the usefulness of radio telephone broadcasting, H. P. Davis, vice president of the Westinghouse Electric & Manufacturing Company, nationally known as the "Father of Broadcasting", has suggested a plan for the establishment of a national broadcasting service.

Mr. Davis thinks that a regulating body should be formed to control broadcasting. In an interview, he said: "On the assumption that broadcasting, if not already so, will soon develop into a stable public utility, where the public interest would become paramount, it would appear to

H. P. Davis

us as though the regulating machinery should follow the pattern that has been worked out with other utilities—namely, the establishing of a Public Service Commission which, in the case of radio, would be an Interstate Radio Commission, and, therefore, a Federal Commission created by Presidential appointment.

"This Commission should be vested with full power and authority to make regulations and enforce same to the full extent of existing laws.

"All requests for licenses should come to and be approved by this body, and when an application for a license is approved and the license given, it should take on the nature of a franchise which should be enjoyed by the owner so long as he gives the service required. This is important, because a large investment is necessary and in order to encourage the making of the instrument and protecting it afterwards the owner so long as he follows the regulations of this Commission will have assurance of a definite tenure in his ownership."

Westinghouse Wizard, Father of Radio Broadcasting

Harry P. Davis, Master of Electrical Detail, Won Big Job Through Infinite Capacity for Taking Pains with Little Things

By O. D. Foster

IN THE EARLY DAYS of the development of electrical energy, when the boilers at the Pittsburg plant of the Westinghouse Electric & Manufacturing Company were fired with natural gas, a tall youth became an apprentice in the shop. Without attracting much attention, he went about his business, picked up the detail of the shop, finished up odd jobs, and made himself generally valuable. His bent was experimentation in electrical engineering, but his keen eyes and alert brain were actively studying shop methods, systems, and manufacturing requirements.

Gas pressure was often very low, and it was only during the late hours of the night that the gas supply was sufficient to fire the boilers to a point where necessary tests could be made.

Late one night the shop superintendent returned to the plant to get something he had left in his desk. He was greatly surprised to find the tall youth bending so eagerly over his work bench that he did not even notice his entrance.

"Trouble, Davis?" he asked a little curiously.

Startled, Davis looked up and flushed a little under his chief's inquiring gaze.

"No," he said, somewhat embarrassed. "But I can work better at night. You know we can't get steam enough during the day to do our testing, and there are lots of ideas I want to try out."

After that the chief dropped in now and then when he happened to be in that neighborhood, and almost without exception he found the young man at work. Sometimes he was testing, sometimes working out a difficult experiment; but it was a rare thing not to find him in the shop. The department head began to watch Davis's way of handling his duties. There were no half-baked plans, hastily conceived and imperfectly executed; no wild experiments, carried out at a serious waste of time and material; and no bombast or apparent desire to attract attention. The youth went quietly about his business, did his work faithfully and well, and then, each day, *added just a little more to it in thought, initiative and labor* until he lifted himself out of the ranks.

HARRY PHILLIPS DAVIS
Vice-President, Westinghouse Electric & Manufacturing Company

This was the beginning of the career of Harry Phillips Davis, now vice-president of the Westinghouse Electric & Manufacturing Company, in charge of engineering and manufacturing: father of radio broadcasting and known internationally, not alone for his numerous inventions, but also as a remarkable organizer, systematizer and an enthusiast on the future possibilities of electrical development.

Young Davis climbed slowly at first, but steadily, step by step he progressed in the engineering work, and before long his superiors began to delegate difficult or important duties to him.

"Turn that over to Davis," came to be the paraphrase for "Get it off your mind." For, once in his hands, an operation was cared for and followed up to its conclusion, regardless of whether the commission was the simple transfer of a deputized order or the working out of some complicated experiment. Once given over to him the work became his responsibility; it was not shifted to the shoulders of another or slighted because he did not consider it of great importance. In his opinion each job, no matter how small, was worthy of his best attention and could not be released until it was 100 per cent. accomplished.

For background he had the training of the Worcester Polytechnic Institute, which he entered on a scholarship, and from which he graduated with honor with the degree of B. S. in Electrical Engineering. For a year after he graduated he taught at the institute, then came several months abroad, and after spending a brief period with the Thompson-Houston Company he entered the engineering department of the Westinghouse Company in 1891. Within a few years he organized the detail engi-

neering department and later became manager of engineering. This position he held until 1911, when he was made vice-president, in charge of manufacturing and engineering.

Backgrounds are important. They either make or mar. Young Davis had spent many precious hours of labor on the background which was to be the setting for his future career. Sometimes he may have wondered, as boys will, whether the game was worth the price. Many times he was thoroughly discouraged, but he always went doggedly back to work, determined that no weakening on his part should mar his chance of successful accomplishment. One of the men who worked with him in those early days told me that many a night during the early period of the electrifying of the street railways, one could have found young Davis in the shops at the car barns until two or three o'clock in the morning—and sometimes all night—testing out the Westinghouse equipment, making inquiries among the men as to trouble causes, studying into the most minute details with a marvellous accuracy of judgment. No complaint was too small to merit his earnest attention. If a man had had trouble with the apparatus, Davis wanted to know *how* and *why* and what finally remedied it.

Saw Early Possibilities in Radio

As a consequence, there is, perhaps, no technician in this country to-day who has a greater mastery of the detail of electrical development than has Harry P. Davis.

The greatest indictment which can, as a rule, be laid against a mind strong in detail matters is lack of progress and initiative. Contrary to usual precedent, Mr. Davis is as keen to seize a new opportunity as he is to work out the infinite detail of a complicated problem. Usually the mind which is bent to the working out of intricate problems involving technical skill finds it difficult to act swiftly on general questions, nor is it often thoroughly in tune with public demands, having studied so intensively in its own specialized range. Let us see what happened to Mr. Davis.

In the Summer of 1920, Frank Conrad—now assistant chief engineer of the Westinghouse Electric & Manufacturing Company—who had made an exhaustive study of radio possibilities during the war period, began experimenting when the government ban was lifted by sending out Friday night concerts from his amateur station to his friends. The experiment aroused unusual interest. Then Mr. Davis,

Dorothy Francis, formerly prima donna of the Chicago Opera Company, broadcasting from the Westinghouse Electric Company's station at the Waldorf-Astoria Hotel, New York

upon reading a newspaper advertisement inserted by a department store for the purpose of calling attention to its amateur radio department, was set thinking.

His mind conjured up the remarkable opportunity for a new communication service having the broadest possibilities for wide publicity and utility. Up to that time radio had been more or less in the hands of experts, whose ideas were its development as an extension of existing communication service, and the horde of amateurs mostly made up of young boys, and it had been used either for individual communication service, as in the war, or for the youngsters' amusement. If Conrad had aroused interest through these limited attempts, thought Davis, what could not be accomplished through organized and properly administered effort, with the talent of the country on tap for the public at large!

Visualizes Benefits to Mankind

Swiftly his mind encompassed the vast range of possibilities. What would it mean to the farmer's wife, alone in an isolated hamlet, to pick up a radio set and hear Wagnerian opera, the dream of a lifetime! What would it mean to the shut-in, deprived of all contact with the outside world, to listen to lectures, concerts, the news of the day! What would it mean to the blind man, or cripple, unable to follow the pursuits of boyhood and manhood, to listen in and get the score on some popular football game, hear the wild cheers of the spectators and visualize through the careful description of the operator exactly what was happening on the football field! What would it mean to people in hospitals, on pain-racked beds!

Develops Practical Side

Nor was this all. The moving panorama showed him a picture of communication which would reach to the very bowels of the earth. With radio apparatus properly installed it has been demonstrated that it is possible to communicate with entombed miners and carry to them messages of hope and sympathy to renew their courage. Ships at sea were already using the radio for the most humanitarian purposes, carrying medical advice to ships out of reach of land or a physician, as well as conducting burial services at sea, administering the rites of consolation to dying men, carrying news of disaster and hope of rescue. What might it not mean to the mining camps, the logging camps and others, shut in for months in a dead wall of snow, to be able to lighten their weeks of inactivity by keeping in touch with the world outside!

Thus Mr. Davis visualized the enormous possibilities of radio development. Then he set to work to develop them from the practical side. It was about this time that the presidential election came along. This offered an excellent opportunity for trying out the public's interest in receiving news of this character, and on the evening of November 3 the news of Harding's election was broadcast from the East Pittsburgh laboratory. This was so well received that

(*Continued on page 278*)

Westinghouse Wizard, Father of Radio Broadcasting

(*Continued from page* 262)

Davis at once threw himself into the work and set out to plan other programs of equal interest.

It was not long, however, before he realized that while he had provided an innovation in the way of public service, in a large measure the service would not come into its own until there were listeners, and the only audience then existing consisted of such amateur radio experimenters as would care to give up time from their own interesting experiments to listen to the East Pittsburgh station.

This resulted in eighteen months of most discouraging work, but in spite of all set-backs, three new stations were opened, at Chicago, Newark, and Springfield, Mass.

One of the first of the plans to be put into execution was the broadcasting of a religious service directly from the church into the home. Arrangements were concluded with Reverend Edwin J. Van Etten, Pastor of the Calvary Episcopal Church of Pittsburgh, who earnestly co-operated with Mr. Davis and his asociates in broadcasting the service. This was the first time an event was ever realistically transferred from the scene of its occurance to the homes of an unseen audience.

The broadcasting of the church service met with such success that it was decided to send out some of the speeches made by prominent men at public dinners. One of the earliest was a speech made by Secretary Hoover, and this met with such favor that it was followed by the broadcasting of many others.

Tremendous Interest in Sporting Events

Next a local boxing match came along. This seemed a splendid opportunity to try out another experiment. It was decided not to limit the public to the things to be heard, but to visualize for them the attendant things they would have liked to see. A local paper arranged with one of its sporting editors to be at the transmitting apparatus at the ringside and report faithfully the progress of the bout. Each important move of the contestants was reported into the microphone. The sound of the gong, the cheers of the audience and their remarks were also transmitted as an accompaniment to the report of the progress of the fight.

This way of transmitting both sight and sound added enormously to the pleasure of the radio audience. It was followed later by the now familiar reports of ball games.

One thing which had interfered with faithful reports was the spontaneous cheering of the crowd at brilliant plays. Sometimes this burst out before the operator could get his report over to the listening fans, and it confused the program, for the listening group did not know exactly what all the cheers were about. This was rectified by installing a sound-proof booth, and to-day the operator follows the plays, reports the moves, and then "turns on" the cheering at exactly the right moment.

Solves Transmitting Problems

In its progress from its inception to its existing use, the radio might be said to have passed through three distinct stages. The first music sent out was what is popularly known as "canned." This was the simplest method, for it could be broadcast under the most favorable conditions and with little ingenuity. But this was only an initial step which gave zest to the public's appetite, and offered Mr. Davis a basis to work on. To his vigorous mind the public wanted real things, big things, current events with life to them; and so he went out for the baseball games, the sporting events, and the great open concerts. If fifteen to twenty thousand people would crowd into a stadium to listen to a concert, many of them standing all the afternoon, he was convinced that it must certainly have considerable public interest, and this was the type of program he was after for his radio fans. The broadcasting of these public events might be said to be the second step.

In every public group there always remain a few who appreciate the superlative in art, picture or story. They are not always those who are able to gratify their desires. And while we are struggling in this young country to give the art lovers what they crave, yet we are progressing slowly in popularizing prices for grand opera, in arranging great open concerts, and in opening up our museums of art. The last two years have seen great strides in the right direction, and Mr. Davis saw how he could aid in the work. A splendid start was made in the broadcasting of opera in Chicago, and because the station was central and located in a territory peculiarly well adapted to the purpose, this was heard over about nine-tenths of the United States, and was so well received that it was followed last winter by broadcasting from the Metropolitan Opera House.

One of the many problems which presented itself in the early days was the difficulty experienced from resonance in the room in which the transmitter was placed. Many experiments were tried and the first summer an out-of-doors studio was used. This demonstrated the necessity of providing an echoless room for transmitting purposes, and after much thought and a great deal of experimenting plans for the present type of studio were worked out by Mr. Davis. All studios are now constructed with acoustic properties as ideal as possible for the transmission of sound.

One such studio has just been opened at the Waldorf Astoria in New York City and will be used for the greater convenience of those soloists who are giving programs sent out by the "W. J. Z." station at Newark. The Pittsburg Post studio at Pittsburgh is a similar undertaking and makes it possible to secure the services of some of the famous stars of the country who could ordinarily be heard by only a very small portion of their present audience.

Concerts While Traveling

Each day brings new suggested uses. A bus company in Sacramento is experimenting with the installation of radio equipment for their eighty-five busses and soon we may be able to ride along the boulevards and listen to concerts from the air. Prisons are many of them being equipped with radio stations, the programs to be used being of an educational and instructive character.

Amusing stories aplenty come in continually to radio centers. There was the policeman who was peacefully traveling his beat one summer night when he heard frantic calls for help coming from a second story window. Rushing up, he rang the bell, only to be greeted by a placid woman who let him in with great astonishment. A radio program was in operation, and the sounds he had heard were part of a recitation.

If executive ability is the power to earn your bread by the sweat of the other fellow's brow, radio is even more thorough in getting things done, for it extracts from an illimitable void the concerted and individual efforts of thousands of artists as entertainment for the man who sits peacefully smoking in his own armchair.

Western Union Telegraph Circular
January 1923

MR. H. P. DAVIS, vice-president of the Westinghouse Electric and Manufacturing Company, and "Father of Radio Broadcasting," speaking of the outlook during the coming year, said recently:

"Friends of Radio:

"Has it occurred to you what a curious relation there is between us, and how little there is to let us know what the other thinks of us? * * *

"In this undertaking of ours—which in a way is a public service—we have not yet found an effective means to sense the feelings of those who make use of broadcasting service.

* * *

"We are anxious to change this situation and wish in some way to obtain a closer touch with you. * * *

"Have you ever thought what a task it is to provide a daily programme, hours in length, seven days in the week, each of which will be pleasing and satisfactory, especially when it is recognized that the service given is gratuitous by those who appear in these programmes?

"Nothing discourages an artist so much as a cold audience, and I think we must all admit that there is nothing colder than a radio audience unless we will each of us recognize that we have a duty that exists beyond the mere listening to the programmes.

"There are hundreds of thousands—yes, millions—of listeners to the nightly programmes of the broadcasting stations. At the present time this is a gratuitous service, and as far as I can personally see it is likely to always remain so.

"But even recognizing this, what is the attitude of the listeners? Are you always to remain passive and take what is offered by the broadcasting stations, or will some way be found to correct this?

"I appeal to you, therefore, for help. Write to whichever station is nearest you and give criticisms or suggestions."

From RADIO REVIEW
OF THE EVENING MAIL,
NEW YORK, DEC. 30, 1922.

Interstate Radio Body Urged by "Father of Broadcasting" as Aid

H. P. Davis Has Plan To Regulate Licensing.

WOULD HAVE TWO CLASSES

With the idea in view of greatly expanding the usefulness of radio telephone broadcasting, H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, nationally known as the "Father of Broadcasting," has suggested a plan for the establishment of a national broadcasting service.

Mr. Davis thinks that a regulating body should be formed to control broadcasting. In an interview, he said: "On the assumption that broadcasting, if not already so, soon will develop into a stable public utility, where the public interest would become paramount, it would appear to us as though the regulating machinery should follow the pattern that has been worked out with other utilities—namely, the establishing of a public service commission, which, in the case of radio, would be an interstate radio commission, and, therefore, a Federal commission, created by presidential appointment.

"This commission should be vested with full power and authority to make regulations and enforce same to the full extent of existing laws.

Would Control Licenses.

"All requests for licenses should come to and be approved by this body, and when an application for a license is approved and the license given, it should take on the nature of a franchise which should be enjoyed by the owner so long as he gives the service required. This is important, because a large investment is necessary, and in order to encourage the making of the instrument and protecting it afterwards, the owner, so long as he follows the regulations of this commission, will have assurance of a definite tenure in his ownership.

"It appears to us that there must be two classes of broadcasting stations, and, as we see it, these two classes ought to be sufficient. First, there will be stations that are national in scope—broadcasting material of national interest, and, second, local stations serving particular districts.

"In the first class, we think there should be a limited number of stations of considerable power with wave lengths arranged so that they will not interfere at any point, and located where program material always will be available. These will be national stations. They should be, if possible, privileged to the greatest extent permissible, so that they may avail themselves of existing facilities such as telephone and telegraph lines, or other means of communication from point to point, for the purpose of picking up interesting features. They, also, insofar as the public policy will permit, should be privileged, if necessary, to requisition program features for this public service.

"The national stations can, if it is desired, transmit at two wave lengths; that is, on the present wave lengths of 360 or 400 meters and also on a wave length that can be relayed. The local stations should be given wave bands that will permit existing receiving apparatus to tune in on them, but these wave bands should be separate sufficiently from the national stations so as to have no interference. It is our belief that the shorter wave lengths are desirable for the local stations, as it gives opportunity for more stations with less interference.

Permit Widest Use.

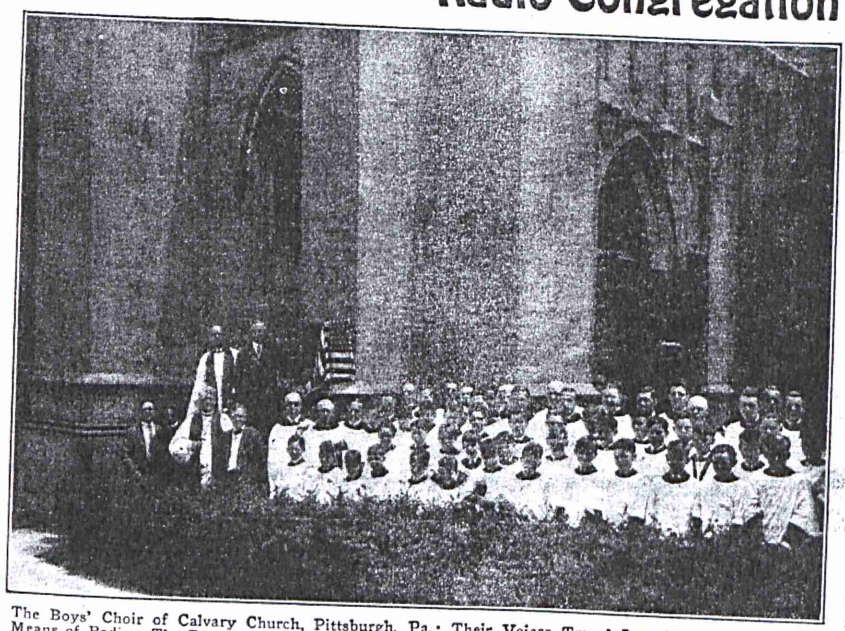
"As many of these local stations can be allowed as the discretionary powers of this commission determine, with the fact of the proper service in view to make them non-interfering. Adjacent stations can be made non-interfering by proper allocation of the wave lengths within the wave band available for this service; these local stations should hold their licenses so long as they give a service satisfactory to their listening public and to the commission.

"In operating, these local stations would supply features of local interest and in addition would relay programs or parts of programs of the national stations, selecting from the national stations such material as would interest the listeners.

"A plan of this kind can be worked out and would, in our opinion, permit the widest possible use and development of broadcasting. The service of the local stations would allow crystal set reception of distant national stations through the relaying of their programs by the local station. On the other hand, it would not prevent those having suitable receiving sets, selecting programs at will of such of the national stations as they could receive. The privilege of operating a radio receiving set shall be subject to such rules and restrictions as the interstate radio commission, acting in the interest of the public, may find it desirable to enforce.

"This plan obviously would furnish a service of special importance, and especially for those who cannot afford expensive receiving sets, as it would give them the equivalent of elaborate long distance receiving sets and would place both the national and local services at their command."

Pittsburgh Church Unveils Tablet Given by Unseen Radio Congregation



The Boys' Choir of Calvary Church, Pittsburgh, Pa.; Their Voices Travel Into Many a Home by Means of Radio. The Bronze Tablet, Contributed By the Radio Congregation, Is Seen Partially Veiled By the American Flag.

ALMOST unusual ceremony—the unveiling of a bronze tablet contributed by and dedicated to the unseen radio congregation of Calvary Church, Pittsburgh, Pa., took place during the church services recently.

The Rev. Edwin J. Van Etten, pastor of the church, who was the first minister in the world to have his services broadcast; Bishop Alexander Mann, of the Pittsburgh Episcopal diocese; H. P. Davis, "father of radio broadcasting" representing Station KDKA, of the Westinghouse Electric & Mfg. Co., which station first broadcast the church services; and other prominent Pittsburghers took part in the ceremony.

More than 4,700 people, representing 40 states of the Union, five provinces of Canada, Cuba and Bermuda, London, England, even sailors from ships sailing the Atlantic Ocean, contributed to the purchase of the tablet. The contributions came in every form of legal tender—silver dimes, stamps, nickels, pennies and checks. There were a surprising number of Canadian dimes. A worker in the Southern Cotton Mill sent Dr. Van Etten two cotton socks with a nickel in each toe. A sailor from a boat on the Atlantic sent the minister 120 pennies he had won playing penny ante.

These contributions came as a result of Rev. Van Etten's idea that his radio congregation to which he had been preaching since January 2, 1921, might like to contribute to some sort of memorial. Accordingly, during the reading of his regular church announcements Dr. Van Etten addressed, directly, his unseen hearers and told them of a plan to have small contributions from such of them as might like to participate. The sum obtained from the contributions was to be used for a memorial dedicated to them.

The first announcement was sent out into the ether one Sunday last February and contributions have been coming into Calvary Church ever since. The amount obtained, all of it in small contributions, has been enough to purchase a beautiful bronze memorial tablet.

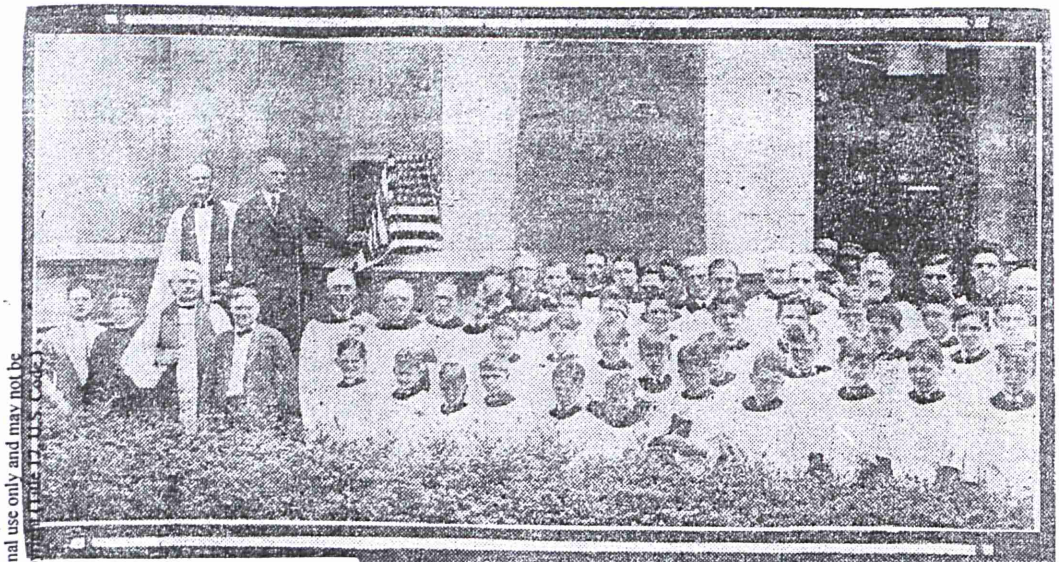
The tablet is 30 by 24 inches in size. On it is a relief map of the territory where Calvary's Church has been heard and this includes all of the United States and a considerable surrounding territory in Canada, Mexico and the oceans.

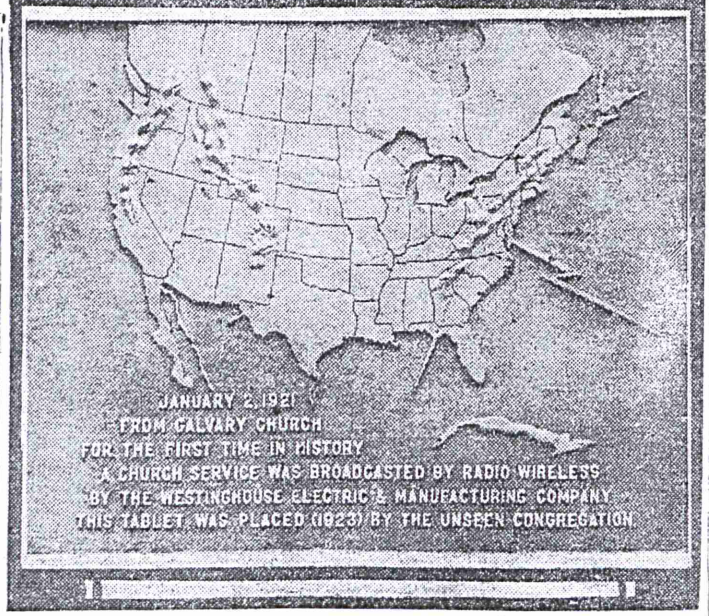
The map is criss-crossed by jagged lines, indicative of radio waves, emanating from the radio station at East Pittsburgh, Pa., where the church services go out into the air.

The entire services, including the dedicatory address, as well as the Calvary Church services, were broadcast by Station KDKA.

The Bronze Tablet, Contributed By and Dedicated To the Unseen Radio Congregation.

Calvary Unveils Radio Tablet





At the top is shown the unveiling of the tablet dedicated to the unseen radio congregation of Calvary Church. Below is a reproduction of the tablet, showing the territory covered by Rev. Edward J. Van Etten, pastor of Calvary, in his radio sermons.

thousand men, women and children filled the sidewalk and street in front of Calvary Episcopal Church, Shady avenue, last night at 9 o'clock, to see a unique tablet unveiled—the first radio memorial tablet in the world dedicated to the invisible radio congregation stretching from Atlantic to Pacific and from Hudson Bay to South America.

The words of the father of radio broadcasting, H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, made a deep impression on the visible audience, as no doubt they did on the unseen listeners covering a vast area:

"Other cities have memorials, but Pittsburgh is proud to be the first to broadcast by radio to the world her order of religious worship. . . . Pittsburgh is further proud to have as a citizen Rev. E. J. Van Etten, rector of Calvary, the first minister in the world to catch the vision of sending his message out into the highways and byways by radio.

Aid to Shut-Ins.

"It is impossible for me to express in words the great good he has done to thousands of people by recognizing and using radio for such a noble purpose. It has enabled him to reach and to console the sick and the shut-ins all over the continent, without detracting one whit from the excellent work he is doing in his own parish. Mr. Van Etten has called suffering people who have been shut from church services for years and who never expected to hear church services again. His initiative has made possible this splendid memorial gift from which I have just lifted the American flag, which Calvary always will point to with pride.

"I see in the future constant pilgrimages making way to this spot where we stand tonight to view this tablet and to read these words. You who gather about this church tonight are the first to make that pilgrimage.

"Pittsburgh is proud to be the home of Calvary Church, the first church in the world to extend by radio its services beyond its own parish, into every corner in the country, to an audience which in numbers, in denominations and in locations never before has been comprehended.

"This testimonial of appreciation has come back to Calvary from the unseen congregation. The bronze tablet, for which contributions have come from more than 4,700 people in 40 different states, in five Canadian provinces, from ships at sea, from England, Mexico, Honduras and from Cuba, is installed to commemorate in a prominent and permanent way the pioneering done by Calvary Church of Pittsburgh and Station KDKA in radio broadcasting of church services."

Mr. Davis' talk and the singing of one verse of "America" by the surpliced choir of boys and the audience, and Dr. Van Etten's brief benediction all were broadcast by Westinghouse radio, the sender of which stood on a tripod on a table in front of the speakers. Even the noise of the passing street cars and whirring auto engines could be heard by the radio listeners-in as far away as Hudson Bay or Mexico, the Atlantic and the Pacific oceans.

The handsome bronze tablet is fastened to the front wall of the Calvary Church at the Walnut street corner, and bears a bas relief of the North American continent, with radio waves shooting out to all points of the compass.

The dedication followed the regular church service. In his sermon Dr. Van Etten referred to the dedication to follow and remarked upon the fact that the services broadcast have reached all kinds of people of almost all denominations. The sensitive conductor of the KDKA wireless sends out even the faintest strains of the choir and organ.

The memorial tablet is 30x24 inches. On it is the following inscription: "January 2, 1921, from Calvary Church, for the first time in history a church service was broadcast by radio telephone by the Westinghouse Electric and Manufacturing Company. This tablet

Rev. Van Etten, who has preached nearly every Sunday to his radio congregation since his first sermon in 1921, declares the radio possibilities for the clergy to do good work are boundless.

Possibilities Great.

"Mission churches without a parson may have the best religious services," he said. "Hospital wards have been equipped. Our parish is doing organized work by wireless. We want several receiving sets. The church home hears our services through one of the sets we won. The invalids of the parish are enjoying the use of two others. Outside our own parish family groups all over the country gather at the library table for a wireless Sunday night worship. Thousands can have services who never had the chance before. I feel radio is a wonderful boon to the church. Like the men who sent the first cable message through the ocean we should exclaim reverently of radio: 'What hath God wrought!'"

John Frazier, superintendent of the telephone department of the Westinghouse Electric and Manufacturing Company, has contributed largely to the successful transmission of services from station KDKA at East Pittsburgh, as under his supervisoin the radio pick-up sets are installed in various churches and other assembly places in Pitts-

Pittsburgh Press
Sept. 12, 1923

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FIRST JOBS OF BIG MEN

By Philip F. Nowlan.

WAS AN INSTRUCTOR.

There's an old saying that "those who can, do, and those who can't, teach." Its not a true saying.

There is, for instance, the youngster who graduated from the Worcester Polytechnic institute a number of years ago, a serious, studious chap of the type who is often known among lighter-headed students as a "greasy grind."

He had worked his way through on a scholarship and at the end of his course stayed on at the institute as an instructor in electrical engineering. He held this first job of his, at a small salary, for a year. His next was with the Thompson Houston Co., and then before long he got himself a job as an apprentice in the shops of the Westinghouse Electric & Manufacturing Co. in Pittsburgh. This gave him scope for his talents, which lay in the direction of experimentation, and led ultimately to his contributing probably as much as any other man to making radio broadcasting the big business enterprise that it is today with its attendant heavy sales of radio reception equipment.

He is Harry P. Davis, vice president of the Westinghouse Co.

Re-Broadcasting of Radio One Of Biggest Steps Ever Taken In That Interesting Science

tion KFKX was born. At that time like most infants, the station was a nonentity, possessing neither name nor distinction.

The present station was erected at Hastings after preliminary tests had determined it to be a logical point for the re-transmission of KDKA's programs. Situated 43 miles from the geographic center of the United States and in a level country removed from mineral deposits and other interference, Hastings held great promise for the experiment; a promise which has been more than fulfilled.

J. C. Stroebel and Frank Falknar, two young radio engineers who had done excellent work on previous radio assignments in this country and in South America were dispatched to Hastings and the experiments begun

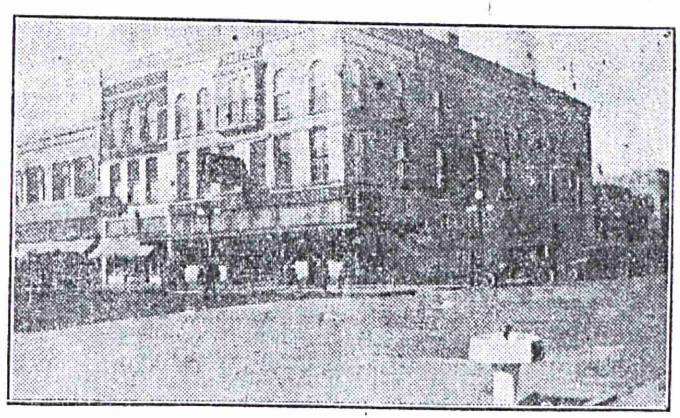
On Thursday, November 15, 1923 radio fans all over the North American Continent were amazed to receive a program of remarkable clarity and power from station KFKX, a station not formerly encountered and not appearing on any of the radio maps The program sent out was not a rebroadcast; but merely a local program broadcasted as a test of the station's range.

On Friday, letters and telegrams began to pour in from all points of the compass, bearing congratulations or the excellence of the program and the amazing clearness with which it was received. One thousand two hundred

ing favorably with the most noted studio of the Country.

Later when a schedule can be arranged, programs from KDKA at East Pittsburgh will be rebroadcasted on regular nights giving the regular listeners of KFKX the novel experience of hearing programs from two cities, over a thousand miles apart, coming from the same station.

A significant point to remember in this connection is that station KDKA at the East Pittsburgh end of the relay, was the first station in the world to broadcast a radio program. Station KFKX at Hastings, was the first station in the world to rebroadcast a radio program. The combination of first broadcaster and first re-broadcaster presages still greater radio development in the near future.



Gaston music store, Hastings, Nebr. home of the first successful re-broadcasting studio.

So many requests have been received for a description of the station that the following facts have been released thru the Westinghouse representative at Hastings:

KFKX Standard Wave length—286 meters.

Receiving wave length for relay—96 meters.

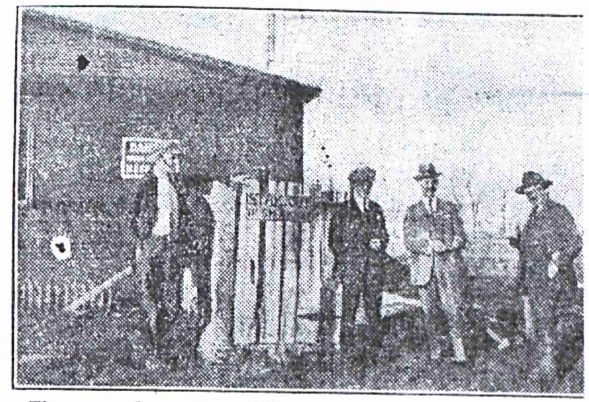
Antennae length—35 feet.

Transmitting set — Three panels consisting of a rectifier panel, a modulator panel and oscillator panel.

The function of the Rectifier panel is to convert the high voltage D. C. current received on the antennae to high voltage D. C. for the plate circuit. The function of the modulator is to impress the voice frequency on the high voltage D. C. current before it goes to the oscillator. Finally the oscillator converts the high voltage D. C. currents into radio frequency in which form it is delivered to the antenna.

It will be noted that the antenna at Hastings is much smaller than the antenna usually required for ordinary broadcasting. Care is taken to guard against any antenna vibration and for this purpose the antennae, including the flat top and counterpoise, are stretched between cross-arms rigidly attached to stead of the more comm spreader.

That, as briefly as it c is the story of KFKX at

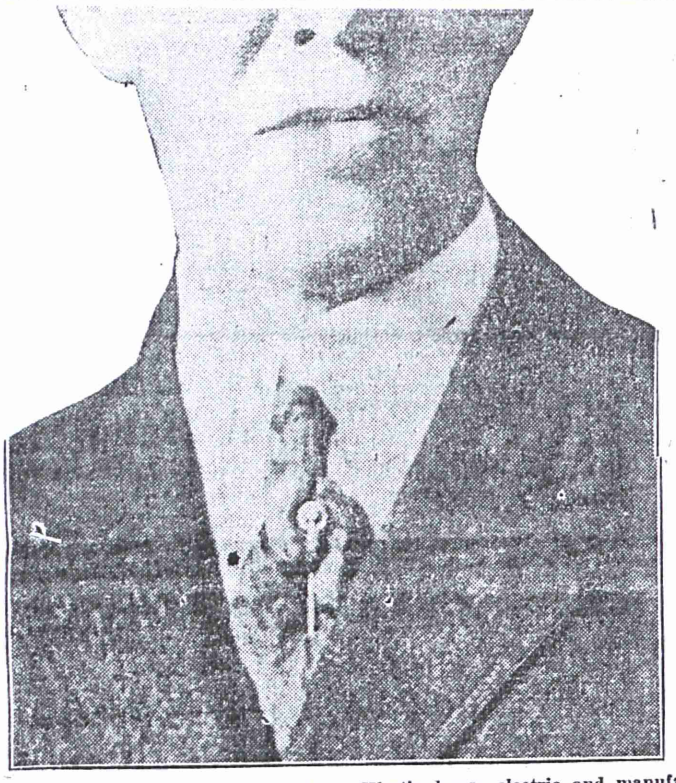


The men who performed the successful experiment. Left t A. Barber, Hastings, Nebr., electrician; Frank Falkner, Westing engineer; W. S. Watson, city water and light commissioner; J. Westinghouse radio, engineer.

the description of its Whatever may be its fate, sure, KFKX and Hasting linked in radio history to greatest developments of

Diabetes occurs about tw in males as in the opposit more frequently in blond dark completed people.

Helium costs $100 per 1 feet.



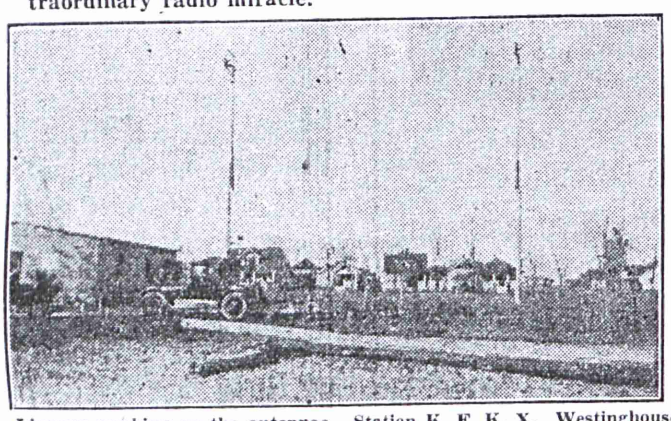
H. P. Davis, vice-president of the Westinghouse electric and manufacturing company East Pittsburgh, Pa. The "father of radio broadcasting," who instituted the first radio broadcasting unit at East Pittsburgh, and who conceived the rebroadcasting idea at K. F. K. X.

(First exclusive article by William E. Barrett, Special Representative at Hastings, Nebraska, of the Pueblo Star-Journal.)

A short time ago, Shelby, Montana, leapt into prominence in the papers of the nation and echoed thru a million conversations. Today, on the plains of the middle west another city is making to world-wide fame.

Hastings was, a short time ago, just a thriving town; well-known within the envirous of its own state but unnnoticed by the world at large. Today, Hastings, Nebraska, is the scene of the biggest step forward in radio development since the starting of broadcasting.

A few days ago the world received a jolt when the announcement came out of the Nebraska plains that a radio program had been successfully rebroadcasted at a standard wave by a station receiving in a short, of high frequency wave. Station KFKX ostensibly an experimental station maintained at Hastings, Nebraska, by the Westinghouse Electric & Manufacturing company was the station to accomplish this extraordinary radio miracle.

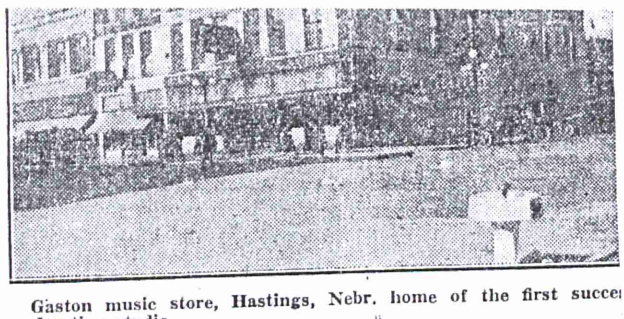


Linemen working on the antennae. Station K. F. K. X. Westinghouse experimental station, Hastings, Nebr.

The full significance of the feat is not realized until one stops to consider the possibilities opened up. A program may now be sent out from station KDKA at East Pittsburgh on two waves simultaneously; 326 meters, their standard wave length, and 96 meters, the high [illegible] short wave may then be received at KFKX, Hastings, and retransmitted at 286 meters, the standard wave of that station; the effect being that of applying a "booster" to the power bringing the Eastern station into the homes farthest West.

Building upon the possibilities, one can readily see that it is now possible to make a single program circle the globe and sound almost simultaneously in every part of the world Music is said to speak a universal language. Now the way is opened for American music to speak to the world. With another relay station in California ready to rebroadcast, KFKX could follow the same method as KDKA and do its rebroadcasting in two waves; the shorter one to be picked up and again sent out. This according to the Westinghouse engineers, could be accomplished without sacrificing clarity or tone value. In fact, so successful have the experiments proven, it would be impossible to sell in Illinois, half way between KDKA and KFKX, which was the broadcast and which the rebroadcast

The perfection of this latest radio [illegible] was not the result of an accidental discovery nor a spare-time accomplishment; it was the climax of long months of untiring experiment on the part of a staff of radio engineers. The idea of rebroadcasting was first conceived in the brain of H. P Davis, Vice President, of the Westinghouse Company, who has ben styled "The Father of Radio Broadcasting," because of his part in the launching of KDKA, the first broadcasting station in the World. As he has always done in the past [illegible]



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On Friday, letters and telegrams began to pour in from all points of the compass, bearing congratulations or the excellence of the program and the amazing clearness with which it was received. One thousand, two hundred and fourteen communications were received from all over the United States every state in the Union being represented. Then Canadian mail came in and the total ran up 53 more communications. Lastly a letter came from Chihauhua, Mexico, and the whole North American continent was accounted for.

Hastings was made.

The results, gratifying as they were however, did not thrill the hard-working engineers at the station nor their confreres at East Pittsburgh. The big task lay ahead of them; the work to which they had dedicated months of endeavor.

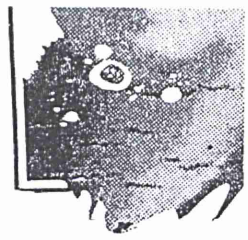
On Tuesday, November 20th, 1923, their efforts were rewarded and the first successful rebroadcast accomplished. No call letters were announced and no inkling given to the listening radio fans that they were listening to a rebroaddcasted program. The time was not ripe for that. All that was desired by the men behind the micraphone was the assurance that it could be done. With that assurance they could lay their plans for the future.

When word was received over long distance, from Westinghouse men who had listened in, that the program had been clearly received on the 286 meter wave of the new station, an impromptu celebration was held and the announcement flashed to the press that another miracle had been accomplished in the world of radio—a miracle which ushered in a new era in the art of talking to the world.

The Westinghouse company is not ready at present to state whether or not a permanent broadcasting station will be maintained at Hastings. KFKX was designed to be an experimental station and with its destiny fulfilled the inclination of the company would be to abandon the location. The broadcasting popularity of the station, however, which was evidenced by the replies received from the few programs thus far broadcasted has led to serious consideration on the part of officials regarding the advisability of continuing the station.

For the present, arrangements have been made whereby local programs will be broadcasted at 9:15 Central time every Monday and Thursday from the studio of the Gaston Music and Furniture company at Hastings. This is a splendid studio fitted up in [illegible]oughly modern style and compar[illegible]

station in the world to rebroa radio program. The combina first broadcaster and first r



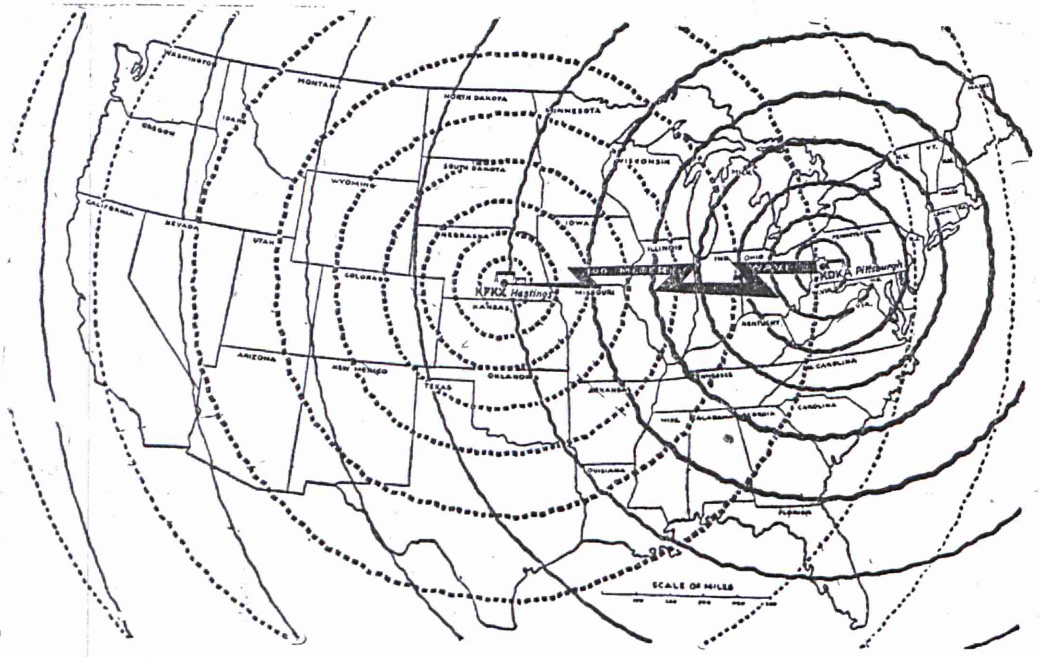
MRS. DAVID ALLEN C

Allen Campbell, vice presi National Federation of M and chairman of the co music of the National Women.

One alternative, in th Mrs. Campbell, is action organi[illegible]

RADIO BROADCASTING NEWS

Repeated Radio Concerts Herald New Era Of Radio Broadcasting; Westinghouse Station Is Pioneer



The means by which radio repeating is accomplished is illustrated in the diagram above. The heavy continuous lines indicate the concert broadcasted from Westinghouse station KDKA, at East Pittsburg. The arrow shows the concert being sento Hastings, Nebraska, on the low wavelength and the dotted lines indicate the repeated concert broadcasted from Hastings.

"Radio broadcasting repeating" is the newest phrase in the English language. It came into general use when the Westinghouse Electric and Manufacturing company announced the opening of its new station KFKX at Hastigs, Nebraska, November 21, 1923, which will be operated as a repeatig station.

Radio broadcasting repeating is, however, more than a phrase, because it opens a new era in radio broadcasting.

Radio programs originating in important centers may now be received in isolated and far distant points with the same ease that they are received in the immediate vicinity of the broadcasting station originating the program.

This is possible in the present instance in the case of KDKA of Pittsburg, Pa, and KFKX at Hastings, Nebraska. KDKA broadcasts the original program, which is repeated with equal strength at KFKX, thus doubling the rangs in which the reception of the original program was possible.

The methods used by a radio repeating station in broadcasting are much the same as those employed in the distribution of electric current with special apparatus, and repeated either at the same high frequency for longer transmission to another repeating station, or it is rebroadcast at a lower frequency which will permit its reception on existing receiving sets, and the repeated program serves an entirely new area, greatly increasing the numbers of listeners reached.

Owing to the speed at which radio waves travel, which is the speed of light, the repeated broadcast is simultaneous with the original broadcast and the listener is wholly unaware that he is hearing a repeated program.

It is of more than ordinary interest that the Westinghouse Electric and Manufacturing company, which was the pioneer in radio broadcasting, should also take the initiative in this most epochal step. Radio repeating was suggested and recommended by H. P. Davis, vice president of the Westinghouse Electric and Manufacturing company, nearly a year and a half ago. He stated at that time that he was convinced that the solution of the radio broadcasting problem lay in the introduction of a few centrally located broadcasting stations, which would serve many low powered [illegible] casting stations so located as to obtain the best of program material, would be able to supply the entire continent. These stations should have great power and be non-interfering, and thus be able to cover a great radius, transmitting their programs at high frequency. At distance points should also be repeating stations, of great power, available simply to repeat the original broadcast at the same high frequency.

simultaneously although the pu[illegible] hears only two of them. Thus radio repeating actually acco[illegible] plished.

There is no limit to the range of repeated concerts. KFKX could, just as easily as KDKA, repeat the concert to another repeater located in another section of the country. In fact with enough repeating stations, one central broadcaster could service the entire world.

Frank Conrad, assistant chief engineer of the Westinghouse Electric and Manufacturing company, who developed the high frequency transmitting and sending apparatus and so made radio repeating possible.

TO-DAY'S RADIO PROGRAM

THURSDAY, DECEMBER 6
(Eastern Standard Time)
WJZ, New York (660 kilocycles)
(455 meters)

3 p. m.—Christmas music by the St Cecile quartet, from the rotunda of the Stewart building; Homer Burress and De Los Becker, tenors; Alvah Nichols and James Thomas, basses.
5:15 p. m.—Dollye Howard, soprano.
4:40 p. m.—Alexander James, tenor.
5 p. m.—"Voice Hygiene," by Dr John Levbarg.
5:15 p. m.—"Sidelights on Egypt," by Mrs Grace Thompson Seton.
5:30 p. m.—Closing reports of the New York State Department of Farms and Markets; farm and home reports; closing quotations of the New York Stock Exchange; foreign exchange quotations; news.
7 p. m.—"Santa Claus Stories," by Burr McIntosh.
7:30 p. m.—Sadie Tresonthick, soprano.
7:45 p. m.—Literary program.
8 p. m.—Sadie Tresonthick, soprano.
8:15 p. m.—Dance program by Irving Selzer and his orchestra.
9 p. m.—Dinner of the New York Railway club, from the Hotel Commodore; speeches by Professor Meyer, of Princeton univ[illegible] sity, and Senator Ford.
10:30 p. m.—Dance prog[illegible] Hotel Commodore

WJY, New Yo[illegible]

7:30 p

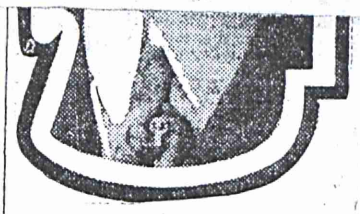
end it can be transformed in a way that makes it suitable for us at the receiving end.

It is practically the same thing with radio repeating. A central station broadcasts the original program. This is sent out on two frequencies—one frequency is such that radio receivers in general use may receive the broadcast; the other frequency is very much higher—so that that radio receivers of the type now in use cannot receive it. This is a necessary and desirable feature as it is necessary that the high frequency transmitting wave must be quiet in order that the repeated program may not be blurred by extraneous noises such as are caused by the attempt to tune in with regenerative receiving sets. This high frequency carries the program to the distant repeating station where it is received

Manufacturing company has followed this suggestion and the scheme seems to be the practical solution to the broadcasting problem, as evidenced by the reception given by the public to the new Hastings, Nebraska, station.

This station repeats the broadcasts sent from the Westinghouse station KDKA at East Pittsburg, Pennsylvania, the world's pioneer. After the first program which KFKX repeated from KDKA, letters were received from every part of the continent, telling of the wonderful results and reception from this new station. Thus KDKA through KFKX has greatly increased its audience, and has brought radio to a vastly greater number of people.

As Mr Davis predicted, radio repeating may be the solution of the broadcasting problem. A few broad-



H. P. Davis, vice president of the Westinghouse Electric and Manufacturing company.

By this means a blanket of high frequency radiations will be made to cover the whole country. Then in each community it would be possible to locate a low powered and repeating station which could be used to repeat the selected program for those living within its range. These stations can also be used to furnish local color for the immediate vicinity.

The Hastings station is not a low powered repeater. On the contrary, it has the same power, or about the same power, as KDKA, but it was installed to demonstrate the principle of repeating, and can be used to repeat at a high frequency which is inaudible to the ordinary receiving set, or at a lower frequency, name 1050 kilocycles, or 286 meters, which permits it to be heard by the ordinary receiving sets.

In actual operation KDKA and KFKX operate in the following manner. KDKA has two transmitters. One of the transmitters broadcasts on 960 kilocycles frequency. These are the broadcasts which KDKA'S audience has been hearing for the past three years. The other transmitter broadcasts the same concert simultaneously on 3200 kilocycles frequency. This broadcast is the one received at KFKX. A special receiver is used which is connected by a telephone line to the radid transmitter where it is again broadcast, but this time on 1050 kilocycles frequency. There are three transmitters broadcasting

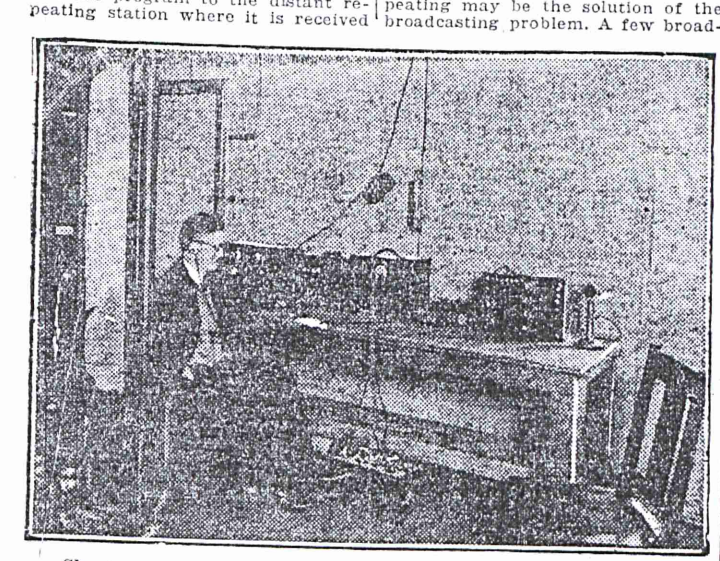
company chorus of four voices.

WEAF, New York (610 kilocycles) (492 meters)

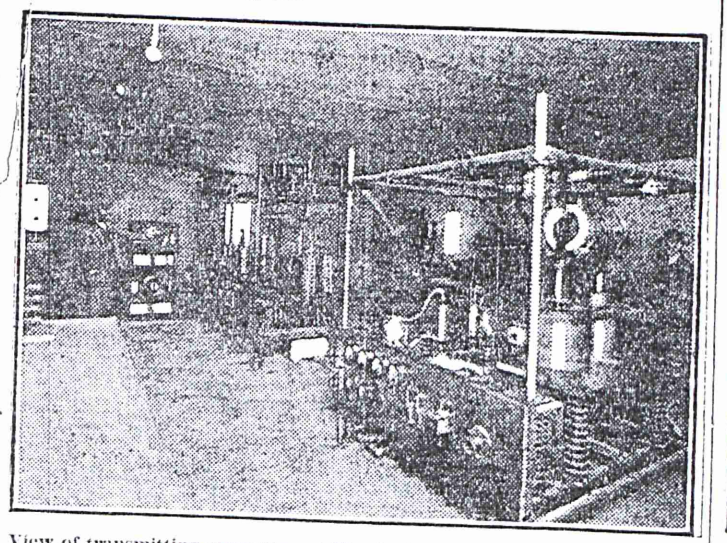
11:20 a. m.—Musical program.
11:30 a. m.—"Care of the Hands," by Mrs Auralee Bloom.
11:50 a. m.—Market reports.
4 p. m.—Muriel H. Wilson, lyric soprano.
4:15 p. m.—Maurice L. Seifstein blind tenor.
4:35 p. m.—Muriel H. Wilson, lyric soprano.
5 p. m.—Christmas program for children.
7 p. m.—Interdenominational services under the auspices of the New York Federation of Churches. Address by the Rev Irving H. Berg. Arthur Billings Hunt, baritone, and Anne B. Tyndall soprano.
7:30 p. m.—Sport talk by Thornton Fisher.
8:40 p. m.—Edna Fields, mezzo-contralto.
8:10 p. m.—Aida Quartet.
8:40 p. m.—Eda Fields, mezzo-contralto.
8:50 p. m.—Reading of manuscript story by William L. Roberts.
8 p. m.—William Sweeney, baritone.
8:15 p. m.—Music by the "California Ramblers."
9:30 p. m.—Aida Quartet.
9:45 p. m. — Margaret [illegible] mezzo-soprano, and Jose [illegible] querriere, tenor.
10 p. m.—William Frie[illegible] pianist.
10:15 p. m.—William Swe[illegible] baritone.
10:30 p. m.—Margaret [illegible] mezzo-soprano, and Jose Dela[illegible] diere, tenor.
10:45 p. m.—William Friedm[illegible] pianist.
11 p. m. to midnight— Vin[illegible] Lopez orchestra.

WOR, Newark N. J. (740 kilocycles) (405 meters)

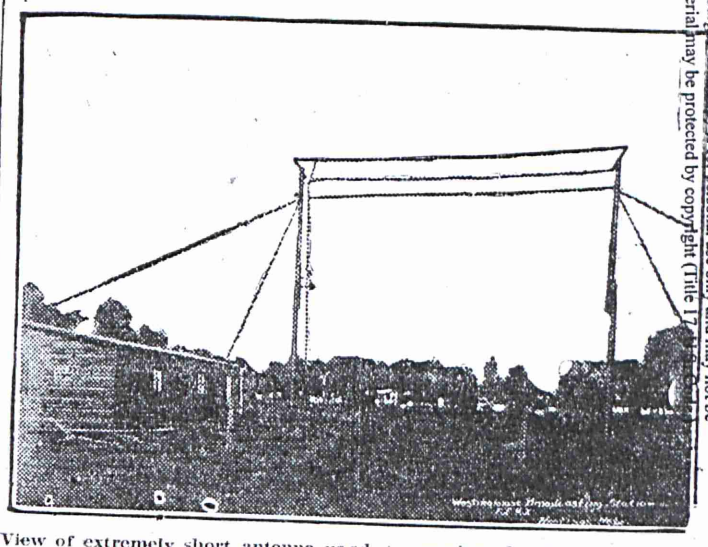
2:30 p. m.—Soprano solos by E. Porth.
2:45 p. m.— Bertha Luck, contralto.
3 p. m.—"The Experience of a Magazine Writer," by Ida M. [illegible] bell.



Short wave or high frequency receiver at Hastings, Nebraska, used to receive the high frequency broadcasts from Westinghouse station KDKA at East Pittsburg, Pa.



View of transmitting apparatus at Westinghouse station KFKX, at Hastings, Nebraska, the first radio repeating station in the world.



View of extremely short antenna used to receive the high frequency broadcasts at Westinghouse station, KFKX, at Hastings, Nebraska.

Manchester Guardian
Manchester, England
Jan. 2, 1922.

PITTSBURG SPEAKS AGAIN.

THIS MORNING'S SUCCESS.

A VOICE RECOGNISED BY RELATIVES.

REMARKABLE MANCHESTER EXPERIENCE.

Pittsburg, Pa., spoke Manchester again in the early hours of this morning.

On this occasion Metropolitan Vickers were the receivers. For several months Mr. A. P. Fleming, head of their research department, has been experimenting in broadcatching messages from K.D.K.A., the Pittsburg, Pa., station, which, it should be explained, is none other than an American Westinghouse station, and, as a matter of fact, was the first broadcasting station in the world. Mr. Fleming, for weeks, has been getting messages on the 100-metre wave length from Pittsburg. The quality of the transmissions had been steadily improving during that time, and some days ago it was announced that the Metropolitan-Vickers would re-broadcast the Pittsburg programme on New Year's Eve. When that announcement was made it was not anticipated that the B.B.C. were going to have such success as they had on Friday and Saturday night in intercepting the Pittsburg programme.

Mr. Fleming's house at Hale might almost be described as an offshoot of Metropolitan-Vickers. Here an indoor aerial had been set up to receive the Pittsburg programme. Alongside were many amplifiers capable of magnifying the Pittsburg sound waves millions of times. Control levers were in position to retransmit the sound waves over a land wire to the Old Trafford station, and from thence they were to be re-broadcasted all over the country. A party of newspaper men and a few friends of Mr. Fleming waited until midnight for 2 Z.Y., the Manchester B.B.C. station, to close down. That was the moment fixed for receiving the Pittsburg programme. At 11 30 we listened in, just to test for "atmospherics." They were bad. There was a confused noise and nothing more, varying from low mutterings to wild shrieks. It improved a little as midnight approached. Overlaid though they were by the prevailing discordance, one could perceive Morse signals coming ever more clearly to the surface.

Someone suggested that ships at sea were signalling New Year messages.

The First Message.

Midnight had hardly struck when faint but fairly clear, and only occasionally interrupted by the Morse and "atmospherics," one heard the strains of "God save the King." Immediately one felt very kindly disposed towards the good people of Pittsburg, Pa. What followed? Our dear, sentimental friend, "The Lost Chord," heard as you might hear the band on a liner in a high wind—but unmistakably "The Lost Chord." Next the voice of Mr. H. P. Davies, vice president of the Westinghouse, came through with tolerable clearness. He, in Pittsburg, Pa., was wishing us at Metropolitan-Vickers "A Happy New Year."

Again the "atmospherics" asserted themselves. Now we were largely guessing. Was it an orchestral work or a violin solo? No one could be sure. A man was making a speech. What about we had no idea, save that there was certainly "uplift" in his voice.

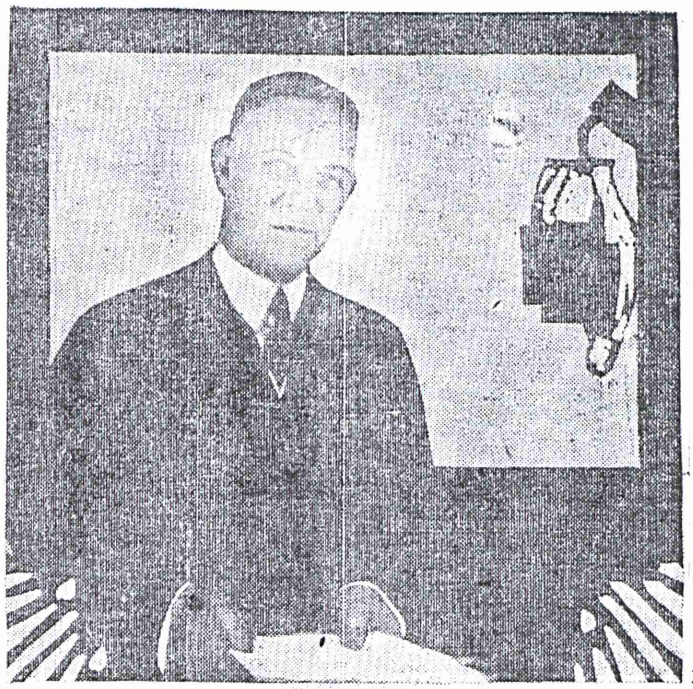
Once more it cleared, and now we were listening beyond any doubt to a lady telling American children a fairy story before they were put to bed. Yet it was one o'clock here. We caught phrases about "a golden bowl" and "by and by they came to a gate" and "he didn't even say good-night." The drift of the story we lost, but it was quite thrilling to get even such scattered observations as these.

But the most wonderful thing was yet to come. Among the people "listening-in" in this room of Mr. Fleming's were the mother and sister of Mr. S. J. Nightingale. He is a member of the Metropolitan-Vickers staff, and he is putting in twelve months at the Westinghouse works, Pittsburg. Across three thousand miles Mrs. Nightingale heard this: "Mr. S. J. Nightingale will now sing you three songs." The announcement naturally threw Mrs. and Miss Nightingale into some excitement. Suddenly there swelled up out of the void a man's voice. It was full-bodied and musical, but the words one could not catch.

Mrs. Nightingale's countenance told plainly enough that she had recognised the voice. What was more, she knew the song. The tune was clear—at least to her. "Yes," she said when it was over. "It was 'Summer Time on Bredon Hill.' My son often sings it."

This last song was the only thing re-broadcasted up to 1 15. It was not felt that the earlier stuff was of the consistent clearness which warranted re-transmission.

Sends Greetings to World



H. P. DAVIS

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New Year Greetings Broadcast to World From KDKA Station

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The occasion was the first time that such greetings were extended to the peoples of all the world and to H. P. Davis, vice president of the Westinghouse Company, and recognized everywhere as "the father of radio broadcasting," was assigned the honor of uttering the first New Year's message heard simultaneously around the world.

Mr. Davis' message follows:

"To the people of Great Britain on this New Year's eve, I send greetings from America and express to you the wish of every American—that Great Britain and her European neighbors may enjoy a prosperous, peaceful and progressive New Year.

"Wonderful for World."

"That the means of communication have been greatly advanced during the past year is fitly shown by the fact that events and your every day happenings known to us.

"A year ago such an achievement seemed beyond belief. With such advancement in the radio art an established fact, no man dare predict what developments will take place before another New Year.

"It is a wonderful thing for the world—this achievement which enables the peoples of one continent to "listen in on" the activities of the peoples of another continent—for the friendship of nations is founded on closer understanding among the various peoples and in no way can different nations better understand each other and become more closely in touch with each other than by improved means of rapid and accurate communication.

Cable of Greetings.

"It is also fitting that Westinghouse station KDKA, the pioneer broadcasting station of the world, should be the first station to develop a means for the repeating of its programs to you, the peoples of other continents, for it was here, and by this station, from which I am now sending this message that radio broadcasting was first undertaken. This feat is only another progressive step in the development of this great utility.

"On behalf of the people of America it is my great privilege, therefore, for the first time in history, by means of the spoken word, to speak directly to you the wish for a happy and prosperous New Year."

The following cablegram was received last night by the Westinghouse company from A. P. M. Fleming, C. B. E., manager of the research department of the Metropolitan-Vickers Electrical [illegible] England:

LAY BROADCASTING TO WATCH DISPUTE

Argument Between Two Men Direct Cause of Radio as Known Today

FAIRY TALE OF SCIENCE

An argument between two Pittsburgh men over whose watch told the correct time, according to Frank Conrad, of the Westinghouse Company, is the direct cause for radio broadcasting as we know it now.

It was that argument that made one of the men set up an amateur station, which his boss made him shut down a little later on.

Though apparently disconnected and paradoxical, the facts are as stated, and the story of the beginning of broadcasting is one of those fairy tales of science which prove that the future result can never be foretold when something new is started.

The man who won the watch argument by establishing an amateur station was Mr. Conrad, who is now assistant chief engineer of the Westinghouse Electric and Manufacturing Company.

In the early days when wireless was just beginning to spread, and when a few amateurs had begun to wind funny-looking coils and cuss at coherers that wouldn't decohere, Mr. Conrad and another official of the Westinghouse Company compared watches after luncheon to see if it was time to go back to work. Their watches differed.

Now the other man's watch was brand-new and he was confident it was right. Mr. Conrad's watch was old, but he had been comparing it daily with the Westinghouse master clock, which was regulated by the old system of Western Union time service.

Mr. Conrad had noticed variations in this time service, that he couldn't make any one believe. He had no way to prove his theory that it did vary—that there was sometimes a "lag" in the mechanical process somewhere—until this argument about the watches made him suddenly remember that the naval station at Arlington, Va., had inaugurated a system for sending out time signals by radio and he knew there would be no lag or delay in such signals.

So he figured out a crude way to make adequate receiving apparatus, and soon had he erected an aerial and put up his coils and stuff over a garage at his home.

That started him. Like every one else who gets bitten by the radio microbe, he quickly contracted a hopelessly incurable case, and the first thing he knew—after proving his point about the old wire time service—he was figuring on transmitting apparatus and was working one of the very few amateur transmitters in the United States.

Then came the war, and the Westinghouse Company found itself assigned to a vast amount of radio work. Naturally it was turned over to Mr. Conrad, who, by that time, had become an expert and had taken out a number of patents.

After the war, he began experimenting in the transmission of music by radio. He made a practice of sending out phonograph-record music through the ether and some of the big Pittsburgh stores, which had installed amateur radio departments, got into the habit of advertising Mr. Conrad's musical evenings as an inducement to amateurs to come in and buy apparatus.

Then one day when Mr. Conrad went to his office, he was called by Harry Phillips Davis, vice president of the Westinghouse Company.

"Frank," said Mr. Davis, "I'm going to close your radio station."

Mr. Davis had come into his office that morning in September, 1920, with an idea. The idea had come to him while reading the advertisement in his evening paper.

In a corner of a full-page ad, he came across the words: "Mr. Conrad will send out phonograph music this evening." This advertisement was in the interest of the store's amateur radio department.

Mr. Davis could not forget the idea. He was struck with the fact that the radiophone fundamentally did not [illegible] itself only to private communica[illegible] but that it had a universal field [illegible] usefulness and that through it one c[illegible] communicate with hundreds, thousa[illegible] or millions.

Why confine one's audience to [illegible] small portion of the country? [illegible] not build a big station and let ev[illegible] one who wanted to hear? Why [illegible] make radio broadcasting a public se[illegible]ice?

Mr. Davis was so struck with [illegible] idea of a public broadcasting se[illegible] that the first thing he said to [illegible] secretary on entering his office [illegible] next morning was, "Ask Frank [illegible] come in."

And Mr. Conrad, having been t[illegible] so abruptly with his chief's statem[illegible] could only listen to what followed.

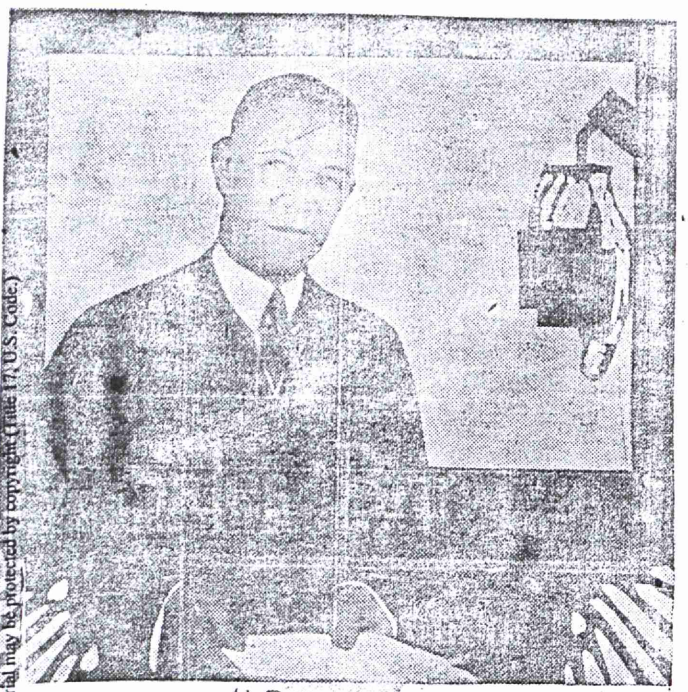
"Frank, my idea is that you s[illegible] sending from your station and we [illegible] start a regular service from our exp[illegible]mental station here at East Pittsbur[illegible] We can arrange for a suitable wa[illegible] length, and I believe that if we [illegible] this it will be the beginning of a ra[illegible] broadcasting service which seems [illegible] me to have wonderful possibilities."

The conference with Mr. Con[illegible] lasted a short time, and Mr. Da[illegible] called other conferences before act[illegible] work on the broadcasting started. [illegible] was not until November 11, 19[illegible] that the station was formally ope[illegible] to send out election returns and u[illegible] "KDKA," the first broadcasting [illegible] cense issued by Uncle Sam.

The remainder of the history [illegible] KDKA is now common prope[illegible] Every one, almost, now knows [illegible] there are more than 500 broadcast[illegible] stations in the United States and t[illegible] the radio audience numbers into m[illegible]lions each night.

Phila. Public Ledger
Nov. 11, 1925

Sends Greetings to World



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udience last night. Beatrice s Laura Atherton, the self-centered nother, has dramatic moments with ane Atherton, the daughter, enacted y Dorothy Sanos.

Whitford Kane is a pleasing character Thomas, the Atherton family servant, id Frederick Weber, as the moon-mad idge Atherton, handles well a difficult le. Others in the cast are William oyd as Major John Bannister, Jane's yer; Albert Phillips, as Dr. Wetherell, e family doctor and friend, and Senia rel as Walter Higgs, the major's aide.

The plot brings out the selfishness of ura Atherton who is aroused at her ughter, Jane's failure to consult her out her engagement to Major Banister. ien Jane refuses to break the enement, her mother reveals the curse the Athertons, the children of the on. Judge Atherton, moon-mad, nds his time gazing at that planet, ng all thought of the life about him. e's father and her brother took their s on moonlight nights. This revelaaffects Jane's mind and she beies moon-crazed. She flies off to go the moon with the major, and the plane falls into the sea.

GAYETY—"Happy Days."

he show in the Gayety this week is ed by Hurtig & Seamon, well wn burlesque producers. The enterment is tagged "Happy Days," and ch of it is of a lively character t recalls the days before nearly s. The chief funmakers are Frank phy, the tramp specialist, and old Ward, who has been on the stage e Grant was a cadet at West Point. y were assisted by Kitty Glasco, leading vocalist; Fay Tunis, a rtly dressed girl who personates nch characters; Mildred Campbell, dys Darling, soubret; Mabel Mc-

New Year Greetings Broadcast to World From KDKA Station

Davis Delivers Message to All Nations First Time.

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"To the people of Great Britain on this New Year's eve, I send greetings from America and express to you the wish of every American—that Great Britain and her European neighbors may enjoy a prosperous, peaceful and progressive New Year.

"Wonderful for World."

"That the means of communication have been greatly advanced during the past year is fitly shown by the fact that I am able to speak directly to you, the great masses of population of other nations, across an intervening ocean. This achievement will untimately result in making known to you America's daily events and your every day happenings known to us.

"A year ago such an achievement seemed beyond belief. With such advancement in the radio art an established fact, no man dare predict what developments will take place before another New Year.

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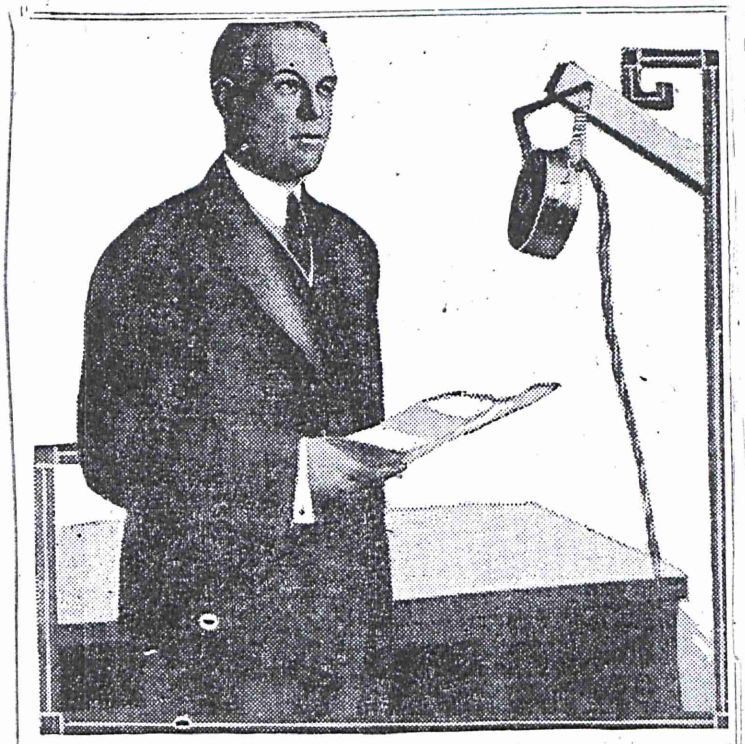
"On behalf of the people of America, it is my great privilege, therefore, for the first time in history, by means of the spoken word, to speak directly to you the wish for a happy and prosperous New Year."

The following cablegram was received last night by the Westinghouse company from A. P. M. Fleming, C. B. E., manager of the research department of the Metropolitan-Vickers Electrical Company, Manchester, England:

"Repeating KDKA has aroused widespread interest and press comment. Please convey by announcement New

Waterbury Evening Democrat
January 24, 1924



H. P. Davis, Vice President, Westinghouse Electric and Manufacturing Company, the Father of Broadcasting.

It has been stated by many eminent authorities that radio is the greatest boon of the present century and it is fact that the usefulness of radio is only limited by the ingenuity of those who use it.

No one can claim, however, that the Westinghouse Electric & Manufacturing company, of East Pittsburg, Pa, which operates the pioneer broadcaster of the world KDKA and also three other stations, KYW at Chicago, WBZ, at Springfield, Mass., and KFKX, the new repeater at Hastings, Neb., is lagging in the race for the new uses of radio.

The latest developement of this company is the repeating of messages across the ocean and from developements of the past month, it has been proved that broadcasts originating from one station can cover almost the entire world through the use of repeating stations. KDKA has covered, with repeaters in action, almost the half of the earth.

KFKX, the new repeating station of the company is located at Hastings, Neb. It repeats the concerts originating at KDKA, in East Pittsburgh, and services the entire western half of the United States, Canada, Mexico, and also a large portion of South America

Then there are the repeating stations located across water.

Through co-operation with station 2A C, of the Metropolitan-Vickers Electrical Company, at Manchester England, the same broadcast which is repeated from KFKX, is also repeated from this English station. However, the entire eight stations of the British Broadcasting Company, are linked together with land lines and the result is that what one station broadcasts the lot can also broadcast providing they desire to. In the case of the Westinghouse broadcasts all the stations of the B. B. C. tie-up in the repeating.

The result of these simultaneous broadcasts is that the peoples of Great Britain and of the countries of the European continent can, all of them, hear this repeated message. Telegrams have been received in America, from residents living in Switzerland, Italy, Belgium and other countries, stating that they were hearing KDKA better than they heard the broadcasts of the British Company. These people did not know that the broadcasts of KDKA were being repeated by the British company and perhaps were deluded into thinking they were hearing more clearly, because of the fact that the messages were originating in America.

The trans-Atlantic repeating of broadcasts is the latest improvement in radio and it was KDKA, the pioneer broadcaster of the world, which was the pioneer in this achievement just as it has been the pioneer in every radio achievement since it was started way back in November, 1920.

Pittsburgh Sun
April 14, 1924

WORLD RADIO BROADCASTING PLAN OUTLINED

Repeating on Short Wave Lengths Proposed by Vice President of Westinghouse.

CENTRAL STATIONS URGED

H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, today made public a plan for world-wide wireless programs combining all the modern engineering achievements of radio transmitting and forecasting the marvelous development radio will make in the next few years.

The plan Mr. Davis proposes makes use of radio repeating, eliminates interference possibilities and shows, how, in the near future, the radio listener will be enabled to hear programs from London, Paris, Tokio, in fact any part of the globe, with the same ease as programs from local stations are now heard.

"Radio repeating when it was first successfully accomplished by the Westinghouse Company, was the outcome of the development of short wave transmitting," Davis said. Short wave transmitting means the sending of radio signals on a wave length of 100 meters or lower. Because this wave length is so low, it is not heard on the ordinary receiver and we shall, therefore, call it the inaudible wave. The ordinary broadcasting wave length band from 230 meters to 600 meters is heard, of course, on the ordinary receiver and we shall term it the audible wave. Inaudible wave transmitting forecasts the following radio development:

CENTRAL STATION.

"Certain well-designed central stations will be located at the world centers. These stations will be equipped to transmit on the audible or the inaudible wave length or both as desired. The audible wave transmitter need not have excessive power, so that its operation will not interfere with distant tuning by adjacent radio receivers, if desired. These transmitters will not need any more power than have the leading stations of the United States today. The inaudible transmitters, however, may be highly powered to give them the ability when necessary to maintain a constant range. As their signals will be transmitted on the inaudible wave length, the power used will not cause interference with receivers.

"There will then be located, at advantageous points, inaudible wave length repeating stations whose sole duty it will be to receive these inaudible waves from the central stations and pass them along. These repeating stations will act as "booster" stations to amplify over and over again the inaudible signals.

"Certain other stations, and there may be as many of these as desired, will be equipped with short wave receivers with which it is possible to pick up the short wave signals and repeat them on a low power audible wave. These stations, which are to serve local districts only, will merely repeat the signals caught on the low wave length and rebroadcast it for the benefit of the listeners in their immediate vicinity. These local broadcasters, therefore, need only a small amount of power. This inter-connected international system will have a dispatching organization to direct how and when the various programs of the central stations will be sent and what stations should stand by to handle the program circuits.

PROGRAM AGENCY.

"Such a system will also need a world-wide and very efficient program collecting organization. This program organization will be operated somewhat in the manner of the great news agencies of today, and will continually be on the search for interesting programs from every point in the world.

"The Westinghouse company has made a good start in the development of the necessary apparatus for the operation of such short wave transmitters and 'booster' stations. KDKA already has an inaudible wave transmitter. KDKA is furnishing programs to the other Westinghouse station located at Hastings, Neb., on the inaudible wave length and this station is, in turn, repeating these programs on the audible wave length for the benefit of the nearby listeners. KDKA is also furnishing programs to the stations of the British company in England on the inaudible wave lengths, which are picked up by special receivers and the signal rebroadcasted on the audible wave lengths for the listeners of Great Britain and continental Europe.

"The plan is practical, therefore, in fact, it is partly in effect. With public encouragement the further development will come in time."

Father of Broadcasting Has Plan

Of Control---Another Public Utility For a Public Service Board

AUTHORITY TO ENFORCE REGULATIONS—LICENSES TO BE HANDED OUT — PUBLIC CLAMOR MAY RESULT FROM FRANCHISE GRABBING — STATIONS TO BE CLASSIFIED—SIGNS "NO BUTTING IN" SUGGESTED—INTERSTATE RADIO NEEDED

By H. P. DAVIS,
Vice President Westinghouse Company.

With the idea in view of greatly expanding the usefulness of radio telephone broadcasting, H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, nationally known as the "Father of Broadcasting," has suggested a plan for the establishment of a national broadcasting service.

Mr. Davis thinks that a regulating body should be formed to control broadcasting. In an interview, he said: "On the assumption that broadcasting, if not already so, will soon develop into a stable public utility, where the public interest would become paramount, it would appear to us as though the regulating machinery should follow the pattern that has been worked out with other utilities, namely, the establishing of a Public Service Commission which, in the case of radio, would be an Interstate Radio Commission, and, therefore, a Federal Commission created by Presidential appointment.

"This Commission should be vested with full power and authority to make regulations and enforce same to the full extent of existing laws.

"All requests for licenses should come to and be approved by this body, and when an application for a license is approved and the license given, it should take on the nature of a franchise which should be enjoyed by the owner so long as he gives the service required. This is important, because a large investment is necessary and in order to encourage the making of the instrument and protecting it afterwards the owner so long as he follows the regulations of this Commission will have assurance

"It appears to us that there must be two classes of broadcasting stations, and as we see it, these two classes ought to be sufficient. First, there will be stations that are national in scope—broadcasting material of national interest, and, second, local stations serving particular districts.

"In the first class, we think there should be a limited number of stations of considerate power with wave lengths arranged so that they will not interfere at any point, and located where program material will always be available. These will be National stations. They should be, if possible, privileged to the greatest extent permissible, so that they telegraph lines, or other means of communication from point to point, for the purpose of picking up interesting features. They should also, insofar as the public policy will permit, be privileged, if necessary, to requisition program features for this public service.

"The national stations can, if it is desired, transmit at two wave lengths, that is, on the present wave lengths of 360 or 400 meters and also on a wave length that can be relayed. The local stations should be given wave bands that will permit existing receiving apparatus to tune in on them, but these wave bands should be separated sufficiently from the National stations so as to have no interference. It is our belief that the shorter wave lengths are desirable for the local stations, as it gives opportunity for more stations with less interference.

"As many of these local stations can be allowed as the discretionary powers of this Commission determine, with the fact of the proper service in view to make them non-interfering. Adjacent stations can be made non-interfering by proper allocation of the wave lengths within the wave band available for this service; these local stations should hold their licenses so long as they give a service satisfactory to their listening public and to the Commission.

"In operating, these local stations would supply features of local interest and in addition would relay programs or parts of programs of the National stations, selecting from the National stations such material as would interest the listeners.

"A plan of this kind can be worked out and would, in our opinion, permit of the widest possible use and development of broadcasting. The service of the local stations would allow crystal set reception of distant National stations through the relaying of their programs by the local station. On the other hand, it would not prevent those having suitable receiving sets, selecting programs at will of such of the National stations as they could receive. The privilege of operating a radio receiving set shall be subject to such rules and restrictions as the Interstate Radio Commission, acting in the interest of the public, may find it desirable to enforce.

"This plan obviously would furnish a service of special importance, and especially for those who cannot afford expensive receiving sets, as it would give them the equivalent of elaborate long distance receiving sets and would place both the National and local services at their com-

1923-24

RADIO BROADCAST

Vol. 4 No. 5 March, 1924

Broadcasting Complete American Programs to All England

How KDKA Programs on Only 94 Meters Were Heard in England Even Over Lowly Crystal Sets. What Broadcast Repeating May Mean

BY W. W. RODGERS

INTERNATIONAL broadcasting, three months ago only an imaginative theory, is now an actual fact, due to the great progress made in relaying or repeating broadcasts, by means of high frequency waves.

Short waves or high frequency broadcasts—both terms have the same meaning—have opened up a new field in broadcasting. The first test completed at the very start of the New Year open up possibilities that promise extremely rapid developments in 1924.

The first complete international repeating of concerts was accomplished by the Westinghouse Electric and Manufacturing Company coöperating with the Metropolitan-Vickers Electric Company at Manchester, England. There is a kind of unusual justice that KDKA, one of the pioneer broadcasting stations should be the first radio station to transmit concerts to England on a thoroughly accurate basis.

Radio moves so swiftly these days that events tread upon the very heels of one another. The transatlantic tests, sponsored by RADIO BROADCAST, the *Wireless World and Radio Review* (London) and the British Broadcasting Company used the old method of transmitting programs. These had hardly been completed to the satisfaction of the world, when this new scientific feat was accomplished and the latter was so much more satisfactory that there was hardly a comparison between the old method and this new method started by the Westinghouse Company. The old method of transatlantic reception, as all readers of RADIO BROADCAST know, is the same as receiving the concerts in the United States. The station trying to reach England sends out advance notices and then on a prearranged night sends its concert. Those on the other side, know the hour the concert will be broadcasted and listen patiently for the signals. Sometimes on favorable nights, the operator equipped with an extremely sensitive receiver will hear fragments of the concert, but he is never certain to get the signals. The drawback to this method is, of course, the fact that only a small minority of the people living in a country can hear these transatlantic signals because it is only the small minority who own high-priced, very sensitive receiving apparatus. The great mass of the people depend upon the one—or two—tube sets—the English call them "valves"—for the reception of the concerts.

No reception is certain by this method. The listener must be ruled by the god of static, and the good or bad genii of "conditions." It is at best a haphazard arrangement.

But now comes the perfection of the short wave, or high frequency broadcasts. The first announcement of the use of high frequency or very short wavelengths came late last year when Station KFKX, the first radio repeating station in the world, was opened at Hastings, Nebraska. This station is near the exact geographical center of the United States for the purpose of repeating the broadcasts of KDKA, at East Pittsburgh, Pa. It was built to bring the concerts of KDKA to the people of the entire country. The normal range of KDKA was greatly increased because of the repeating station, and the people on the West Coast, who heretofore, had not heard that station, except on very sensitive multi-tube sets, began to pick up Pittsburgh with average receivers.

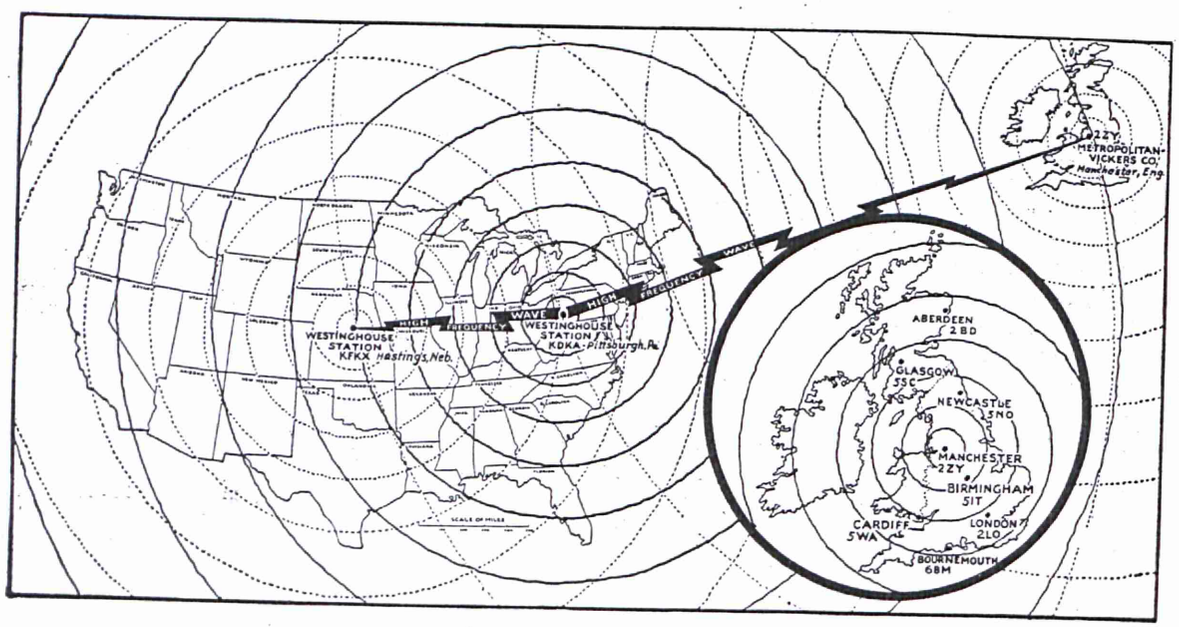
The same principle as used in rebroadcasting from KFKX at Hastings was used in the repeating of concerts in England. The same waves were used as were sent to KFKX, in fact the same transmitter broadcasting its very short waves to the Hastings, Nebraska station simultaneously carried the concert to England for repeating.

All this development in short wave application was accomplished in the last two years' experimenting with these short waves by Frank Conrad, assistant chief engineer of the Westinghouse Company. He had found in his experimenting that the short waves go farther with the same power than do the longer waves and had also made the revolutionary discovery that the short wavelengths were not affected by daylight in nearly the same degree as are the ordinary waves now used in broadcasting. Interference from other stations, of course, at that frequency, did not exist.

Thus, since a medium by means of which broadcasting could be carried on at great distances without interference was at the engineer's command, no barrier opposed international broadcasting. But the proper cooperation from the other side of the Atlantic involved many problems, which though not apparent to the public, took nearly a year to perfect. International broadcasting, brought to a climax with the New Year, really started early in 1922, yet so quietly were the developments made that, at the time of the trans-Atlantic tests last November, few in the broadcast world had even hinted at the possibilities of the repeating station.

HOW THE PLANS WERE QUIETLY MADE

IN THE summer of 1922, Mr. A. P. M. Fleming, manager of the research department of the Metropolitan-Vickers Electrical



HOW KDKA'S 94 METER WAVE TRAVELS

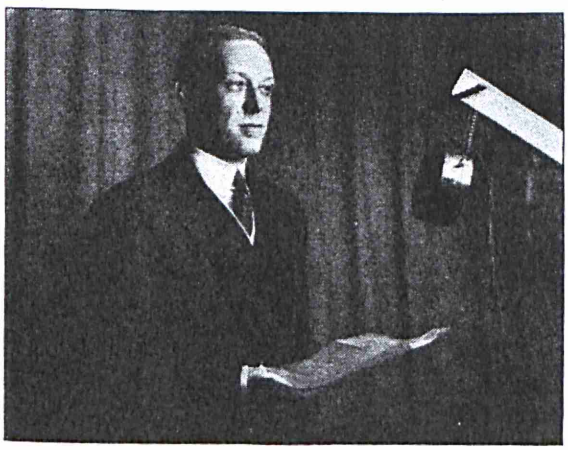
KFKX at Hastings, Nebraska, and the stations of the British Broadcasting Company rebroadcast the short waves with the regular transmitter so that any one with a simple receiver can pick the signals up

Company, visited the engineering department of the Westinghouse Company. During this visit, he talked with Mr. Conrad, Mr. Davis, and others of the officials interested in broadcasting and was told of the short wave tests and how this new medium promised great developments in the radio field. It was in a talk with Mr. Davis that the idea for this international broadcasting was started.

Mr. Fleming told Mr. Davis of the broadcast situation in England at the time and though the possibilities were there, the thought seemed literally and metaphorically a very ethereal subject because while the United States had been very thoroughly "sold" to radio broadcasting, in England the furore was just starting. The public had not caught the enthusiasm. Many of the English newspapers were even severely critical of the future of broadcasting.

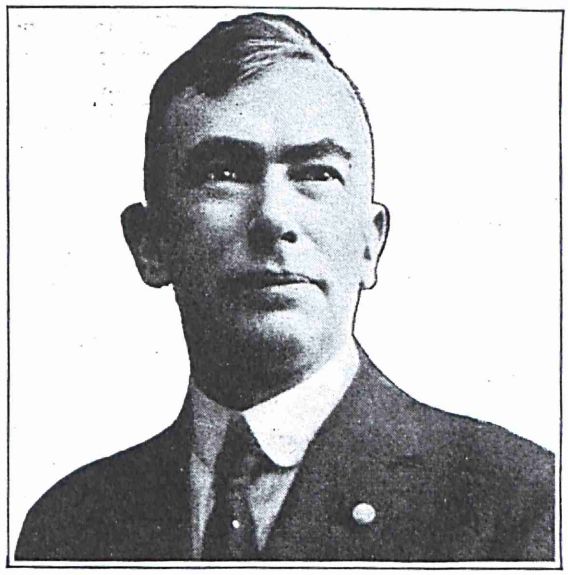
Despite the uncertain broadcasting situation in England, the research department of the Metropolitan-Vickers research laboratories were at the time working on the radio problem and had high hopes for radio broadcasting in England. As a matter of fact, scarcely had Mr. Fleming returned when the radio storm broke and swept over England in the same manner it had swept the United States.

During the later months of organization, the British Broadcasting Company was formed, an organization which has a monopoly on broadcasting in England. The company is an association of manufacturers operating broadcasting stations. Those comprising the association of broadcast stations include the following—2LO, London, 363 meters; 6BM, Bournemouth, 385 meters; 5WA, Cardiff, 353 meters; 5SC, Glasgow, 415 meters; 5IT, Birmingham, 423 meters; 5 NO, Newcastle, 400 meters; 2AC, Manchester, 370 meters; and 2BD, Aberdeen, 495 meters. These stations besides operating independently of each other are also linked by land wire so that in the event of an important happening in one section of the country, the stations can be linked together. Simultaneous broadcasting from all eight stations occurred in RADIO BROADCAST'S test of last November.



MR. H. P. DAVIS

Vice-President of the Westinghouse Company, before the microphone at KDKA where he sent New Year greetings to England at 7 P.M. on December 31, 1923. It was just midnight in England

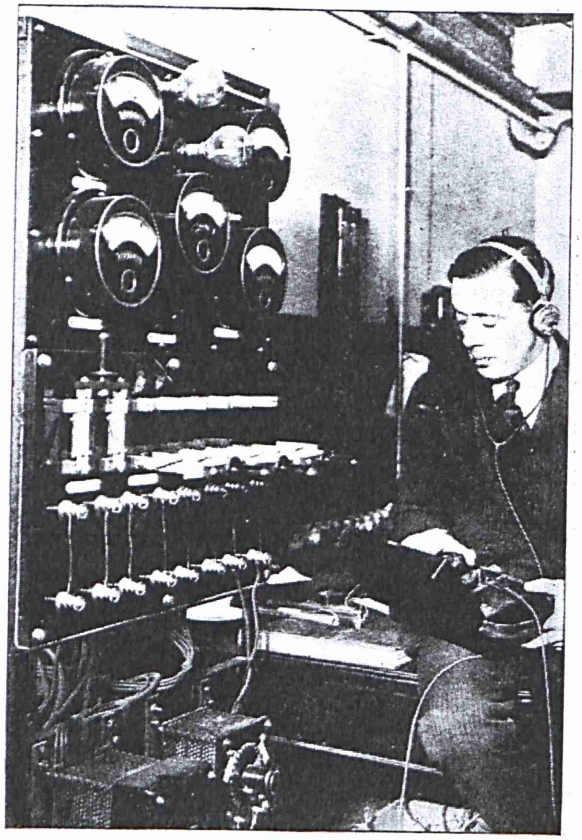


MR. FRANK CONRAD

Assistant chief engineer of the Westinghouse Company, who was largely responsible for the success of the short wave broadcasting

This was the situation when the "Metro-Vick" Company began testing with East Pittsburgh on short wavelengths. After leaving America, Mr. Fleming had not been forgotten by the Pittsburgh broadcast officials and they were constantly in correspondence with him regarding the progress of developments with the high frequencies. After the success of the short wave tests in the United States, the English Company installed a private high frequency receiver in its plant at Manchester, England to test with the broadcasts of KDKA and particularly with the broadcasts sent to KFKX.

After many weeks' testing and frequent changes in the design of various units in the high frequency receiver, the results showed a stable reception and one that could easily be



"THIS IS 2LO, LONDON"

And Captain E. P. Eckersley, chief engineer of the British Broadcasting Company with a wavemeter and long wavelength pipe testing their radiated wave. 2 LO was one of the stations to rebroadcast KDKA's short wave program

placed on the air in England whenever desirable. So the Metropolitan-Vickers Company sent the program out through "Merrie" England and the European continent for the first time, December 29, 1923. The other seven British broadcasting stations were linked in by land phone with the result that all of them were broadcasting KDKA's concerts, a feat never before accomplished.

Of course, this wasn't the first time KDKA had been heard in England. As a matter of fact, KDKA has been receiving hundreds of letters from all parts of the world, telling of the reception of its concerts on its regular wavelength, but the receivers of these broadcast signals did it with multi-tube sets and then the reception at most was greatly dependent upon weather conditions and was quite haphazard. However, here was an actuality that gave every one in the ordinary broadcast range of the English stations, (which, by the way, are limited by law to an output of three kilowatts and which usually operate much below that figure), an opportunity to listen-in.

Knowing from the cables that passed back and forth between England and the American company that the proper time had come to exchange international greetings, arrangements were made to repeat KDKA's concerts throughout England through the Metropolitan-Vickers pick-up with Mr. H. P. Davis of the Westinghouse Company sending the greetings. Mr. Davis gave his New Year's greeting from the East Pittsburgh Studio of KDKA at seven o'clock, Eastern Standard Time Monday evening, December 31, 1923. Because of the difference in time—five hours—this was exactly midnight in Great Britain and Mr. Davis's speech was the first greeting received in the Old World from the New, for the coming year. Mr. Davis said:

"To the people of Great Britain in this New Year's Eve, I send greetings from America and express to you the wish of every American—that Great Britain and her European neighbors may enjoy a prosperous, peaceful, and progressive New Year.

"That the means of communication have been greatly advanced during the past year is fitly shown by the fact that I am able to speak directly to you, across an intervening ocean. This achievement will ultimately result in making known to you America's daily events and your every day happenings known to us.

"A year ago such an achievement seemed beyond belief. With such advancement in the radio art an established fact, no man dares predict what developments will take place before another New Year.

"It is a wonderful thing for the world—this achievement which enables the peoples of one continent to "listen in" on the activities of the peoples of another continent—for the friendship of nations is founded on closer understanding among the various peoples and in no way can different nations better understand each other and become more closely in touch with each other than by improved means of rapid and accurate communication.

"It is also fitting that Westinghouse Station KDKA, the pioneer broadcasting station of the world, should be the first station to develop a means for the repeating of its programs to you, the peoples of other continents, for it was here, and by this station, from which I am now

sending this message, that radio broadcasting was first undertaken. This feat is only another progressive step in the development of this great utility.

"On behalf of the people of America, it is my great privilege, therefore, for the first time in history, by means of the spoken word, to speak directly to you the wish for a happy and prosperous New Year."

The announcer at the time Mr. Davis spoke was an Englishman, chosen because of the fact that his decided English accent would be an added touch to the broadcasting. This announcer was Mr. Sidney Nightingale, who prefaced the speaker's remarks.

An aftermath of Mr. Nightingale's announcing came the next day in a message from his mother, Mrs. J. R. Nightingale of Manchester, England. This lady listened to her son's announcing 3,900 miles away. It is safe to say that a mother, any mother for that matter, after hearing her son's voice coming so far would feel quite proud, but she was particularly proud that her son's voice should be the first that came over from America to be repeated by these British stations.

So, just a year after a speculative talk in the offices of Mr. Davis at East Pittsburgh, the theory of the future had become the established fact and international broadcasting had become a scientific accomplishment.

For this rebroadcasting, KDKA transmits to England on 94 meters (3,200 kilocycles), the same frequency or wavelength at which it transmits to Hastings, Nebraska. The wavelengths of the English stations have been listed earlier in this article and are not important except as being a definite link between the 94 meters of KDKA and the broadcast listener of the Old World.

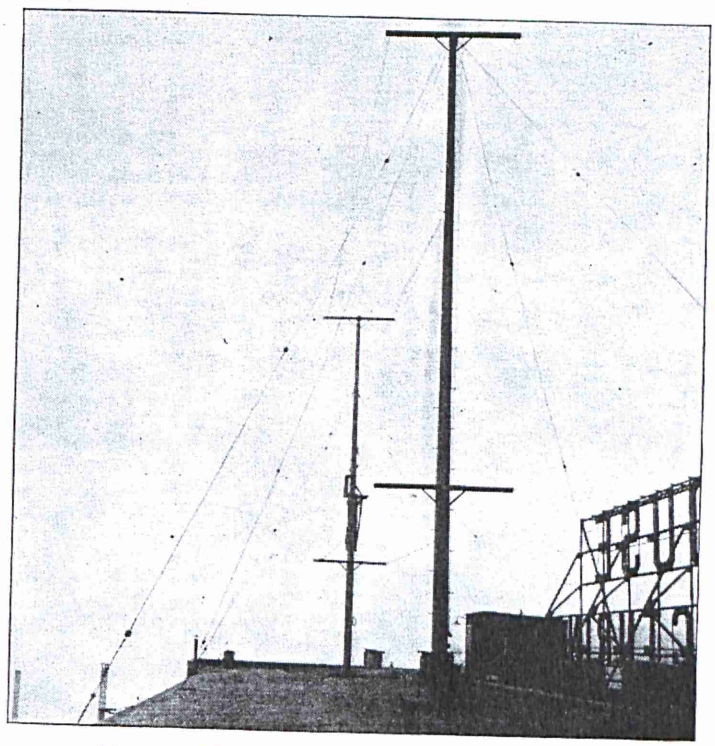
The antenna at East Pittsburgh used for this repeating radio transmission is not more than thirty-five feet long. This is much smaller than the antenna required for ordinary broadcasting. There are only thirty-five feet between flat top and counterpoise. The antenna and counterpoise consist of two small cages.

One of the difficulties of short wave broadcasting is that every precaution must be taken to prevent any outside influences, such as vibration, that would change the frequency. The vibration of the ground or the swinging of the antenna would serve to throw the set off its frequency. To guard against the possibility of swinging, the East Pittsburgh short wave antenna, including the flat top and counterpoise, are stretched between cross arms rigidly attached to the tower instead of the more common swinging spreaders.

The lead-in from the antenna to the counterpoise consists of copper tubing rigidly mounted on long high voltage porcelain insulators on the poles. The various inductances on the set are wound on rigid forms. Copper tubing is used to make all the connections.

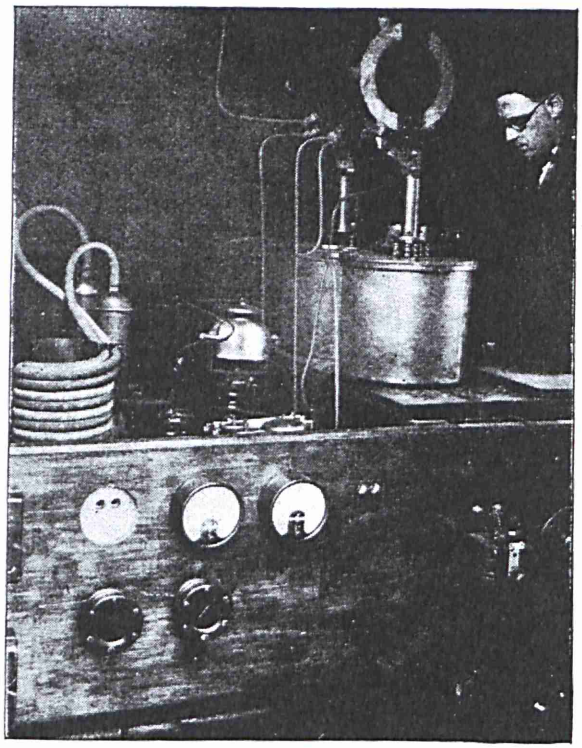
The short wave set at East Pittsburgh is located on the top of a nine-story building and is subjected to the usual jars. But the set is therefore suspended on a system of springs, and vibrations of the building cannot affect the operation of the set.

The transmitting set at East Pittsburgh con-



THIS ANTENNA RADIATES ON 94 METERS

And is only 35 feet long. Note that the spreaders are tightly fixed to the masts, in order to prevent any swinging of the wires and consequent slight variation in the radiated wave. This is the antenna used in sending to England and to KFKX, the "repeater" broadcasting station at Hastings, Nebraska



THE 94 METER TRANSMITTER
In use at KDKA to send programs to Hastings, Nebraska. The transmitter is supported on heavy springs so local jars will not change the wavelength adjustment

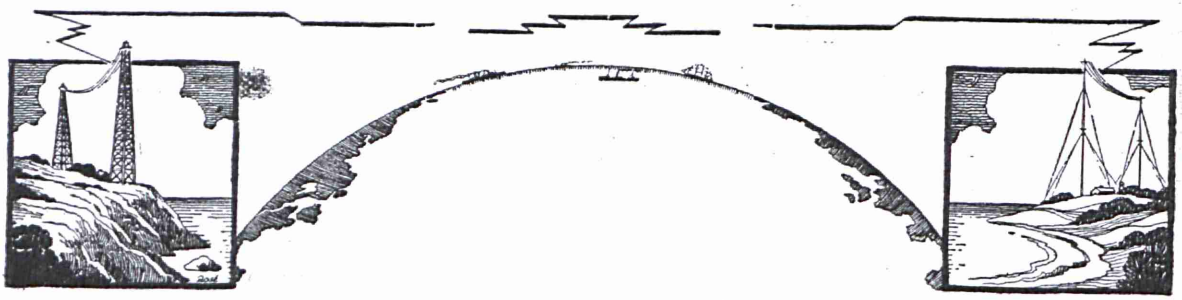
sists of three panels: the rectifier panel, the modulator panel, and the oscillator panel. The rectifier converts the high voltage A. C. current, obtained by stepping up the ordinary plant current supply to high voltage D. C. for the plate circuit. The modulator with its accessories impresses the voice frequency on his high voltage D.C. current before it goes to the oscillator. Finally the oscillator converts the high voltage D.C. currents into radio frequency, in which form it is delivered to the antenna.

Although this article tells primarily of repeating of concerts in England, that all the while that the very short waves of 3,200 kc. are going across the ocean to be received in Great Britain, similar waves are going out to Hastings, Nebraska, where they are being repeated through Station KFKX. Therefore, when KDKA goes into operation, with the repeating equipment in England and at Hastings, Nebraska, the station is covering nearly half of the world.

Not only is this an enormous scientific and engineering achievement but it is also a great step forward toward better international relations. By means of this amazing means of communication, the human touch is possible over thousands of leagues of ocean and it must prove a thing of inestimable good, bringing as it does whole continents into personal communication, which is bound to result in that better understanding so vitally necessary for any lasting peace.

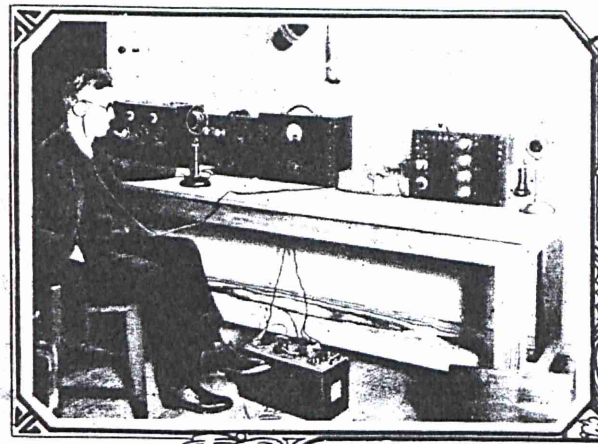
C. W. Horn, superintendent of radio operations of the Westinghouse Company, a man who is very close to the broadcast situation, sees something significant in the English repeating. According to Mr. Horn it sounds the death knell of those stations who either can't or won't put on the air the best of programs. The pace that is being set is very swift and, Mr. Horn thinks, those who can't maintain it will fall by the wayside.

Significantly, the repeating of these English concerts brings to mind the remarks of Mr. Davis, one year and a half ago, relative to the broadcast situation. At that time he said that the only way to obtain the greatest possible good out of radio was to have a few modern powerful and efficient transmitting sets located in such manner as to serve various districts. Within these districts there would be located repeating stations which would repeat efficiently the concerts broadcasted by the central station. Developments of the last few months seem to indicate that this may be the ultimate in broadcasting and with events moving so swiftly, the new year may give the answer.

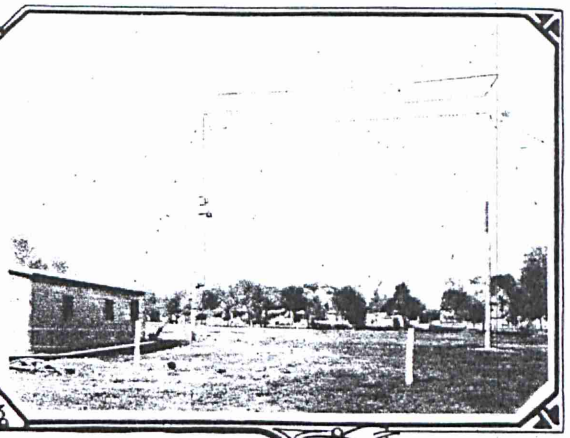


Re-broadcasting, a New Era in Radio

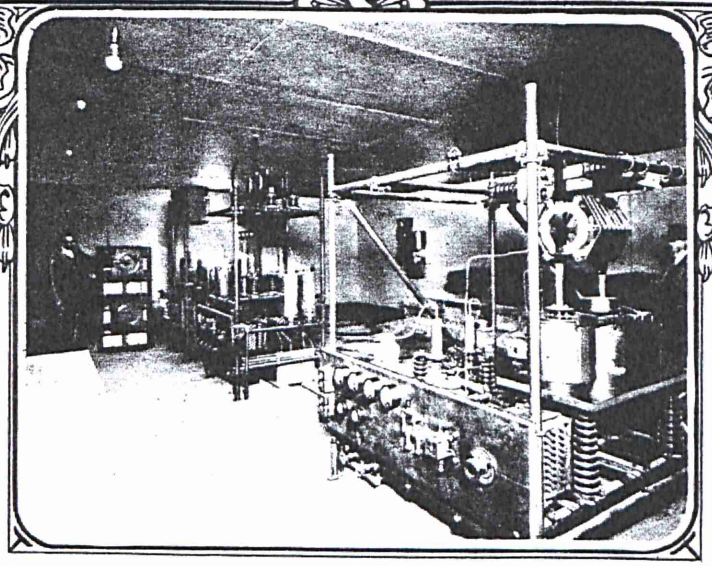
It is gratifying to us to see that re-broadcasting has at last become a reality. This was first indicated in our editorial in the December, 1922, issue. In that issue, as will be remembered, we made mention that amateurs could re-broadcast broadcast concerts by very simple means. It will be seen from this article that the theory has now at last been translated into practise along lines as originally proposed in Mr. Gernsback's editorial. There is a strong probability that in the not too distant future there will be only one or two central broadcast stations which will furnish the whole country with entertainment. This entertainment will then be picked up by other stations which will re-broadcast it. The technical difficulties are, of course, as yet great, but they are surely and gradually being overcome.



Above: Short wave or high frequency receiver at Hastings, Nebraska, used to receive the high frequency broadcasts from Westinghouse Station, KDKA, at East Pittsburgh, Pa. From there it is passed through a power amplifier, then into the transmitter and re-broadcast.



Above: View of the extremely short antenna used to receive the high frequency broadcasts at Westinghouse Station, KFKX, at Hastings, Nebraska.



Left: View of transmitting apparatus at Westinghouse Station, KFKX, at Hastings, Nebraska, the first radio repeating station in the world.

"RADIO broadcast repeating" is the newest phrase in the English language. It came into general use with the announced opening of Station KFKX at Hastings, Nebraska, November 21, 1923, which will be operated as a repeating station, giving no programs of its own.

Radio broadcast repeating is, however, more than a phrase, because it opens a new era in broadcasting.

Radio programs originating in important centers may now be received in isolated and far distant points with the same ease that they are received in the immediate vicinity of the station originating the program.

This is possible in the present instance in the case of KDKA of Pittsburgh, Pa., and KFKX at Hastings, Nebraska. KDKA broadcasts the original program, which is repeated with equal strength at KFKX, thus doubling the range in which the reception of the original program was possible.

The methods used by a radio repeating station in broadcasting are much the same as those employed in the distribution of electric current from a central station. It is a well known fact that the central station, where the power originates, can transmit this power over long distances, and that at the receiving end it can be transformed in a way that makes it suitable for use at the receiving end.

It is practically the same thing with radio repeating. A central station broadcasts the original program. This is sent out on two frequencies—one frequency is such that radio receivers in general use may receive the broadcast; the other frequency is very much higher—so that radio receivers of the type now in use cannot receive it. This is a necessary and desirable feature, as the high frequency transmitting wave must be kept clear of extraneous noises such as are caused by the attempt to tune in with regenerative receiving sets.

This high frequency carries the program to the distant repeating station where it is received with special apparatus and repeated, either at the same high frequency for transmission to another repeating station, or it is re-broadcast at a lower frequency which will permit its reception on existing receiving sets. The repeated program serves an entirely new area, greatly increasing the number of listeners reached.

SPEED OF LIGHT

Owing to the speed at which radio waves travel, which is the speed of light, the repeated broadcast is simultaneous with the original broadcast and the listener is wholly unaware that he is hearing a repeated program.

Radio repeating was suggested and recommended by H. P. Davis, Vice-President of the Westinghouse Electric & Manufacturing Co., nearly a year and a half ago. He stated that the solution of the radio broadcasting problem lay in the introduction of a few centrally located broadcast stations which would serve many low-powered and non-interfering repeating stations, and so bring the best to the greatest number of listeners.

(*Continued on page* 1322)

Re-broadcasting, a New Era in Radio

(Continued from page 1242)

The Westinghouse Company has followed this suggestion and the scheme seems to be the practical solution to the broadcasting problem, as evidenced by the reception given by the public to the new Hastings station.

This station repeats the broadcasts sent from the Westinghouse Station KDKA. After the first program which KFKX repeated from KDKA, letters were received from every part of the continent, telling of the wonderful results.

As Mr. Davis predicted, radio repeating may be the solution of the broadcasting problem. A few broadcast stations so located as to obtain the best program material would be able to supply the entire continent. These stations should have great power and be non-interfering. At distant points there should be repeating stations of great power available simply to repeat the original broadcast at the same high frequency.

COVER NATION

By this means a blanket of high frequency radiations will be made to cover the whole country. Then in each community it would be possible to locate a low powered and repeating station which could be used to repeat the selected program for those living within its range.

The Hastings station is not a low powered repeater. On the contrary, it has the same power, or about the same power, as KDKA, but it was installed to demonstrate the principle of repeating, and can be used to repeat at a high frequency which is inaudible to the ordinary receiving set. Or it can re-transmit at a lower frequency, namely 1,050 kilocycles, or 286 meters, permitting it to be heard by the public.

In actual operation KDKA and KFKX operate in the following manner: KDKA has two transmitters, one of which broadcasts on a frequency of 960 kilocycles. These are the broadcasts which KDKA's audience has been hearing for the past three years. The other transmitter broadcasts the same concert simultaneously on a frequency of 3,200 kilocycles. This broadcast is the one received at KFKX. A special receiver is used which is connected by a telephone line to a transmitter which re-broadcasts the program on a 1,050-kilocycle frequency. There are three transmitters broadcasting simultaneously although the public hears only two of them. Thus is radio repeating actually accomplished.

There is no limit to the range of repeated concerts. KFKX could, just as easily as KDKA, repeat the concert to another repeater located in another section of the country. In fact, with enough repeating stations, one central broadcaster could give service to the entire world.

Scientific American
May 1924

Radio repeating, on the other hand, has no such limitations and possesses flexibility to the utmost degree. While only one such station—the Westinghouse station at Hastings, Nebr., KFKX—is at present in commercial operation, the success already attained with this station is sufficient to demonstrate the possibilities of this method of repeating, and to indicate that it marks the first step toward a comprehensive system of radio repeating which will, in time, cover not only the United States, but the entire world, according to H. P. Davis, Vice President of the Westinghouse company. Under this system, we are assured, it will be possible to listen in on the interesting events of the old and the new worlds.

The system is so flexible that it is susceptible of indefinite expansion without excessive cost. When completely worked out, the owner of every crystal or low-power set, no matter where located, can listen to selected programs in which the best from every quarter of the globe can be included. The primary broadcasting stations need be but few in number, but will be located where the best of program material is available.

How does this radio repeating work? Simple enough—at least now that it has been worked out by radio engineers after several years of painstaking efforts. The KDKA station of the Westinghouse organization, the pioneer broadcaster, please remember, broadcasts two waves at one time. The regular broadcast audiences are being entertained by means of the 326-meter broadcast, while a 94-meter short-wave broadcast is going out to the repeating stations. Tests have proved that the short-wave or high-frequency broadcasts go farther with the same power input than the ordinary broadcast waves. It has also been proved that daylight, which has a marked effect on the usual wave lengths, has little effect, if any, on this carrying power.

Great things are bound to come out of this short-wave transmission and re-broadcasting. Only the other day a concert broadcast by KDKA was picked up in London on a short-wave receiver, properly amplified, and re-broadcasted on the higher wave lengths used by the British broadcasters. The Pittsburg concert, via London, was picked up in Calcutta, India, and held for thirty-two minutes. This system of short-wave transmission and repeating is enabling the British audiences to listen to American radio programs, and even the French, Belgian, Dutch and German listeners-in may have an opportunity of listening to the fascinating strains of American jazz via the British repeating stations.

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Box 3
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Scrapbook 1923-1924.

Davis, H.P. 1868-1931. Papers, 1915-1944.

Westinghouse International

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A Magazine Devoted to the Electrical Industry Throughout the World

VOL. 4 MARCH, 1924 NO. 12

Marvelous Achievement in Radio Engineering is Accomplished

Vice President of Westinghouse Electric Company Sends New Year's Greetings to Peoples of Great Britain by Radio

NEW YEAR'S greetings from America to the peoples of Great Britain and other nations of the world were transmitted at seven o'clock (midnight, London time), December 31, from KDKA, the world's pioneer broadcasting station of the Westinghouse Electric Company, East Pittsburgh, Pa., U. S. A.

The occasion was the first time that such greetings were extended to the peoples of all the world and to H. P. Davis, vice president of the Westinghouse Company, and recognized as "the father of radio broadcasting," was assigned the honor of uttering the first New Year's message heard simultaneously around the world.

Mr. Davis' message follows:

"To the people of Great Britain on this New Year's Eve, I send greetings from America and express to you the wish of every American — that Great Britain and her European neighbors may enjoy a prosperous, peaceful and progressive New Year.

"That the means of communication have been greatly advanced during the past year is fitly shown by the fact that I am able to speak directly to you, the great masses of population of other nations, across an intervening ocean. This achievement will ultimately result in making America's daily events known to you and your every day happenings known to us.

"A year ago such an achievement seemed beyond belief. With such advancement in the radio art an established fact, no man dare predict what developments will take place before another New Year.

H. P. DAVIS

Vice President of the Westinghouse Electric Company, and recognized as "the father of broadcasting"

"It is a wonderful thing for the world — this achievement which enables the peoples of one continent to "listen in on" the activities of the peoples of another continent—for the friendship of nations is founded on closer understanding among the various peoples and in no way can different nations better understand each other and become more closely in touch with each other than by improved means of rapid and accurate communication.

"It is also fitting that Westinghouse station KDKA, the pioneer broadcasting station of the world, should be the first station to develop a means for the repeating of its programs to you, the peoples of other continents, for it was here, and by this station, from which I am now sending this message, that radio broadcasting was first undertaken. This feat is only another progressive step in the development of this great utility.

"On behalf of the people of America, it is my great privilege, therefore, for the first time in history, by means of the spoken word, to speak directly to you the wish for a happy and prosperous New Year."

World broadcasting by radio, which is undoubtedly the most marvelous achievement in the history of radio engineering, was accomplished several days ago by the Westinghouse Company, co-operating with the Metropolitan-Vickers Electrical Company in England.

The program of the Westinghouse Company was broadcast from Station KDKA on 100 meters and picked up by the Metropolitan-Vickers Electrical Company's station at Manchester, England, and repeated by the latter station on 385 meters. It has been learned authoritatively that the latter station has received messages from many parts of the European continent, stating that the Westinghouse

RADIO BROADCASTS TALKS 7,000 MILES WITHOUT WIRE'S AID

Technology Dinner Program Made Available to 50.000,-000 Listeners.

HAILED AS GREATEST FEAT

Speeches and Music Heard From the Pacific Coast to British Isles.

SENT DIRECT INTO THE AIR

American and British Companies Cooperate in Use of Recently Perfected Invention.

What was hailed as the greatest achievment in relaying radio broadcasting was staged last night at the dinner of the Massachusetts Institute of Technology, held in the Waldorf-Astoria, when six stations, spanning 7,000 miles, broadcast simultaneously speeches and a musical program.

The test brought into use an invention perfected by Frank Conrad, Assistant Chief Engineer of the Westinghouse Company at Pittsburgh, which eliminated the use of telephone wires for the transmission of the music and words and put the entire program entirely into the air. According to the radio officials in charge of the experiment, the broadcasting reached a radio population of 50,000,000 persons.

Working in on the task of distributing the program were stations located in San Francisco, Hastings, Neb., East Pittsburgh, Schenectady, New York and London, England. It was estimated that the radio waves shot out from these stations covered 1,500,000 square miles.

Participating in the demonstsation were three American and one British campany. The American companies were the Westinghouse Electric & Manufacturing Co., the General Electric Company and the Radio Corporation of America. The British company was the British Broadcasting Company. The stations operating were WJZ in New York; WGY in Schenectady; KDKA at East Pittsburgh; KFKX at Hastings, Neb.; KGO at San Francisco. The stations under the direction of the British Broadcasting Company in Great Britain used Station 2AC in Manchester as the pick-up unit.

nett's testimony that he had a conference with Attorney General Daugherty. Mr. Bennett said he thought the conference was held at Mr. McLean's request. The witness said he had verbally told John F. Major, secretary to Mr. McLean, about the result of the conference, with instructions to send it to Mr. McLean.

"Will you repeat the substance of what was given to you by Daugherty to send to McLean?" Mr. Bursum asked.

"To the best of my ability," Mr. Bennett replied, "he said, 'Tell Ned not to worry; he is a side issue in this thing. In two or three weeks I will be the middle of the whole thing. I am attending to things. I am getting posted, and I will do what I can to help'—something like that."

"To do what to whom?" the Senator asked.

"To avoid McLean being called up here to testify—that is all," Mr. Bennett answered.

Q.—Did your impressions from the White House have any relation to the President's interest or connection with the present oil investigation, so far as it affects or concerns Mr. McLean? A.—No, no sir.

"Then your impressions with reference to what you have here stated concerned purely a matter of public interest, or public policy?"

"The President took questions, I believe the system was put in some one of the few I have attended. But I believe the syste mwas put in some years ago that the President would not answer verbal questions right off the bat, but he preferred that the question be submitted in writing. And we went in there, and the room was almost full, and he stood up and greeted the correspondents who came very close around him, and he began to go over papers—slips of papers.

"He would hold one under, and then he would stop at one and say, 'I have here a question, so and so.' And he would answer that question. Then he would go through and he would say, 'Here is a question I don't care to consider.' He may have referred to what the question was. He turned that under, and looked at another, 'Here is a question on so and so.'

"And I remember he spoke quite in detail about the legal aspect of this case as distinguished—that is, the legal, I think he used the word legal—aspects of this case as distinguished from the question of authority of the President

Metropolitan-Vickers Company at Manchester, England.

"In England, the Metropolitan-Vickers Station was linked with its seven sister stations, and immediately the KDKA was picked up repeated the program simultaneously all over Great Britain. Hastings, too, was scheduled to broadcast the same signal, but also relayed it to Station KGO in San Francisco, which station also picked up the broadcast waves and repeated them on a different wave length than the one on which they were picked up."

In speaking of the test, Mr. Davis, who spoke before the reports on the test had begun to filter in, said that in the repeating feature alone—the relaying by air from station to station—he saw a realization of his prophecy made two years ago regarding the ultimate in radio broadcasting. Mr. Davis then predicted that the time would come

and soon when a few powerful stations would serve numerous small repeating stations throughout the country.

See Powerful Aid to Peace.

In developing the uses to which the radio "blanketing" of the world might be devoted, officials said it was a powerful aid to peace. They pointed out that a closer and more harmonious relationship between the peoples of America and those of Europe would be likely to result.

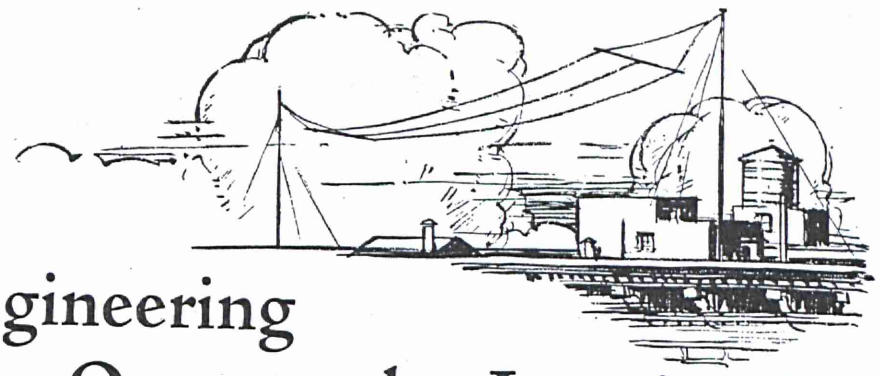
The listeners-in, assigned to flash word to the dinner in the Waldorf-Astoria on the success or failure of the test, were stationed at fifteen points

office where she is employed as a designer at 18 West Thirty-second Street.

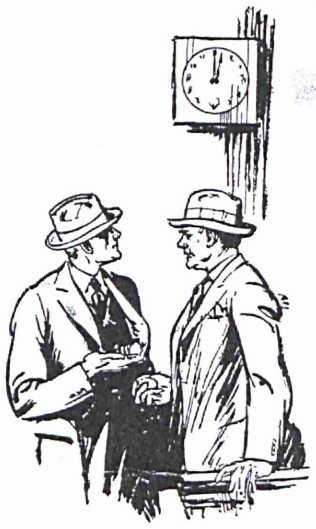
He became so scared he said that he threw $240 out of a window at 159 Madison Avenue, $105 in the street on his way to Central Park and hid the remainder and the bag beneath a rock in Central Park. His statements were checked on by Detective Archibald Wood of the West Thirteleth Street station and found to be correct.

Salvador Accepts Peace Treaty.

SAN SALVADOR, March 7.—The National Assembly has approved the treaty of peace and amity which was signed by the Central American Republics in Washington in February, 1923. Exception was taken, however to that part of the convention providing for the establishment of a commission of inquiry.



What Engineering Owes to the Imagination



From An Argument Over Watches Came KDKA

BACK in the days when wireless was just beginning to spread, Frank Conrad (now Assistant Chief Engineer of the Westinghouse Electric & Manufacturing Company) and another official, happened to compare watches, to see if it was time to go back to work. Their watches differed.

Unable to convince his friend that his watch was right, Mr. Conrad suddenly remembered that the naval station at Arlington, Va., had just inaugurated a system for sending out daily time signals by radio. Just the thing to prove his point!

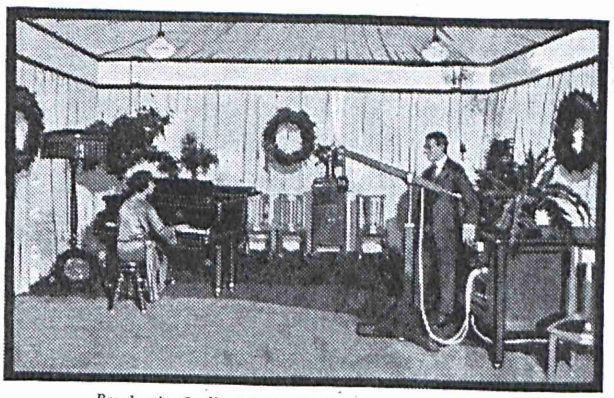
So he built a simple set of receiving apparatus, erected an aerial, and—you can imagine what happened! He was badly bitten by the radio bug. After proving to his satisfaction the accuracy of his watch, he started experimenting with the transmission of music by radio, with good success.

He began sending out phonograph music from his home, and attracted the attention of some of the big department stores, that had installed radio departments. They in turn, started advertising Mr. Conrad's "musical evenings."

Then, one day, upon arriving at his desk, he was summoned to the office of Harry Phillips Davis, Vice President of the company.

"Frank," said Mr. Davis, "I'm going to close your radio station." His attention had been attracted the night before to a simple note in a full-page advertisement, which read, "Mr. Conrad will send out phonograph music this evening."

You know the rest. In November, 1920, "KDKA" was formally opened to send out election returns. It had received the first license issued by Uncle Sam. Today over 500 broadcasting stations entertain and educate millions of people each night, a wonderful result from so insignificant an argument as one over watches.



Broadcasting Studio at Station KDKA, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

Westinghouse

ACHIEVEMENT & OPPORTUNITY

WESTINGHOUSE ELECTRIC

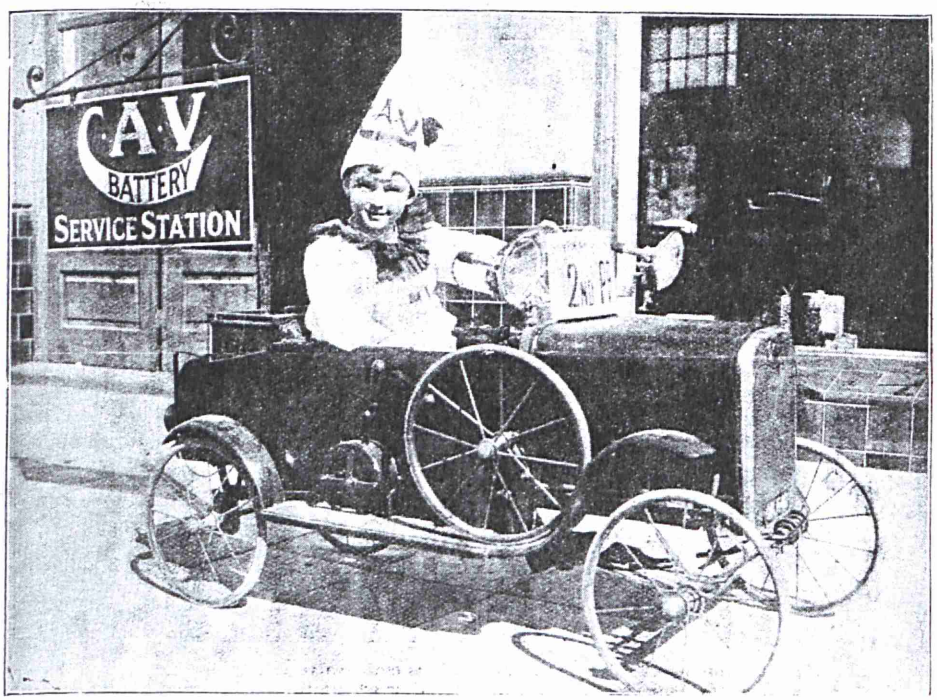
Motor Weekly 4/26/24
Bloemfontein, S.A.

The Voice of the World

International Broadcasting Achieved by Radio Engineers

MARKING an epoch in the history of radio engineering, world-wide radio broadcasting was achieved on the night of December 31, 1923, when H. P. Davis, Vice-President of the Westinghouse Electric and Manufacturing Company, transmitted New Year's greetings that were heard in many lands from KDKA, the pioneer broadcasting station of the Westinghouse Company at East Pittsburgh, Pa., U.S.A.

For the first time in history it was possible by means of the spoken word that such a message be



A Model Prize-Winner.—A miniature model car loaned by Mr. Crawford and fully equipped with electric headlights and tail lights by the Auto General Electric Co. It took second prize at the Ramblers carnival during the Central Show at Bloemfontein.

nt to the peoples of so many nations. This marllous achievement was made possible through dio broadcasting repeating. The message from DKA, besides being transmitted on a wave length 326 meters for local reception, was sent out on wave length of 100 meters and was picked up, mplified, and repeated by the Metropolitan-Vickers Electrical Company's radio station at Manchester, England, and by the Westinghouse repeating station at Hastings, Nebraska, U.S.A.

Mr. Davis in his message said: That the means of communication have been greatly advanced during the past year is fitly shown by the fact that I am able to speak directly to you, the great masses of population of other nations across an intervening ocean. This achievement will ultimately result in making America's daily events known to you and your everyday happenings to us. A year ago such an achievement seemed beyond belief. With such advancement in the radio art an established fact, no man dare predict what developments will take place before another New Year.

"It is a wonderful thing for the world—this achievement which enables the peoples of one continent to 'listen-in' on the activities of the peoples of another continent—for the friendship of nations is founded on closer understanding among the various peoples and in no way can different nations understand each other and become more closely in touch with each other than by improved means of rapid and accurate communication.

It is also fitting that Westinghouse station KDKA, the pioneer broadcasting station of the world, should be the first station to develop a means for the repeating of its programmes to you, the peoples of other continents, for it was here, and by this station, from which I am now sending this message, that radio broadcasting was first undertaken. This feat is only another progressive step in the development of this great utility."

Gazette Times
Pittsburgh, Pa
April 14, 1924

ROUND-WORLD RADIO BROADCASTING PLAN EXPLAINED BY DAVIS

Says Programs From Any Part Of Globe Will Be Heard Soon.

H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, known as the "father of broadcasting," has made public a plan for world-wide wireless progrems combining all the modern engineering achievements of radio transmitting.

The plan proposed makes use of radio repeating, eliminates interference possibilities and shows how in the near future the radio listener will be enabled to hear programs from London, Paris or any part of the globe with the same ease as programs from local stations are now heard.

In the last few months the public has heard much regarding radio repeating without realizing, perhaps, just what this extraordinary achievement of radio engineering means to the future of radio, Mr. Davis said. Before world-wide wireless is a reality there will have to be installed special stations in various parts of the globe and these stations must be located advantageously.

Radio repeating was the outcome of the development of short-wave transmitting. This means the sending of radio signals on a wave length of 100 meters or lower. Because the wave length is so low it is not heard on the ordinary receivers and therefore is called the inaudible wave.

Certain central stations will be located at world centers. These stations will be equipped to transmit on the inaudible wave length or the audible wave length. The audible wave transmitter need not have excessive power, so that its operation will not interfere with distant tuning by adjacent radio receivers. These transmitters will not need more power than have the leading stations of the United States today. The inaudible transmitters, however, may be highly powered to give them the ability when necessary to maintain a constant range. As the signals will be transmitted on the audible wave length the power used will not cause interference with receivers.

Such a system also will need a world-wide and very efficient program collecting organization. This program organization will be operated somewhat in the manner of the great news agencies of today and will continually be on the search for interestinig programs from /every point in the world.

New York Tribune
April 1924

New Process Brings World To Any Radio

Expert Tells of Method of Sending Through Repeating Stations Without Interfering

Short Silent Wave Solves Problems

Development Will Make London as Easy to Get as Local Programs

A new process which will enable New Yorkers to get London stations on their radios as easily as they get local stations was explained yesterday by H. P. Davis, vice-president of the Westinghouse Electric and Manufacturing Company. The "Father of Broadcasting" described the method used in recent successful experiments to transmit on inaudible, or low-frequency, waves and through repeating stations without causing interference.

"Radio repeating, when it was first successfully accomplished," said Mr. Davis, "was the outcome of short-wave transmitting. This includes wave bands of 100 meters or less. These waves are inaudible, as the audible waves lie between 250 and 600 meters. Transmitting on inaudible waves opens a new field of possibility in radio.

Central Station Planned

"Certain well designed central stations will be located at the world centers. These stations will be equipped to transmit on the audible or the inaudible wave lengths as desired. The audible wave transmitter need not have excessive power, so that its operation will not interfere with distant tuning by adjacent receivers, if desired. These transmitters will not need any more power than have the leading stations of the United States to-day. The inaudible transmitters, however, may be highly powered to give them the ability when necessary to maintain a constant range. As their signals will be transmitted on the inaudible wave lengths the power will not cause interference with receivers.

World-Wide Radio Near

"Booster stations, located at advantageous points will receive these inaudible waves and pass them along amplified. Certain other stations will be equipped with short wave receivers in order to pick up these inaudible waves and rebroadcast the signals locally on audible waves."

Mr. Davis pointed out that the prospect of actual world-wide radio without interference to the listener is opened up by this development. The radio fan will soon be able to hear speeches or musical programs from any part of the world. Only the details of organization remain to be perfected.

New York Times
April 16, 1924

Yesterday's Invention Revolutionized.

It is not for the uninitiate in electrical mysteries to understand what Vice President H. P. Davis of the Westinghouse Company had to say, the other day, about "radio repeating" and the short wave length, which he called "inaudible" in contrast with those that can be heard by means of the receiving sets now in common use. His authority is sufficient, however, to make it quite safe to accept his assurance that before long, by means of specially constructed broadcasting stations, judiciously distributed among the world's cities, any one of their inhabitants can be put in direct communication with any other.

That is not so far from being the situation, even now, but, according to Mr. Davis, "radio repeating" has begun a real revolution in the utilization of a facility which still is so new that it might have been expected to remain as it is for a while at least. This revolution, he declares, unlike some others, is to result in changes for the better, including the abolition, to a considerable extent, of both the fact and the possibility of the interference of broadcasters with each other, which at present is often so annoying and not infrequently prevents all intelligible communication.

Whatever the improvement, however, the public will refuse to be astonished or even surprised. It has been so familiarized with miracles in these latter days that it takes them all, as they follow in quick succession, as matters of course, and has become so nearly certain that the supply will be kept up that it awaits the new ones with entire calmness.

Radio and the Election.

It is to be hoped that the vice president of the Westinghouse company is right when he predicts great increase in voting next November as a result of the broadcasting of the conventions of the two major parties. It is a word of cheer. In New York, goodness knows, the feeling in recent days has been that the country is so thoroughly disgusted that somebody will be elected by default. Mr. Davis seems to believe that although the people back home may be impatient of certain aspects of convention activities, and weary of the seemingly interminable deadlock at Madison Square Garden, they are none the less mightily interested in politics.

The only reasonable way to reconcile these two views is to suppose that although the people may be disgusted, they are determining to set things right. Such a resolution would unquestionably bring forth a tremendous vote in November.

In fairness to the delegates to the conventions of the Republican and Democratic parties, however, a word needs to be said to the head-shakers back home, whether in Kalamazoo or Connoquenessing. For whatever the radio audience has heard that it would rather not have heard it has only itself to blame. The reason that neither the Republicans at Cleveland nor the Democrats at New York have achieved perfection is because the citizenry of the Nation they have represented has not achieved political perfection. Indeed, when it is considered that as citizens the country over we have voted less than 50 per cent, it becomes debatable whether the conventions have not done their work better than the rank and file of the citizens have done theirs. This convention at New York votes, at least.

The Outlook for April 30, 1924

World Radio for Everybody

LINKING up the large centers of the world by a network of combined broadcasting and relaying stations so that the finest programmes available anywhere may be heard by the owners of even the small radio sets is the new plan explained by H. P. Davis, Vice-President of the Westinghouse Company, who developed the pioneer broadcasting station —Station KDKA of Pittsburgh.

Instead of broadcasting over five hundred separate programmes from as many American stations, as is being done at present, most of which cannot be "picked up" by the average listener situated more than a few hundred miles distant and many of which are too inferior to warrant listening to, the plan is gradually to reduce the number of programmes broadcast and concentrate on the best, and at the same time to make these premier programmes available to the owners of the simplest receiving sets. The practical advantages of this method of spreading the broadcasting out evenly are obvious.

In addition, and fully as important, are the technical advantages incidentally to be gained.

Chicago Tribune
Feb. 12, 1924

When it gets into its full stride, KDKX, the Westinghouse relay station at Hastings, Neb., probaly will be one of the most popular in the middle west.

HARRY P. DAVIS.

"I had KDKX clear as a bell last night," is the comment that comes in generally with letters to THE TRIBUNE, asking "why the full programs of KDKK aren't printed?"

So once more the attention of radioans is called to the fact that this new station is a relay for KDKA, East Pittsburgh, although it is broadcasting two programs of its own each week—on Monday and Thursday evenings, from 9:30 to 11 p. m., the programs being mostly contributed by local artists. Practically daily, or as often as conditions premit, the broadcasts from KDKA are relayed. No definite schedules for these broadcasts has been arranged, but the KDKA dinner concert at 5:15 (central time) can often be heard. KDKX does all broadcasting on 286 meters.

Harry P. Davis, vice president of the Westinghouse Electric and Manufacturing company, is the man responsible for the idea of rebroadcasting as well as being the father of radio broadcasting, he having directed erection of KDKA at East Pittsburgh and also of KDKX.

Improved Radio Broadcasting Service

There are now in the United States and Canada more than 600 radio broadcasting stations. Of this number approximately 130 are using 500 watts, or more. In general, these stations are sufficiently scattered so that the broadcasting from them covers the entire country.

With so many high-power stations there is, however, if receiving conditions are good, a considerable overlapping and as a result more or less interference, so that the listener needs fairly good receiving equipment to pick out any particular station and bring it in so that the quality is good. This is especially true if he is located in the vicinity of one of these stations.

Aggravating this situation is the public's desire for distant reception. In an effort to obtain distance in too many cases the listener tries to "get" stations which are beyond the proper capacity of his receiving apparatus, which results in forced regeneration, especially with certain types of sets. This results in turn in a bedlam of whistles and shrieks—"birdies"—which, in the case of weak and medium signals from the transmitting station, causes these attempts at reception to seriously interfere with the clear reception of that station by the neighbors.

What is the remedy for this condition? Clearly, nothing but a system of broadcasting which will curb the desire on the part of the listener to receive stations beyond the capacity of his set.

As a matter of fact, it is generally the case that the program from one or more of the stations well within the listener's receiving range is just as good as—probably better than—the great majority of those that are farther away, and can be received without the distortion which is inevitable from the interference between the transmitting stations and the "birdies" from over-regenerated sets.

If it were possible for the nearby station, instead of the listener, to do the "hunting" and to provide the listeners with the best that the broadcasting stations of the country were featuring as programs for the evening, it is believed that this would, to a large extent, satisfy and hold the interest of listeners to their local station. There is hardly a night when there are not events of intense interest being broadcast from some location, or when music of superlative excellence or a speech of national importance is not available to which the majority of listeners would be glad to listen, and would be satisfied to hear the program through. If the station doing this transmitting, however, is at some distance, then crystal and single-tube sets cannot be used satisfactorily. The possessor of the latter type of set, however, in an effort to receive, will cause disturbances that are not fair to his neighbors. In other words, the cheaper and simpler sets which are undoubtedly in the great majority, cannot receive such special features unless they happen to be close to the transmitting station.

It is the correction of this whole situation that must be worked out. It can be improved, of course, but never corrected, by forcing the use of receiving sets in which possibilities of disturbances of this kind are eliminated or greatly reduced.

The crystal set is ideal in some ways as it does not generate any power of its own, and therefore cannot cause disturbances. Tube sets in which the regenerative feature is eliminated are either of short range or of an expensive nature and somewhat complicated in operation.

The quickest approach to a correction of these difficulties would be to have the features referred to above broadcast from every station in the country, or from stations so located and spaced throughout the country as to provide the possibility for all crystal set listeners to listen in.

Two methods are available for performing this service—one by telephone wire transmission at audio frequencies, and the other by wireless transmission at radio frequencies. Both are entirely successful. Simultaneous broadcasting by a number of stations, widely separated, has been carried on at intervals by wire transmission for some time. Unfortunately, however, the limitations of this method are considerable and the difficulties of repeating programs increase with the distance and the number of stations, so that while it is possible to do this, from the cost standpoint it appears entirely impractical to consider the possibility of a comprehensive repeating scheme.

In addition to this, a most serious limitation is the lack of flexibility at the repeating station, to permit it to shift from one program center to another, as it would be impossible to change the telephone wire connections, without prearrangement.

Radio repeating, however, has no such limitations and possesses flexibility to the utmost degree. While only one such station—the Westinghouse Electric & Mfg. Company station at Hastings, Nebraska, KFKX is at present in commercial operation, as described in this issue of the JOURNAL, the success with this station is sufficient to demonstrate the possibilities of this method of repeating, and to indicate that it marks the first step of a comprehensive system of radio repeating which will in time cover not only the United States, but the entire world. Under this system it will be possible to listen in on the interesting events of the old and the new world.

The system is so flexible that it is susceptible of indefinite expansion without excessive cost. When completely worked out, the owner of every crystal or low power set, no matter where located, can listen to selected programs in which the best from every quarter of the globe can be included. The primary broadcasting stations need be but few in number, but will be located where the best of program material is available.

The "pick up" equipment for these primary stations, which is now connected to the broadcasting station by means of telephone wires, will instead use radio frequencies, with short wave transmission. This equipment will be more or less mobile, so that it can be taken at will to the location where the event occurs. Here the feature will be picked up and transmitted at an inaudible frequency, so far as receiving sets are concerned, to the nearest primary broadcasting station. This station will then broadcast at two frequencies—one which the local listener's receiving set can receive,

and the other the inaudible or repeating frequency, which will have high power, to obtain distance transmission. This latter will be picked up by a chain of repeating stations of the same nature as the Nebraska station, also using an inaudible frequency, and can be made to circle the globe.

There are a good many possible paths in the ether for these repeating waves, and with a sufficient number of properly located high power repeating stations an indefinite number of programs will be made available for the secondary broadcasting stations of low power, which will repeat and broadcast at a frequency audible for receiving sets.

While this is a crude and incomplete description, it is, I hope, sufficient to indicate the possibilities. The future of broadcasting will be determined largely through the success by which such a system, or a similar one having equivalent possibilities, can be worked out.

Reference has been made so far only to the repeating possibilities, but necessarily the features of local interest cannot be overlooked. It is obvious, however, that it will be easy for the secondary broadcasting stations to include in their programs items of local interest, and which are of interest only to the immediate vicinity. Thus, the local listeners will be able to receive everything that they have had under the present limited system; and in addition, have available the interesting events of the world, and will be permitted to use, with perfect ease, the cheaper and simpler types of receiving sets.

From the national, or even international standpoint, and from the view of the greatest good to the largest number of people, it would seem that some such system is essential. It would have the immediate effect of materially strengthening the quality of the programs sent out by the majority of the broadcasting stations. It would greatly heighten the interest in radio broadcasting, and increase its value to the public in general by enormously increasing the scope of the programs and the availability of simple receiving sets.

H. P. DAVIS

Philander Johnson

Hope Ended.

"You used to be a great advocate of spelling reform."

"I've given up hope. What chance for it is there when half the country agrees that KDKA spells 'Pittsburgh.'"

Washington Star Nov 24

H. P. Davis Discusses Future of Radio

WHITHER is radio broadcasting bound?

Can radio broadcasting be compared to a ship with full sails, speeding along, ever going faster but with no helmsman and constantly changing its course?

Or is it like a modern ocean greyhound with tremendous speed but with a captain at the helm, every post manned, its destination fixed and the ship held strictly to a pre-arranged course.

These questions were asked H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, a man who has been in direct touch with radio since its start and who, by organizing and by starting KDKA, actually gave present day broadcasting to the world. Mr. Davis has very decided views for the control of radio broadcasting. In reply to the questions Mr. Davis made the following statement:

"Today, radio broadcasting can be compared to neither of these illustrations. Radio broadcasting is neither at the mercy of the winds nor is it fully manned or properly controlled.

"Yet no one doubts that, radio needs the guiding hand. The influence of radio upon the public is tremendous and this influence is growing faster and faster; still radio is not travelling a prearranged or well-ordered course. This, however, is to be expected and it is well that it is so until practical experience points the proper avenues of development and organization, which will lead to a permanent, well-ordered, satisfactory and world-wide public service. This future is still obscure but I feel sure that its solution is near at hand.

"At the present moment I feel that the practical requirements of greatest development must point the way and control the situation and that everything should be subordinated to the obtaining of such an end, even though it may introduce selfish considerations. Such conditions often are usually the greatest spur to final perfection in the shortest time. This should be encouraged by giving organizations possessing the ability and facilities, sufficient protection and promise of future security in the broadcasting field, to make them willing to spend the money and make the efforts necessary to accomplish the most in the shortest time.

"America had led in this development because this principle has been in operation. It would be a pity now to so regulate, hamper and discourage these organizations by annoying restrictions that this incentive be destroyed and thus America loses its pioneer station.

"Of the great organizations of which I speak, the Westinghouse Company is an example. It should be encouraged to develop, expand and operate the stations it will [illegible]. Only such organizations to carry on the radio development and organization to the end where the highest degree of public service may be obtained.

"Radio broadcasting is new and progress ever demands intense research, new development, new inventions, new ideas and new applications. The pace is swift and very expensive.

"Organized broadcasting, with its regular service as it exists today, would not have been possible except for the personnel and facilities of the Westinghouse Electric & Manufacturing Company. Every step in design of studios, stations and technic of broadcasting was first worked out by that company. I do not know of a single program, method of feature that is broadcast, from the several hundreds of stations existing today, that was not pioneered by the Westinghouse Company.

Because of the research and engineering talent and facilities of the Westinghouse Company, the first dry cell tube for use in broadcast receivers was perfected for practical uses; the first ultra-audible microphone for transmitting purposes was developed; the first really simplified radio receiver was given the public; and a system of short wave repeating was developed which makes world-wide broadcasting practical. These are only a few developments of one company in the radio field.

"Could one imagine these developments taking place were radio development restricted as it would be if placed entirely under the control of the government or private individuals or organizations not possessing the facilities so ever present in these great electrical organizations. Many research and radio engineers are continually at work, devising, planning and perfecting for radio progress. These many minds, spurred on by the necessity for development, are responsible for all the progress in radio. Without such conditions radio would have no future but only a past.

"Therefore, for the greatest good of the public, we should keep these electric companies prominently in the field; keep all their research and engineering facilities organized and interested to the highest degree, so that radio may progress continually.

"Then, lest there be some who take advantage of this condition let the government appoint a non-political and unbiased interstate radio commission.

Let this commission take the helm, as it were, and be the guiding hand. Let the radio commission direct the general policy of organization and development so that the public may always have the best. I cannot conceive anything different in the final outcome. An agency so vast in its possibilities for human good is bound to reach the proper

Westinghouse News - June 1924

Vice Presidents Elected Directors

AT THE ANNUAL STOCKholders meeting, June 11, two new members were elected to the board of directors. Vice President H. P. Davis was elected for the term which will expire the second Wednesday in June, 1925; and Vice President L. A. Osborne for the term expiring the second Wednesday in June, 1927.

Mr. Davis is known throughout the industrial field because of his achievements with electrical apparatus for industrial work. Within

H. P. Davis

the past few years, however, his accomplishments have become known to practically every man, woman, and child in the United States and elsewhere who has developed an interest in radio, as "The Father of Radio Broadcasting."

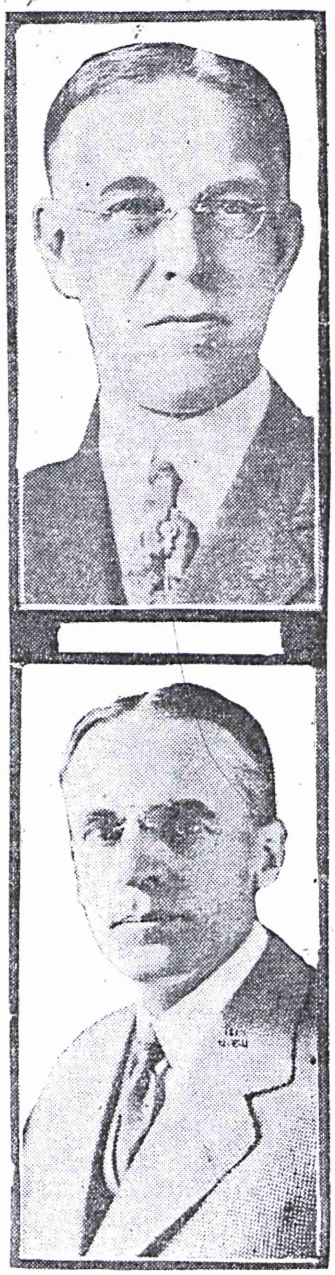
The list of seventy-seven patents issued to Mr. Davis shows the breadth of his interest in the chain of apparatus that constitutes every electrical installation. This list is made up of such items as resistance coils, circuit-breakers, controllers, fuse blocks, solenoid brakes, trolley clamps, and similar devices. A trouble-less transmission line has been his ideal, and he has done much to remedy those defects in details that were so conspicuous in the early days of electrical engineering. In addition, he has also done excellent creative work with arc lamps and meters. His arc lamp set a standard in the days when this form of illumination was dominant, and his alternating-current meter (in which Frank Conrad was co-inventor) superseded the original Shallenberger type. For the past fifteen years he has worked in wider fields, but his devotion on the perfection of every part has always been maintained.

Mr. Davis is known not only as a designing engineer of high rank, but also a man who gets things done. It is a tradition in his organization that whatever work is assigned to him is certain of rapid completion. This ability to accomplish results regardless of overwhelming difficulties was admirably illustrated during the war. He was at that time in charge of production at the East Pittsburgh Works, and the duty of fulfilling the government contracts for munitions fell upon him. The quantities involved were enormous; the time limits short; the specifications were most rigid; new and undreamed of problems arose at every step; the Government's plans changed with bewildering frequency; material, competent help, and transportation facilities became almost unobtainable; and innumerable other obstacles were encountered. Yet in spite of everything, the work was done and it was done properly and on time. Not a single promise made to the Government was broken.

Mr. Davis was born in Somersworth, New Hampshire, in 1869. He graduated from The Worcester Polytechnic Institute, with the degree of B.S. in Electrical Engineering, in 1890, and after a trip to Europe and a few months spent with the Thompson-Houston Company, entered the Detail Engineering Department of our Company in 1891. In 1896, he was placed in charge of this department, and in 1908, he was made Manager of the Engineering Department. This position he held until 1911, when he was elected Vice-President.

Loyall A. Osborne was born in Newark, N. J. in 1870 and was graduated from Cornell University

Elected Directors At Westinghouse Annual Meeting



H. P. Davis.

L. A. Osborne.

H. P. Davis and L. A. Osborne, vice presidents of the Westinghouse Electric and Manufacturing Company, are among the directors elected at yesterday's meeting of the stockholders of the company.

Mr. Davis is known through his work in the interest of the public in radio broadcasting and Mr. Osborne through his work in giving an impetus to American designs of electrical apparatus in the Far East.

1923-24

TUESDAY MORNING,

Oct 7-1924

RADIO MEET

PLAN TO LINK STATIONS URGED BY HOOVER TO DEVELOP FIELD

Co-Operative Program Plan Suggested to Conference.

WESTINGHOUSE FIRM LAUDED

BY THE ASSOCIATED PRESS.

WASHINGTON, Oct. 6.—Organization of a national system of radio programs through a broadcasters' association to give service much as press associations do for newspapers was suggested by Secretary Hoover tonight, in an address opening the third national radio conference.

The conference was attended by representatives of all branches of the industry and was called by Hoover to consider the numerous problems of radio development in the United States. The address tonight was broadcast through a system of 16 radio stations.

INTER CONNECTION IS BASIS.

In presenting his views tonight, Hoover reiterated his opposition to any attempt to monopolize the air, declaring that local broadcasting stations are of first importance, and must not be driven from the field.

The secretary's suggested plan for a national program association would provide for a self-sustaining system of interconnection of radio broadcasting stations, and the offering through those stations of the best the nation has in music and entertainment.

RAPS GOVERNMENT CONTROL.

"My proposition," Hoover said, "is that the local station must be able to bring to its listeners every important national event with regularity. But far beyond this it must be able to deliver important pronouncements of public men, it must bring instantly to our people a hundred and one matters of national interest. This can only be accomplished by regularly organized and directed programs for some part of the day in supplement to more local material.

"It may be stated with assurance that the greatest advance in radio since our last conference is the complete demonstration of the feasibility of inter-connection. We owe a debt of gratitude to those who have blazed the way. The pioneers have been the American Telephone and Telegraph Company in wire interconnection and the Westinghouse Electric and Manufacturing Company in radio inter-connection through the use of short wave lengths.

"It is our duty to consider the possibilities and potentialities of interconnection as a regular daily routine of the Nation. Unless it be systematically organized we cannot expect its continuation. I realize that this matter, except insofar as it may be fostered and encouraged, does not lie in the Government. It would be unfortunate indeed if such an important function as the distribution of information should ever fall into the hands of the Government. It would be still more unfortunate if its control should come under the arbitrary power of any person or group of persons. It is inconceivable that such a situation could be allowed to exist.

"I do not believe there is any practical methods of payment from the receivers. I wish to suggest for consideration the possibility of mutual organization by broadcasters of a service for themselves similar to that which the newspapers have for their use in the press associations, which would furnish programs of national events and arrange for their transmission and distribution on some sort of a financial basis just as the press associations gather and distribute news among their members.

Going into the licensing by the government of super-broadcasting stations, with strength of five times and more of that of the present largest stations, the secretary declared that nothing must be done to interfere with the programs of local stations on which so many of the radio public depend, nor with the wide selective range they now have.

CO-OPERATION PLEDGED.

Recommendations, embodying the views of newspaper publisher-radio broadcasters, were submitted to the conference here today after a meeting, called by Walter A. Strong, chairman of the radio committee of the American Newspaper Publishers' Association.

Its resolutions committee opposed removing present restrictions on the power of stations; pledged co-operation in the broadcasting of events of national importance, as suggested by Hoover; expressed its belief that listeners are "opposed to any form of direct advertising by radio"; and agreed that the department of commerce be vested with authority to compel stations to eliminate "all harmonic transmissions and to maintain in constant use a frequency indicator approved by the bureau of standards."

The committee pledged the publishers broadcaster to a program of education, "to instruct the listener-in to avoid unnecessary interference caused by certain receiving sets," and for the benefit of future radio broadcasting development recommended that "at least ten per cent of the wave lengths below 150 meters be set aside for special use by broadcasting stations."

Pittsburgh Sun
Nov. 4, 1924

RADIO GROWTH IN FOUR YEARS IS EXPLAINED

Start, Newspaper Activity and Scientific Development of Local Station Told.

RECOGNITION IS INSTANT

The astonishing progress of radio in all its branches, broadcasting, receiving and equipment, was explained last night in a program celebrating the fourth birthday of the Westinghouse radio station KDKA.

It was explained by speakers, pioneers in the present broad field of radio, how the local station was started, and how, at the present moment, it is the dispenser of the latest news and programs of music and speeches to millions of people in cities and remote parts of the country.

H. P. Davis, vice president of the Westinghouse Electric and Manufacturing Company, admitted to be the father of radio broadcasting, described the phenomenal advancement of radio during the past four years; A. E. Braun, president of The Sun Publishing Company and The Post Publishing Company, told of the part played in this progress by the newspapers; Eugene L. Connelly, manager of the Davis Theater, described the theatrical phase in radio broadcasting, and Frank Conrad, radio engineer and expert, detailed the scientific development of radio.

ACCEPTED BY PUBLIC.

Mr. Davis viewed the public's acceptance of radio today as they accepted the telephone, electric light and other conveniences, whereas four years ago, they knew scarcely anything about the science at all.

"No other contribution of science has received such spontaneous recognition," he said. "The public was slow to welcome the advantages of steam or electric transportation; the telephone was looked upon by most people suspiciously for years and years; only in slow and measured steps did lighting by electricity receive public support. Briefly, this reflects the great public interest in this newest of the contributions of science."

"The newspaper is the natural patron of radio broadcasting," declared Mr. Braun in his address. "It was not an accident that the idea of broadcasting was born in a newspaper office, just as it was not an accident that radio was born in Pittsburgh. Each development we now see seems to have been logical, almost inescapable. From the vantage point of four years, crowded with successive thrills of brilliant achievement, it is difficult to conceive how Pittsburgh could have failed to be the birthplace of radio or how a newspaper office could have failed to sponsor broadcasting.

PAPER IS LEADER.

to dictate to newspapers a desire to discourage radio broadcasting of news, in order that the people might be kept completely dependent upon the public prints. But the modern newspaper can not afford to be guided by narrowness and pettiness. The modern newspaper is a public institution, and, if it would be worth its salt, must be prepared to serve the people generously and unselfishly wherever opportunity affords.

"For The Pittsburgh Post, as the pioneer in radio broadcasting, the past four years have been years in experiment, and of daring advance and romantic adventure. Success beyond anticipation has crowned the effort, and upon the substantial foundations now laid, The Pittsburgh Post will carry on its radio broadcasting as it has for more than four score years in the publishing of news."

The manner in which theatrical shows, almost in their entirety, including the music, voices, dance steps and applause of the audience, were sent out over the air waves to vast audiences, was explained by Mr. Connelly. He spoke of the first experiment in this department, when the Westinghouse Company "cut in" on the Davis Theater from the studio of The Post at 9:40 o'clock on the evening of Monday, May 9, 1921, and broadcast the acts over the country.

TELL PEOPLE BIG JOB.

Mr. Conrad suggested it is likely that many people today were getting results from the same receiving sets they used in 1919 and 1920 to "pick up" his experimental station, 8XK, and declared that the radio transmitter used at 8XK at that time was, with the exception of power, practically the same as the one used now in transmitting programs.

"To start the world listening-in, to tell the people how to tune in, was the first step in the popularization of radio," said J. C. McQuiston, director of publicity of the Westinghouse Electric and Manufacturing Company. "I thought of the newspapers as the only

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Pgh. Sun 12-1-24

Pittsburgh on the Air.

It can not be said that the week of international broadcasts constituted a triumph for radio. Only an occasional British or European station reached America. Few American stations reached the old world consistently and with sustained power. Insofar as the demonstration may have been intended to prove the feasibility of tuning in across the Atlantic confidently, by the owners of typical household sets, it was a failure. But insofar as the experiments were designed to indicate grounds for hope that the day may soon come when inter-continental broadcasting will be a commonplace, it was a great success.

Chiefly responsible for this hope is the splendid performance of KDKA. The achievements of the great Pittsburgh station in reaching Europe repeatedly, almost at will, with its short waves, are well known. But during the past week the power and brilliance of KDKA's work stood out because of the circumstance of its friendly competition with many other broadcasting stations. Press reports from Britain and Europe concur that KDKA was preeminent in reaching Europe. Not only was this station heard in Britain, but was re-broadcast.

Further tests of international broadcasting are desirable, and should command wholehearted support by all American stations. Regrettably, some of our broadcasters transgressed upon the hour allotted Europe, with the result that many listeners-in were annoyed and disappointed. Another time, perhaps, such lack of consideration may be avoided.

Pittsburgh Radio C[...]t Is Relayed to India

LONDON, Feb. 29.—A concert broadcast by station KDKA, Pittsburgh, Pa. last Saturday night and relayed from London was heard clearly for thirty two minutes in Calcutta, India.

This information was contained in a cable from the Calcutta *Statesman* to its London office.

Pittsburgh Post
Dec. 28, 1924

Dear Sir—

You will doubtless be interested [to] learn that we received a great par[t of] the program broadcast by KDKA Saturday night last, 15th inst. [Our] receiving set is home-made, and c[on]tains one detector valve only, [the] transmission being put through [two] amplifying valves of another [and] was quite clearly heard on [a] loud speaker. The aerial used [is] under rafters carrying tiles in [the] house, at above address, and is [in]doors. Wave length of receiver [...] ters. The announcer of the KDKA [was] heard to give the first item of program at 1 a. m., Greenwich time, [Sund]ay morning, 16th instant, as Overtu[re] Zampa, played by Westinghouse Em[]ployes' band. The overture was [re]ceived very well, especially the [cor]net solo.

The name of following music [...] by the band was not heard, but [this] se[]lection was known by the listener but could not be named. At [...] m. an address was announced [...] given by Mr. Davis, vice president [of] the Westinghouse Company, on the an[]niversary of opening of KFKX. Th[e] address on radio broadcasting on [...] wave length was well received.

The next item was, we believe, Span[]ish dances by Moscowski, played by the band, followed by baritone solo [by] Robert Cole, at the piano Frederic Lyon. Name of song not clear, but [we] believe written by Gounod.

A duet followed, cornet and eupho[]nium or trombone, with band. The an[]nouncement was not clear, but th[e] transmission quite good, especially th[e] triple tongueing on cornet. This abou[t] 1:45 a. m.

LOGGED PROGRAM.

At about 1:48 a. m. a selection by the band was heard, including [...] solo and numbers from Les Cloches de Cornville, but again we did not detec[t] title announced. The announcement was next received that this concluded first part of program and usual "One moment, please." This about 2 [...] a. m. It was then announced that they were going over to the auditorium for speeches, etc., but the conditions changed for the worse and only odd words of the speakers could be detect[]ed. It was perfectly clear that we were listening to speeches, but owing to the echo in what was most likely a large hall, and the fact that a land line was being used to station, it was impossible to follow what was being said or to gather what was the occasion. The attempt was purely amateur enterprise among a few friends. Both sets used were home-made manufacture, and results most gratifying, providing that our report is in accord with the actual transmission from KDKA on Saturday night last.

Perhaps you will kindly assist us by confirming the items and pointing out discrepancies.

Yours faithfully,

HARRY BEALE,
1 Princess Road, Bournemouth, W. England, November 20, 1924.

ILLINOIS ATHLETIC CLUB MAGAZINE, DECEMBER 1924.

Radio Service to Public Much Improved

By WILLIAM J. CLARK
Radio Editor

TENS of millions of people, seated comfortably in their homes in every community of the United States, or at their clubs or in the theater received the result of the nation-wide balloting by radio election night. Before they retired for the night, they knew in a definite way the national, and in many instances the state results.

It was the climax of radio's service to the public.

Even on the Twentieth Century trains flying westward from New York to Chicago, and eastward from Chicago to New York, the passengers seated in the club cars were given the broadcast of the election results. This too was the climax of experiments with radio reception on fast trains.

Radio has succeeded in conquering all fields open to it up to the present, and it is a safe prediction that as new avenues of activity and service are found they too will be conquered.

The election night's demonstration of the great service radio broadcasting offers the public has a significance beyond just that. That night marked the fourth anniversary—in event if not exactly in date—of the opening of the first radio broadcasting in the United States, Westinghouse station KDKA at East Pittsburgh.

The previous presidential election fell on November 2, 1920, and on that night KDKA went on the air for the first time, and the program broadcast included some returns of the election of the late President Harding. In comparison with the returns broadcast November 4, this first service was of course meager and probably heard by a few hundred listeners at most.

The opening of KDKA and the start of radio's popularity—for without broadcasting there would be no reception—was the result of the meeting of genius and vision. Frank Conrad, chief engineer of the Westinghouse Electric & Manufacturing Company, and a radio expert during the war, had been experimenting at his home near Pittsburgh with a miniature sending set, broadcasting records and other canned music to a few radio friends.

Vice President H. P. Davis of Westinghouse learned of this and investigated.

"If this thing will work for a few, it will work for thousands," he said. "We will do this in a big way and let the nation hear."

Mr. Davis, acting on his inspiration, caused Westinghouse KDKA to be erected. He is called "The Daddy of Radio."

The first radio party ever held was attended by a small anxious group of friends of Mr. Davis and Mr. Conrad on election night four years ago, November 2, 1920. KDKA did its first broadcasting that night. In the light of present-day radio, all present admit it wasn't much of a program.

But it was a start, and the wonderful progress that radio transmission and radio reception has made in the four years that have intervened is indeed marvelous.

Today there are more than 550 radio broadcasting stations in the United States, so many and so well distributed that it is reported by the Washington authorities that there is scarcely a point in the country that using an inexpensive one tube set is out of range of some station. The estimates of the number of listeners range from 10,000,000 to twice and three times that number.

November is peculiarly the month of radio.

H. P. DAVIS, VICE-PRESIDENT WESTINGHOUSE ELECTRIC CO.