

During the technology development phase of the early twentieth century, there was a lot of competition, a lot of confusion and debate about what newly developing technologies made possible and what they meant. It was a period of intense innovation as well as confusion, and there was a lot of excitement about it.

A. Telephone

At the opening of the twentieth century, Bell's¹ fundamental patents had expired,² and the telephone industry was very competitive. There were just about as many Bell and non-Bell (independent) telephones.³ There was more innovation and growth in independents because in some ways they had better access to capital. Bell was woefully undercapitalized to compete with them. It was set up at that time as a national entity that raised its capital for its entire industry in one place.

During the next 20 years, Bell substantially consolidated its monopoly position. The Bell system reorganized itself Dec. 31, 1899 with AT&T as the parent company and changed its parent company from its Boston based company to a New York City based company with better access to New York capital markets. So the signal event of telephone was the Bell system's recognition of its capital needs and subsequent reorganization to remain the predominant national telephone company. Very shortly after that,⁴ AT&T turns to New York syndicates for funding. They had a new syndicate led by JP Morgan and Morgan gains 2 - 3 seats on the AT&T board, former management is replaced and Vail is brought in to be CEO in 1905.

1. Theodore Vail

The telephone business in the first 20 years is mostly about Theodore Vail, who became CEO of AT&T in ___ and structured the Bell system. Vail was a systematizer. He believed in tight organization - every engineer had the same training materials and equipment everywhere across the country. [Other examples of tight organization would be useful] Decisions to expand were done in light of consistency. [What does this sentence mean?] Theodore Vail created the Bell system and made it a bureaucracy run by bureaucrats and enabled the company to deliver good service very well and become a very powerful entity. [How did his reorganization allow AT&T to become powerful? One doesn't necessarily flow from the other] AT&T basically provided better telephone service. They used that position to get the government to grant it preferential powers [such as?], which lead to the consolidation of their monopoly. So the telephone business is for the first 20 years substantially T. Vail.

Vail built AT&T into the Bell system, turning the company into a national organization that was centrally managed. He was able to buy and build equipment with large economies of scale and build uniform practices, pay schedules and rates on a

1 We need to be accurate here with our usage of "Bell" and "AT&T."

2 They expired in 1893 or 1894.

3 How many of each? - *think*

4 Insert date

Can we put footnotes #'s in bigger font? Red?

less screaming?

qualify accurately

X

built

& exec

national basis. Vail also created the regulatory framework,⁵ first in the states and then nationally and ultimately at the FCC. This was a really successful intellectual scam. When encouraging and arguing for a regulatory scheme in a state, Vail insisted that the telephone business was inherently a monopoly business. It was naturally a monopoly and as such it had to be regulated because competition really wasn't feasible in the phone business and you had to have regulation to serve the public interest. That line he began articulating in the annual reports of AT&T in about '07 / '08. In the 20s, while Vail is building AT&T on this monopoly framework, the independent phone companies became more forceful, and Vail began arguing that the monopoly of the phone company was a good thing for society. Because of the good things that AT&T did and could do because of its monopoly, Vail asserted, regulation was needed to protect AT&T from competition. But those two ideas are fundamentally incompatible. A natural monopoly is an industry where competition isn't feasible. If you're a natural monopoly, why do you need protection from competitors?⁶ Nonetheless, this idea continued until the 70s when the Nixon Administration's Office of Telecommunications Policy worked to undermine that rationale.

& who else? Bruce Owen here.

Vail's mantra – one system, one policy, universal service – was aimed at the switchboard problem. When Vail coined the term “universal service,” he meant that everyone should be on the same system, a nice word for monopoly. The phrase eventually came to mean that everyone in the country should have a telephone.⁷ Vail thought that there should be one monopoly phone company because he believed that was the best way to develop a robust phone system in US.

↖

And then after WWI, Vail's successor Gifford consolidates the natural monopoly structure that Vail had promulgated and makes some peace with the independents.

B. Radio Broadcast

thought of it.

Radio as we know it – as broadcasting – didn't happen until 1920. There was a lot of innovation in wireless and a lot of excitement about it – first wireless telegraphy and then wireless voice. But wireless voice was thought of as wireless telephony. For unexplained reasons no one really thought of wireless voice – radio – as a broadcast medium. Everybody saw it as a way to provide telephone service without wires. The thought of radio as a conduit for information and entertainment really just came out of the blue in 1920 and took off in a big, big way across the country starting in 1921.

There are three characters in the radio broadcasting story: H.P. Davis, Bill Paley, and Herbert Hoover. By the latter part of 1920s or 1930s, it had pretty much consolidated into a national system of radio stations and 3 radio networks. This was the predominant structure of radio and played an important role in creating a new thread in American mass culture. It also brought in a new dimension in advertising, which then

⁵ Did he also coin public interest, convenience, and necessity?

— doubt it. ICC legislation? Hoover?

⁶ Bruce Owen's recollection was different -- Tom doesn't remember exactly, but it had to do with the time Vail said something.

Need to research?

⁷ This happened around time of 34 Communications Act.

carried over to the regulatory structure of T.V. broadcasting and became the primary industry structure for radio and television broadcasting news and entertainment pretty much as a monopoly through 1970s and then as a predominant factor into the 80s and 90s. But these three individuals' contributions formed an industry structure that carried over for a very long time. Collectively, the stories of these three individuals explain the creation and consolidation of the radio broadcasting business.

Do we want to do this? ?

1. H.P. Davis

H.P. Davis at Westinghouse simultaneously developed radio broadcasting and the consumer electronics business.

A

still wireless? navy?

Davis's contribution began in 1920 with Frank Conrad's experiments with voice transmission by wireless. Conrad worked at Westinghouse in Pittsburgh as an engineer originally on transmitters, but later on other assignments as demand for transmitters declined. Captivated by wireless, however, he created an amateur radio station - 8MK - at home, where he experimented with different ways of voice transmission. He solicited reports from people as to when they heard his station, how clear it was and how strong it was. Since he didn't want to talk all the time, he started playing phonograph records, he had his sons play piano, and had various people come by to talk. People sent him postcards, not only about the signal quality, but also asking for certain records to be replayed. At that time, there was no business of building radio receivers so the people who heard Conrad's transmissions were largely amateur tinkerers like Conrad who built their own receiver. Many were American boys who for some reason had an interest in radio. Increasingly, Conrad received cards solely about the content of his programs and unrelated to the technical aspects.

Sometime in 1920, H.P. Davis sees an ad in one of the Pittsburgh newspapers that the Home department store is selling radio receivers⁸ for people who want to listen to Conrad's radio transmissions. At that moment, H.P. realizes that, since Westinghouse builds radio equipment, it could sell radio receivers and it could sell more of them if it had a regular broadcast of entertainment and news material. So, he decided that Westinghouse should set up a station that has more power than what Frank Conrad has, which would create an audience of people to buy its receivers. So H.P. gets Conrad and other people at Westinghouse to build a more powerful transmitter on top of the Westinghouse plant in Pittsburgh and applies to the government for a license, which it grants. Until Westinghouse's application, no one had applied for a license for this purpose so the government came up with a way to give this license, and Westinghouse's station became KDKA.

This moment sparked the creation of the radio broadcasting industry (which later became the television broadcast industry) and the consumer electronic industry. The radio broadcast industry needed interesting radio broadcasts to encourage people to buy their technology.

⁸ Who built those radios?

H.P. gets Westinghouse to build this radio station and start a program of news and entertainment and starts selling radio receivers. So H.P. starts the station, he presumably starts building radios, and he builds a number of other stations around the country, from the midwest to northeast. Those were the first radio broadcast stations and most of those stations still exist today. WHDH in Boston and WABC in NY. In any event he starts a number of radio stations and starts making radio receivers. At this point, RCA comes into play because Westinghouse is part owner of RCA and has patents which came to be called the radio trust. Davis fairly quickly agreed to make RCA the sales arm for selling radios to the public. An agreement emerges that GE would manufacture 60% of radios sold and Westinghouse would manufacture 40%.⁹

*why?
Because of
GE?
date; actually
as SM x??*

KDKA made its first transmission on election night in November, 1930. A few weeks later it began its regular radio broadcast, and radio as we know it emerges. Amazingly, no one had thought of this before. Though Fessenden transmitted a Christmas program, and someone on the West Coast was producing regular transmissions, they weren't thinking about making this a commercial proposition. It was either a publicity stunt (Fessenden) or personal hobby (West coast guy), not an attempt to stimulate radio sales to the general public.

A

→ More on radio phenomenon; ground.

H.P. largely disappears until 1926 when NBC is formed as a national broadcasting company, a network owned by RCA, and H.P. becomes NBC's chairman of the board.¹⁰ NBC crystallized the formation of a national network – a network provided for by AT&T.

Hoover should be #2
32. Bill Paley

In the development of the networks, the characters are Owen Young at GE, Robert Sarnoff at RCA, and Bill Paley at CBS. The primary actor is Bill Paley. The three stories here – radio, the development of the networks (not sure who the actors are there), and the development of advertising on the networks as we know it (Bill Paley) – carries us up to the early '30s, when the '34 Telecom Act which consolidates the structure of the radio broadcast business.

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After NBC is created, Paley picked up on the network idea and started CBS. Unlike NBC, which was owned by RCA, a company that manufactured radios, Paley's CBS did not create radios. NBC was justified partially on the grounds that it helped sell RCA radios and partially on the AT&T model of selling sponsorships.¹¹ Paley had to make radio broadcasting a revenue producing business apart from the promotional value of selling radios and jumped into selling sponsorships and advertising. Because he was differently motivated from folks at NBC, he moved more aggressively to sell more direct advertising along the lines of what we know it today rather than the more stately sponsorships that NBC had been using. The different motivations are that NBC was

9 Did Westinghouse sell radio receivers under its own brand for a while? Did it think it was its right to build them, exempt from the patent pool agreement?
10 How much of a role did he have in the creation of NBC? Was creation of the network his idea?
11 Did CBS own any stations? Tom thinks it was Westinghouse and GE that owned stations, not RCA.

justly

expected to do more high class information and entertainment that would reflect well on parent companies and was heavily subsidized by parent companies so it wasn't under same pressure to create a stand alone business unit. So Paley led the way for the development of direct advertising. Maybe even created the model of sustaining programs. Paley sought out performers and program ideas that were more appealing to a large audience.

He built CBS in cooperation with the advertising agencies and major advertisers. He was much more aggressive than Sarnoff at NBC about allowing more and more overt commercialism in advertising.

A big part of Paley's success was that he treated radio as a commercial undertaking.¹² Whereas Sarnoff at NBC held to the view that radio needed to be uplifting and bring culture to the masses, Paley succeeded in making radio broadcasting and in particular network radio broadcasting a viable stand alone profitable undertaking based on advertising. He did that counter to the snobby elite view that this medium of the public airwaves should not be crass commercial purposes. Paley and what he was doing at that time did not mesh with the anglo-protestant perception of what responsible business men did.

Paley brought to the business the idea that you could build a commercially successful broadcast business as opposed to a broadcast business subsidized by the sale of radio receivers. RCA could justify running radio stations at a loss because they'd sell more radios. Paley wasn't in the business of selling radios so he needed to build his network to be economically viable and to do that he was more willing to accept more overt kinds of advertising. In the beginning it was sponsorships, then they started to do product placements - like the klondike ice cream singers. Then advertising crept in. The AT&T sponsorship model at WEAJ may have played a role in this but the important thing about Paley was that he built a third network by developing ways that sponsors and later advertisers could promote their products and brand name. Because of his different motivations than Sarnoff, he was always more aggressive than Sarnoff in organizing his programs so that commercial sponsors could get more and more value out of them and therefore pay more money to him. Over time this model grew into ad agencies developing programs directly in cooperation with the advertisers. Paley and CBS were always at forefront.

Paley built the economic model of the broadcast business as a stand alone successful industry with ads as the fundamental revenue source. This broadcasting model was copied 100% by television and still today most of the networks are advertiser supported.

23. Herbert Hoover

Herbert Hoover is one of the most important guys in the history of early broadcasting because he provided the regulatory mechanism, which is in large part why

¹² Paley's father ran a cigar company - he came from commercial business background.

there are three television networks.)

data continued

The radio act of 1912 said that the Secretary of Commerce must grant a license to whoever wants one. In the 1920s, both the transmission and reception technology was such that it was hard to distinguish between particular frequencies, and as the number of stations grew, there was more and more interference. Hoover at the Commerce Department believed in the cooperation of government and industry. He developed a procedure for granting licenses to broadcast stations subject to certain restrictions. I.e., a station might be able to broadcast with only certain watts of power or only on particular days or times. By working with the applicants for licenses and particular licensees, Commerce was largely able to accommodate anyone who wanted a broadcast station. There was interference, however, particularly at night. So Commerce added more frequencies which required at least new stations to adopt more precise frequency control transmitters. Adding stations with more frequencies required people to buy radios capable of tuning to particular frequencies without much interference, but the people with older radios still encountered interference. Hoover and the industry for the most part sorted that out. Radio grew v rapidly and the public interest grew –radio was an increasingly noticed phenomenon on national landscape.

Then in 192___, McDonald, the president of Zenith, moved his transmitter to a frequency that had been reserved for Canadian broadcast, saying that the government didn't have the authority to restrict it. Commerce sued Zenith, and ultimately the U.S. Supreme Court ruled that Commerce didn't have authority to refuse the company a license.

Long before the suit, Hoover had been asking for Congressional authority for the regulatory apparatus and procedures that he had created, but Congress was never able to get its act together,¹³ either because it didn't think it was urgent or didn't know what to do.

After the Supreme Court handed down its Zenith decision, people felt entitled to do whatever they wanted and began shifting into other frequencies. Hoover's system quickly devolved into a big mess and a previously annoying problem quickly became unmanageable.

tuning?

Finally Congress got it together and created the Radio Act of 1926 which was passed in 1927. The Act provided that there would be a commission for one year to regulate and issue licenses, after which the authority would revert to commerce dept. The commission, however, was extended for several years and in 1929 was made permanent so that licensing was done by the Radio commission. The policies and procedures that Fed Radio Commission had adopted, however, were essentially those that Commerce had

B
Home/Santo
division

¹³ There is some speculation that, frustrated with Congress, Hoover encouraged Zenith to bring suit because he wanted a test case to show that he didn't have the authority to stimulate congress to enact a statute that explicitly governed government regulation of broadcasters.

evolved under Hoover.

The litigation and legislation of this period illustrates that Hoover and most people believed that radio spectrum should not be owned by corporations but by government. There's a lot of reference to the public interest and regulating radio on behalf of public interest.¹⁴

The Hoover story is a story of government regulation of air waves, cooperation with industry and emergence of a sound regulatory scheme under which industry grew and prospered.

One of the key elements of the Hoover policy was that to accommodate all these would-be broadcasters, they adopted a pattern of having high-powered transmitters located in certain areas and medium power located in other areas, low in other areas.

*11 Davis
Amateur?*

The table of allocation sets forth where stations may be located and at what power, which pretty much evolved from the stations that were already operating in the early days. The table also reflected Congress's desire that radio frequencies be equitably assigned throughout country.

can we find?

Under the table, only a fraction of towns could receive 4 or more stations and that's important because when the networks were set up they naturally ran their lines where they could get the most audience. Because the LD rates that AT&T charged were expensive, the networks went to where they could get the most people.

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The first network would go to the most powerful set of stations. The second one would go to the second most powerful, using less powerful stations to fill in their audience. The third network had a different problem – it could go to the biggest cities, but finding other markets where people could hear three stations gets more important. The fifth network had a big problem because it has to run long distance cable to lots of different towns which is expensive and impracticable.

The result is that the first two ^{network} stations evolve quickly, owned by NBC, followed by a third network, CBS, owned by Bill Paley. The assignment of stations and their power around the country was done in a way that was a balance of political pressures and commercial interests to reach the most people. What that produced was a scheme so that everybody could get at least one station. But from a commercial network economics point of view it was economically viable really only to have 3 radio networks. That policy / philosophy of balancing political interests and making sure everyone has radio access and the commercial theory to have more stations for more people was carried into TV with the result that there were 3 network T.V. stations.

11 Kaplan

Hoover created the scheme adopted by the FCC and perpetuated by FRC that

14 Where did "public interest convenience necessity" come from and when was it first applied to radio?

allows commercial broadcasting to grow but constrains it to 3 networks. This gave the 3 networks a lot of economic, political and cultural power that they used in an oligopolistic way which we choose to call a monopoly.

WWI – patents, etc. – how did these come into play and why are they important to our story?

Movies – how did these come into play and why are they important to our story?