

THE POLITICAL SPECTRUM

*From Marconi to the iPhone, the Quest to Liberate
Wireless Technologies of Freedom*

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Washington, D.C.

Dec. 9, 2015



The Political Spectrum

- *From Marconi to the iPhone, the Quest to Liberate Wireless Technologies of Freedom*
- Yale University Press (Spring 2016)

Overview

- Averting Tragedy
- Political Spectrum
- Dueling Regulatory Paradigms
- Liberalization → Proof of Concept

1895, Guglielmo Marconi



But things remained quiet.

Even in 1912.



1920, Broadcasting



Conflicts Emerge



Etheric Bedlam?



Myth Calculation

- Before 1927, the allocation of frequencies was left entirely to the private sector, and the result was chaos.
- It quickly became apparent that broadcast frequencies constituted a scarce resource whose use could be regulated and rationalized only by the Government.
- Without government control, the medium would be of little use because of the cacaphony of competing voices...
 - *Red Lion v. FCC* (1969), echoing *NBC v. US* (1943)

Scarcity unique?

- Before 1927, the allocation of frequencies was left entirely to the private sector, and the result was chaos.
- It quickly became apparent that broadcast frequencies constituted a **scarce** resource whose use could be regulated and rationalized only by the Government.
- Without government control, the medium would be of little use because of the cacaphony of competing voices...

Not so much -- Ronald Coase

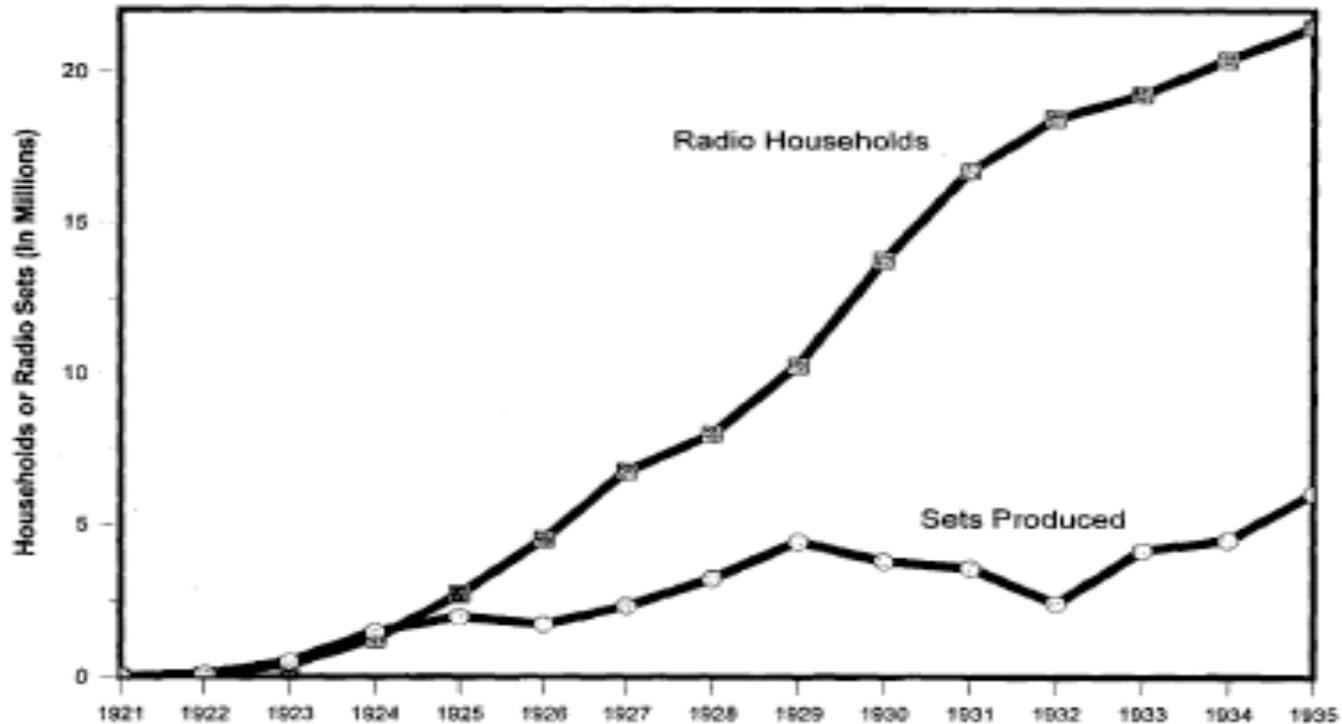


What about the history?

- Before 1927, the allocation of frequencies was left entirely to the private sector, and the result was **chaos**.
- It quickly became apparent that broadcast frequencies constituted a scarce resource whose use could be regulated and rationalized only by the Government.
- Without government control, the medium would be of little use because of the **cacaphony** of competing voices...

in fact, radio was hugely popular.

Figure 2. U.S. Radio Households and Sets Produced
1921 - 1935



Source: U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the U.S., Part 2 (September 1975), p. 789.

“Radio Christmas” (Dec. 1924 issue)



RADIO NEWS (Oct. 1925)



RADIO NEWS (July 1926)



“priority-in-use” as per 1912 Radio Act



Secretary of Commerce Herbert Hoover

Rev. Aimee Semple McPherson



Dec. 9, 2015

Hudson Institute * Washington,
D.C.

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TO SECRETARY OF COMMERCE HERBERT HOOVER:
PLEASE ORDER YOUR MINIONS OF SATAN TO LEAVE MY
STATION ALONE. STOP.

YOU CANNOT EXPECT THE ALMIGHTY TO ABIDE BY YOUR WAVE
LENGTH NONSENSE. STOP.

WHEN I OFFER MY PRAYERS TO HIM I MUST FIT INTO HIS
RECEPTION. STOP.

OPEN THE STATION AT ONCE. STOP.

AIMEE SEMPLE MCPHERSON

Property Rights in Frequencies

System worked well – too well.

- regulators wanted more discretion
 - influence over broadcast content
- incumbents wanted protection from entry
- strategically, Commerce ended enforcement
 - July 9, 1926
- “period of the breakdown of the law”
- demand for regulation grew
 - House and Senate enacted compromise
 - Pres. Coolidge signed Radio Act on Feb. 23, 1927

1927 Radio Act

- “priority in use” → “public interest”
 - pre-empts frequency ownership
 - vests administrative control
- political economy: rent seeking equilibrium
 - incumbent radio stations (entry barriers)
 - incumbent policy makers (influence over content)
 - platform for rent creation, distribution
- 1920s radio market → frequency allocation today
- no alternative?

Average and paid circulation of THE CHICAGO TRIBUNE October, 1926
 Daily - - - 768,891
 Sunday - - 1,157,635

Chicago Daily Tribune

THE WORLD'S GREATEST NEWSPAPER

FINAL EDITION

VOLUME LXXXV.—NO. 277 C FROM U.S. PAT. OFFICE, COPYRIGHT 1926 BY THE CHICAGO TRIBUNE THURSDAY, NOVEMBER 18, 1926.—38 PAGES THIS PAPER CIRCULATES IN THREE SECTIONS—SECTION ONE *** PRICE TWO CENTS IN CHICAGO AND SUBURBS ALABAMA, FLA. CENT.

INDICT A MUNICIPAL JUDGE

NICARAGUA ASKS U. S. AID AGAINST MEXICAN REDS

Gun Running Brings Kellogg Warning.

Washington, D. C., Nov. 17.—(AP)—The signing of a Mexican-brokered but vital agreement intervening between the United States and the Panamas and has thrust itself into American foreign relations, already strained. This striking development, which has been hovering near the surface for several weeks, came to light today with an appeal by Adolfo Diaz, new president of Nicaragua, for American assistance to restore peace in that

Court Fixes Radio Rights on Air; W-G-N Wins

NEWS SUMMARY

LOCAL
 Judge Henry M. Walker and Capt. Prindleburg included in the list of 24 indicted in U. S. run from Italy. Page 1.
 Dyer says District Attorney Olsen's sweeping charge of Chicago corruption is unfair and unwarranted. Page 2.
 Judge Wilson decides W-G-N has property right in broadcast radio program without interference by stations with similar wave lengths; refuses to dissolve injunction; sets precedent for U. S. Page 1.
 Heavy snow takes toll of three lives in Chicago; more snow and colder today. Page 1.
 Boardman's protective committee predicts responsibility for surface losses; tender losses approved by state commerce commission. Page 2.
 Public business halted as city and county pay tribute to Patrick J. Carr; Jacob Lindheimer to complete insurance. Page 3.

WAVE LENGTH DECISION SETS U. S. PRECEDENT

Aerial Property Rights Defined.

The decision of Judge Wilson, said to be the first to deal with rights of broadcasting through the air, is printed in full on page 18.
 BY PHILIP KINSLEY.

DEMOCRACY PROVIDES AN OBJECT LESSON TO ROYALTY



Ileana Safe After Shakeup in Auto Crash

RUCEN MARIO'S TRIP EN ROUTE TO LOUISVILLE, KY., Nov. 18.—(AP)—Queen Mario will abandon her American tour at Detroit on Saturday because of the serious turn in the condition of King Ferdinand. She will arrive in New York Sunday morning, and expects to sail on Nov. 21 on the Boregaria. Mario authorized this statement early today. Summoning Col. John H. Carroll, in charge of the train, she said the news from Bucharest was discouraging.
SAD OVER KING'S HEALTH.
 Indianapolis, Ind., Nov. 17.—(AP)—Queen Mario of Rumania, 26, left for

U. S. RUM NET LANDS WALKER AND CHIEF'S AID

Grand Jury Names Seventy-four.

BY EDWARD BURKE.
 (Finishes on back page.)
 Seventy-four Chicagoans, including Municipal Judge Henry M. Walker and Police Captain John Prindleburg, testify to Chief of Police Morgan A. Collins, from the second group of officers Volstead selected in the federal program to indict 1,500 persons in Alton county public before New Year's day. Walker, Prindleburg and the other

Aerial Property Rights Defined

- For the first time a court declared yesterday that property rights may be created in the air, and that the rules of common law may be applied to them.
- The conception of the air as a free commons was declared unsound.
- This decision, which has been awaited with keen interest by radio broadcasters and lawyers all over the country, enjoins the Oak Leaves station from broadcasting over a wave length near to The Tribune station to interfere with programs.
 - Slightly edited version of *Chicago Daily News* story (11.12.26)

The Political Spectrum

Top-Down Rules to Prevent Tragedy

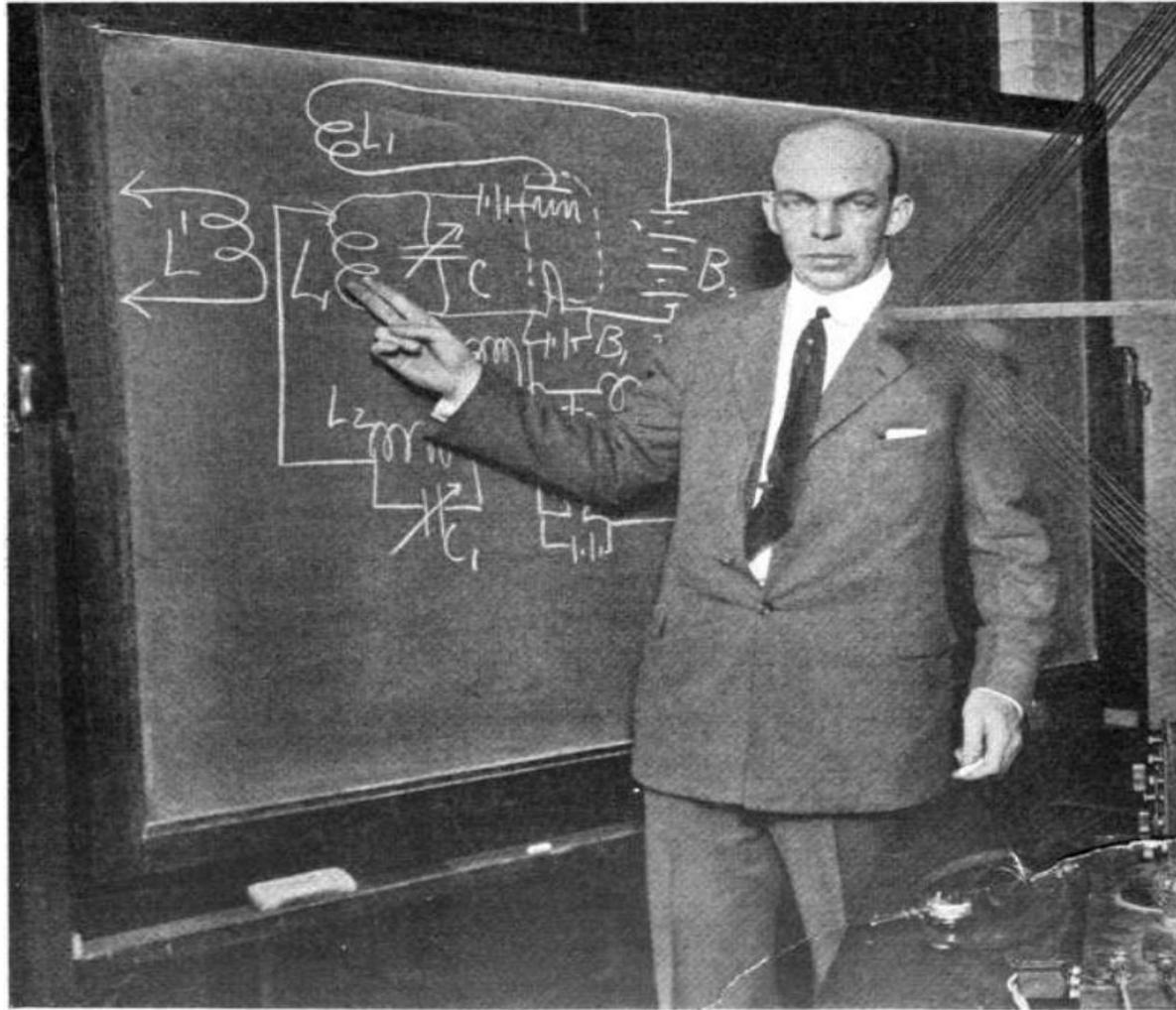
- regulator determines wireless
 - services
 - technologies
 - business models
 - ownership
 - content rules
- restricted entry *and* rivalry between firms
- tax on innovation: *Mother May I?*

Silence of the Entrants

Silence of the Entrants

- Maj. Edwin Howard Armstrong
- Dumont Television Network
- LPFM Radio

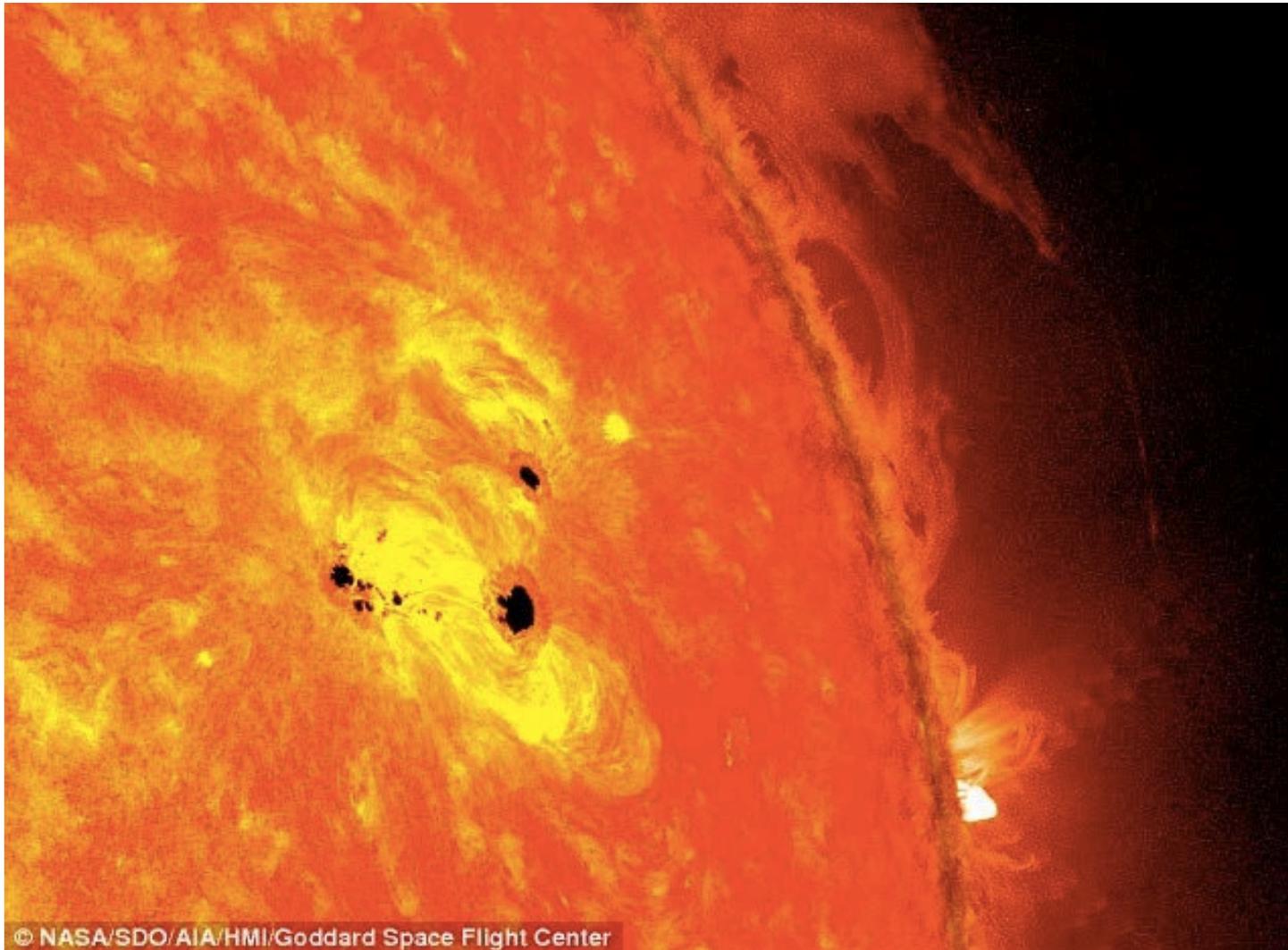
Prof. Armstrong (1922)



Gave his bride a Boom Box (1923)

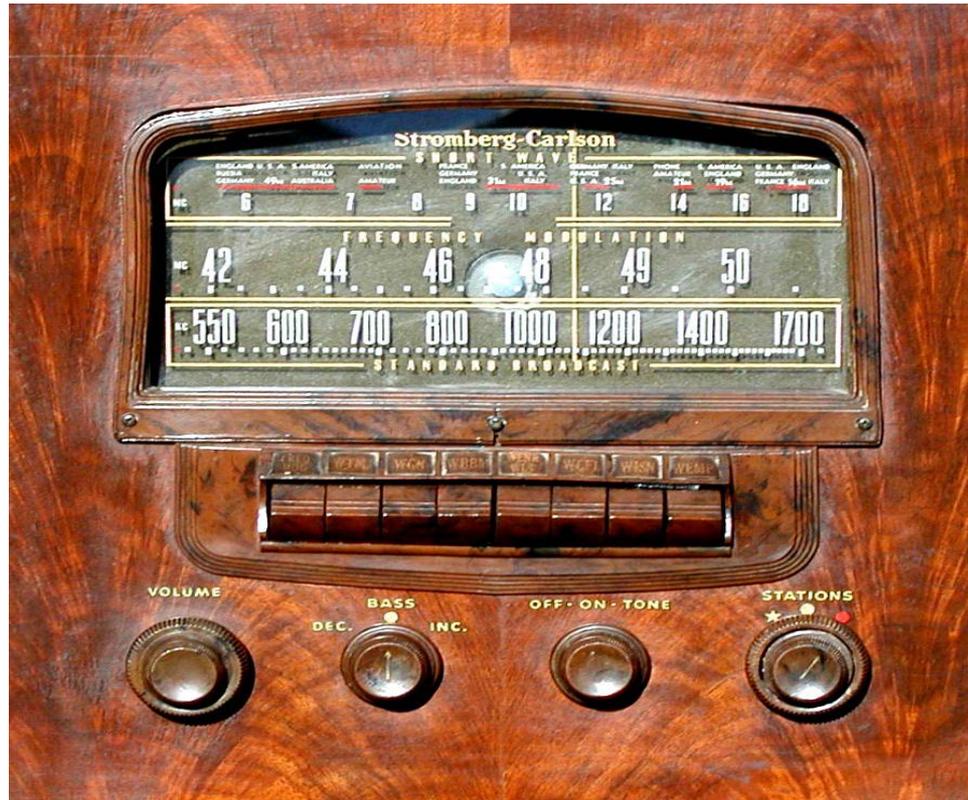


Fell victim to Sunspots



© NASA/SDO/AIA/HMI/Goddard Space Flight Center

Channeling a Dead Zone



TV Pioneer Allen Dumont launches Broadcast Network (1946)



Localism reduced competition



Dumont TV, R.I.P. (1955)



Low Power FM Radio (1998-2001)

- 100,000 slots
- fewer than 1,000 LPFM radio stations
 - limited to non-market areas to prevent interference
 - tiny audiences
 - non-profit, no ads, no multiple station owners
- killed by its foes or advocates?

But 30,000 FULL-POWER SLOTS FOUND IN INVENTORY!

- 2002 → HD Radio
- carved out, and owned, by FPFM licensees
 - incumbents' strategic response to satellite radio
- incentives different, outcomes distinct



“Public Interest” Allocations

- thwart innovation
- protect incumbents
- lead to First Amendment mischief
 - equal time rule
 - Fairness Doctrine
- hostile to economic growth
- garner consensus criticism

Two Regulatory Paradigms

The Vast Wasteland



Newt Minow @ NAB (Las Vegas, May 9, 1961)

- "When television is good... nothing is better.
- "But when television is bad, nothing is worse. I invite each of you to sit down in front of your television set when your station goes on the air and stay there, for a day, without a book, without a magazine, without a newspaper, without a profit and loss sheet or a rating book to distract you. Keep your eyes glued to that set until the station signs off. I can assure you that what you will observe is a vast wasteland."

Wasteland (cont'd)

- "You will see a procession of game shows, formula comedies about totally unbelievable families, blood and thunder, mayhem, violence, sadism, murder, western bad men, western good men, private eyes, gangsters, more violence, and cartoons. And, endlessly, commercials -- many screaming, cajoling, and offending."

Hailed as a Prophet



No new forms

- instead, *Carter Mountain* (1962)
- common carrier microwave license denied—because of the content they would carry
 - worried about “audience siphoning”
- FCC *Lebensraum*
 - “ancillarity”
- blocks cable to protect “public interest” in TV
 - broadcast news, public affairs, educational programs
 - “The news from nowhere” (Edward Jay Epstein)

“The Vast Wasteland Model”

A Competing Policy Paradigm

Mark Fowler (Interview in *Reason*, 1981)

- "Television is just another appliance. It's just a toaster with pictures."

Mocked and Derided



Minimalist Regulation

- Cable TV deregulation already underway
- 1985 → relaxing constraints in unlicensed
 - low power, local area (Wi-Fi, Bluetooth)
- 1988, 1993 → relaxing constraints in licensed
 - included license auctions (USA, after NZ, India)
- Liberal licenses → delegates to “tiny FCCs”
 - market allocates spectrum
 - competing networks manage interference
 - offer rival architectures, business models, services

20 Year Performance?

TV Networks: “Public Interest”



Broadcast TV Networks (1945)



Broadcast TV Networks (1965)

20 Years of Technological Progress

TV Set Progress, 1941-1961



© 2002 TVhistory.TV Library

GE Model 90 – 12" (1941)



RCA First Color + Remote (1961)

In Comparison

TV Set Progress, 1941-1961



© 2002 TVhistory.TV Library

GE Model 90 – 12" (1941)



RCA First Color + Remote (1961)

Cellphone Progress, 1987-2007



Nokia's first mobile handset (1987)



Apple iPhone (2007)



FIG. 1.1. PUBLIC INTEREST VS. TOASTERS: TV SETS & CELLPHONES

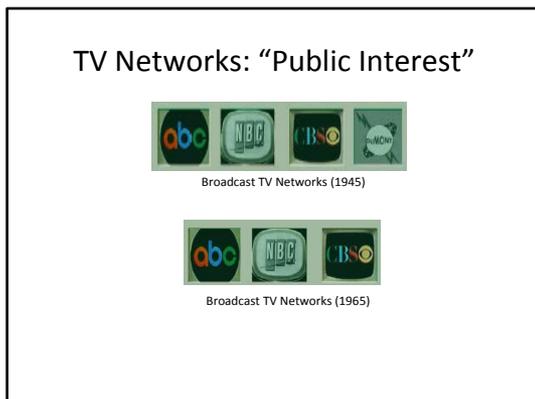


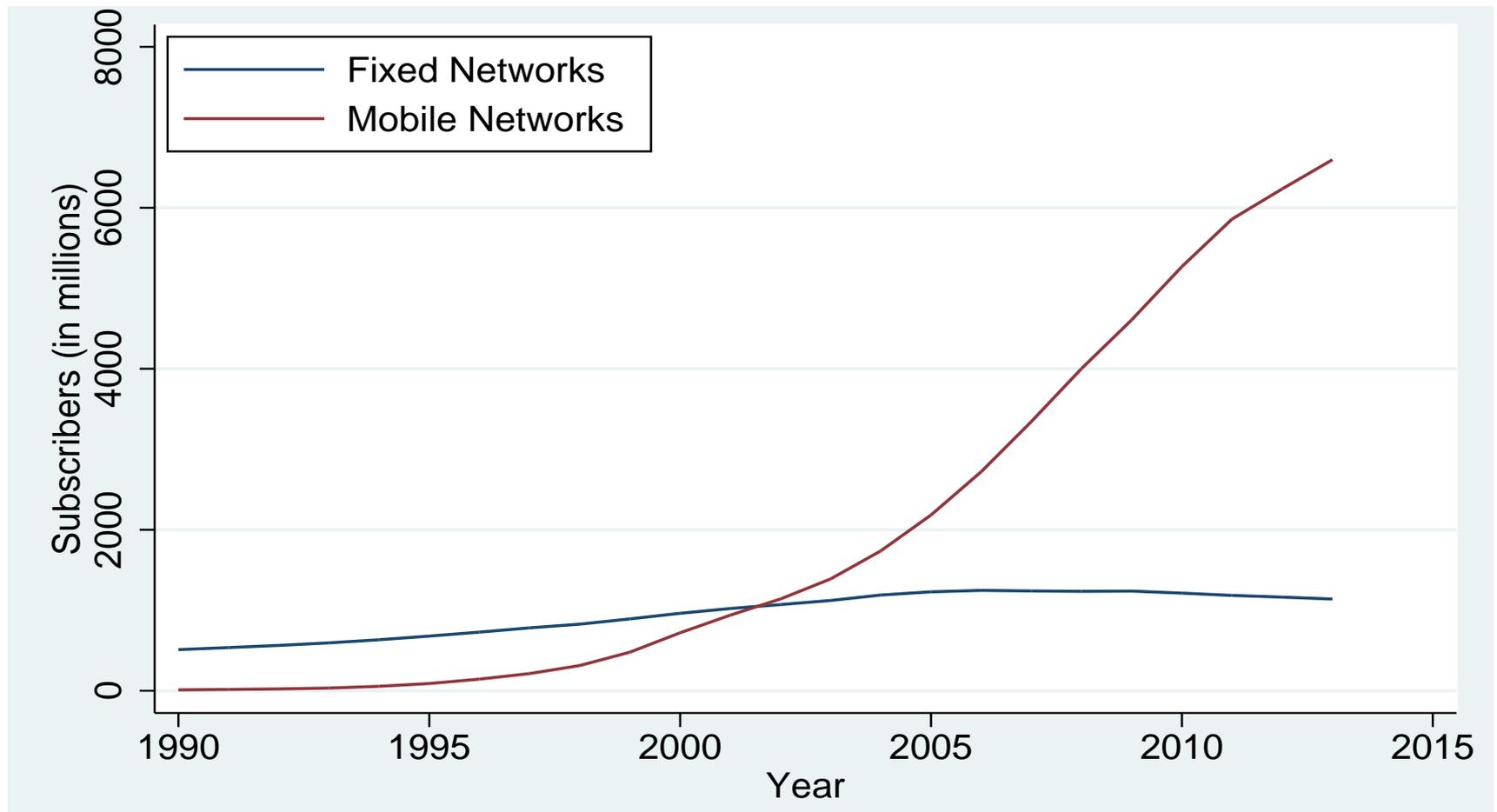
FIG. 1.2. PUBLIC INTEREST V. TOASTERS: TWO DECADES OF TELEVISION NETWORKS

1973, mobile cellular





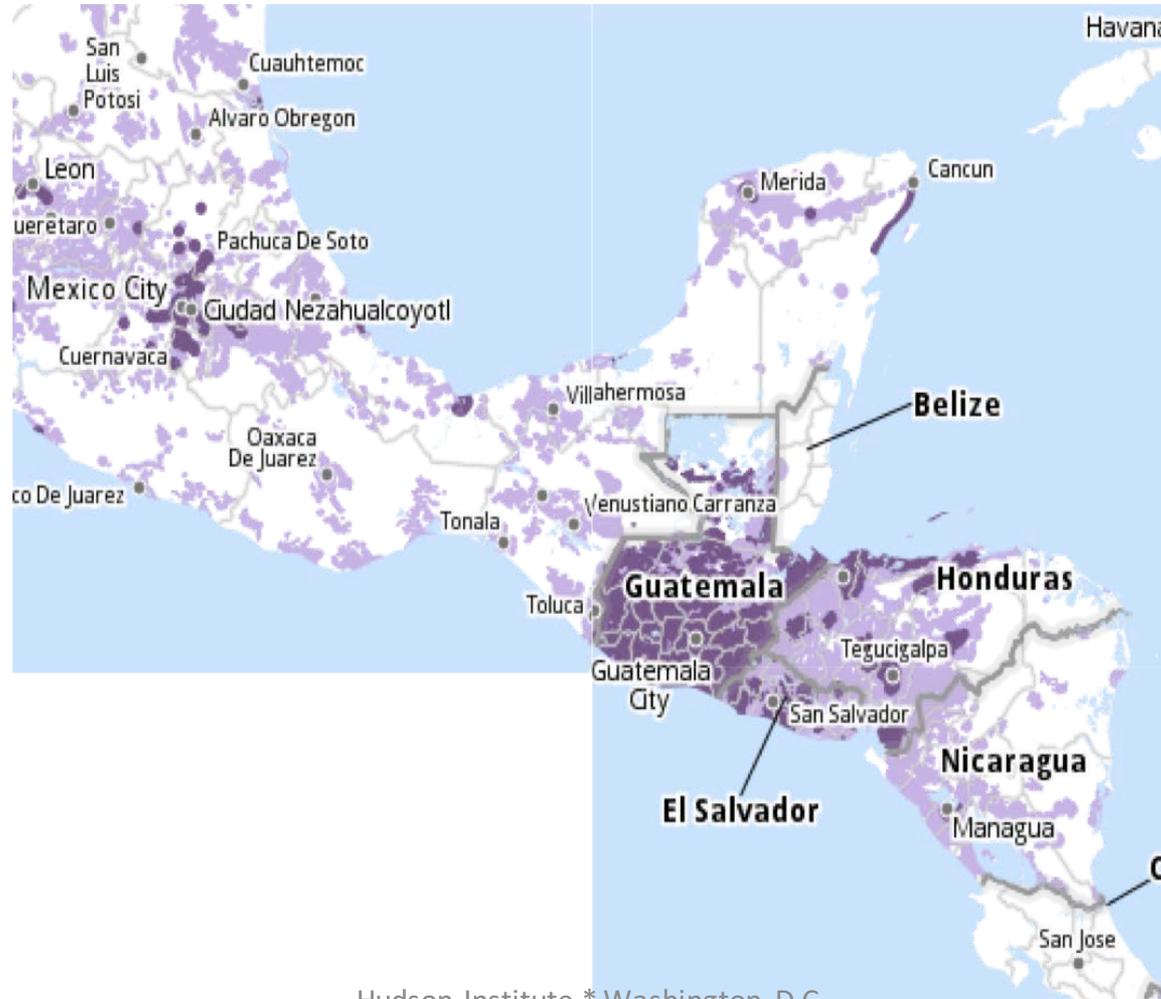
Wireless: Zero to Dominant in 20 Years



TUFs: ULTRA-LIBERAL TITLE TO THE USE OF AIRWAVES IN GUATEMALA

No. Orden:	No. Registro:
LA SUPERINTENDENCIA DE TELECOMUNICACIONES DE GUATEMALA	
Con base en el Artículo 57 del Decreto 94-96	
Otorga el Presente	
Título de Usufructo de Frecuencia	
A:	
<hr/>	
<i>Banda o Rango de Frecuencias</i>	:
<i>Horario de Operación</i>	:
<i>Potencia máxima efectiva de radiación</i>	:
<i>Máxima intensidad de campo eléctrico o potencia máxima admisible en el contorno</i>	:
<i>Fecha de Emisión</i>	:
<i>Fecha de Vencimiento</i>	:

AMAZON KINDLE INTERNATIONAL COVERAGE MAP, OCTOBER 2010



Central Controls Still Impinge

- liberal licenses can allocate bandwidth
- but only small fraction of spectrum available
- quest now is to improve that fraction
- brute force → regulators push more out
- policy innovation → incentive auctions, overlays
- deregulate the deregulation -- Fred Kahn

Incentive Auctions

- a key policy pivot
- government is buying back its own licenses
- concedes “public interest” misallocation
- advantages of streamlined strategies
- Overlays for all 49 TV channels (294 MHz)
 - FCC inclusion of “impairments” a concession to overlays
 - Use auctions to assign licensed or unlicensed MHz rights

Overcoming 6-13 Year Delays (FCC 2010)

**TV Band
2009-present**

49 Channels
(294 MHz)

Overcoming 6-13 Year Delays (FCC 2010)

TV Band 2009-present	FCC 2010 Plan
49 Channels (294 MHz)	120 MHz suitable for mobile in 2014-15
	New statute and auction process created delays.

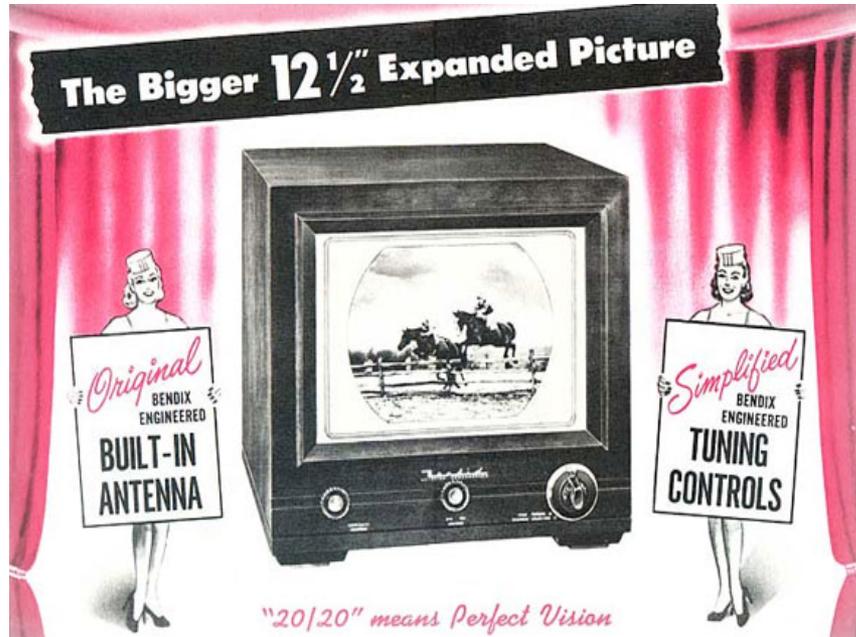
Overcoming 6-13 Year Delays (FCC 2010)

TV Band 2009-present	FCC 2010 Plan	FCC 2015 Plan
49 Channels (294 MHz)	120 MHz suitable for mobile in 2014-15	70 MHz suitable for mobile In 2019
	New statute and auction process created delays.	Incentive Auction launch scheduled March 29, 2016

Overcoming 6-13 Year Delays (FCC 2010)

TV Band 2009-present	FCC 2010 Plan	FCC 2015 Plan	Overlays 2010 Plan
49 Channels (294 MHz)	120 MHz suitable for mobile in 2014-15	70 MHz suitable for mobile In 2019	294 MHz suitable for mobile and other applications
	New statute and auction process created delays.	Incentive Auction launch scheduled March 29, 2016	\$3 billion could switch 10 mm HHs to DBS. Off the shelf policy technology

Progress in quality-adjusted MHz

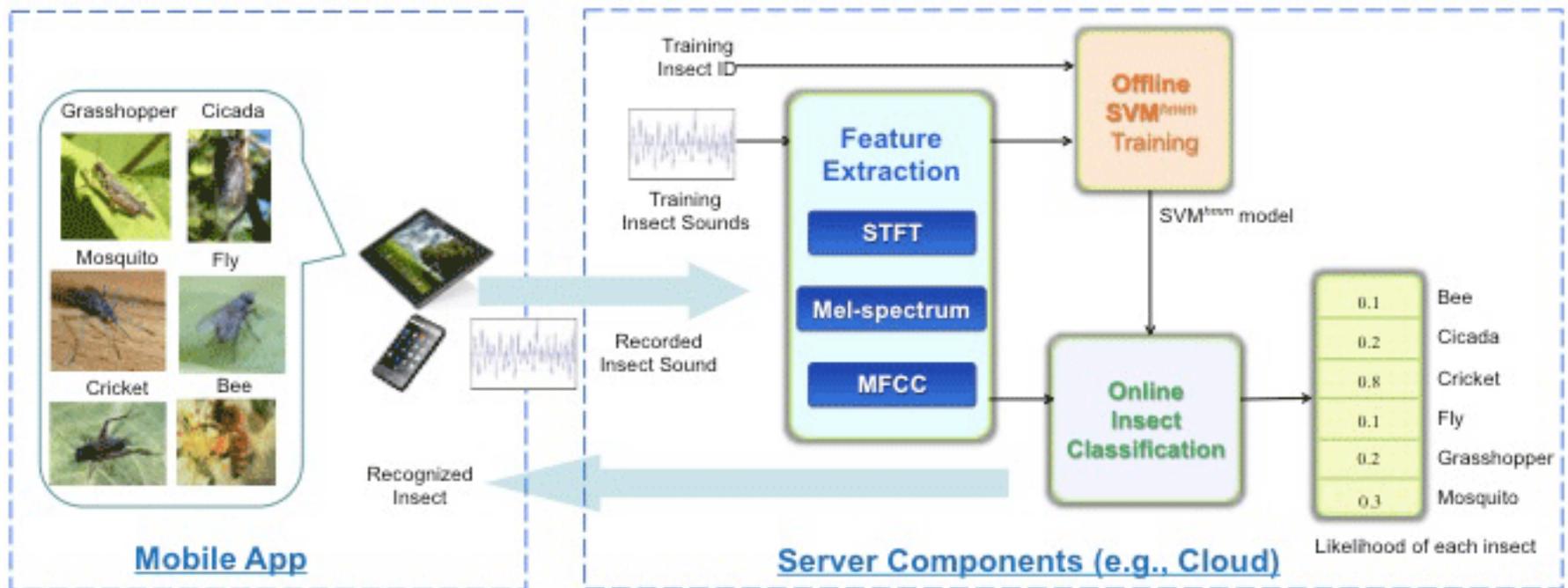


And the future is bright



Pests meet an Android App

System Framework:



<http://cosmiccentres.org/index.php/projects-of-cosmic/farmers-projects/item/25-pest-sound-classification>



Selected sound is Beehive2.wav
Sound is recognized as Bee. The result is CORRECT.



Ground Truth



Recognized Pest

- Browse Recorded Sound for classification of Pest
- Browse Unknown Insect Sound for classification of Pest

Recognize Sound

Play Pest Sound

Record Sound

Exit



But we, yet, needlessly suppress
opportunity in the Political Spectrum.

To get public parks, no need for a
Federal Land Commission.

land ownership → Central Park



Fragmented use rights → tragedy

The LightSquared Fiasco



“Tragedy of the Anti-commons”



We've seen the future, and it's Coasian.



RIM INTER@CTIVE: PAGER + EMAIL (1998)

Actually, much more.



Makes calls w/o you dialing.



Mobile m2m



Yeah, and these, too.



 Google play **700,000 Apps**



DOES YOUR PHONE COMPANY SUPPORT THE TEA PARTY—OR PROGRESSIVE CHANGE?

You may think your choice of mobile phone companies is a neutral one. But is your mobile provider supporting politicians **directly** opposed to your values?

Verizon Wireless and AT&T helped elect Tea Party-backed Senators Rand Paul, Marco Rubio and Mike Lee. And AT&T gave **\$386,000** to House Tea Party Caucus members in 2009-2010, while Verizon Wireless gave **\$35,500**.

Unlike Verizon Wireless or AT&T, **CREDO Mobile** pushes back hard against the Tea Party agenda—with our network of 2 million activists, and millions of dollars in donations to progressive nonprofits. **CREDO would never give a dime to Tea Party politicians.**

[Stand up for social justice—with your phone. Switch to CREDO Mobile, America's only progressive phone company.](#)

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- **10% off** your monthly service fee for **two years**
- **Contract buyout credit** up to \$200 per line, for up to three lines
- **No contract** for 30 days**
- **Number portability** (keep your current number)
- **Great coverage** through the nationwide Sprint® network, reaching over 280 million people.†
- **Free shipping**

With **CREDO Mobile** you'll also get one feature you won't find anywhere else: automatic donations to progressive causes. That's because we automatically donate a portion of your monthly charges to nonprofit groups. Since 1985 CREDO members have raised **over \$67 million** for groups like Democracy Now!, Earthjustice, Planned Parenthood and Doctors Without Borders.

So take a look at your last phone bill, and think about where your money is going. Then think about **CREDO Mobile**.

[Get 10% off your monthly service fee](#) for 24 months + contract buyout credit.* Call [877-346-0516](tel:877-346-0516) and mention special offer code **500749** or [join online](#). Offer expires **June 22, 2011**.

join now



FREE LG Optimus S™ Android™ smartphone



FREE LG Rumor2 messaging phone*

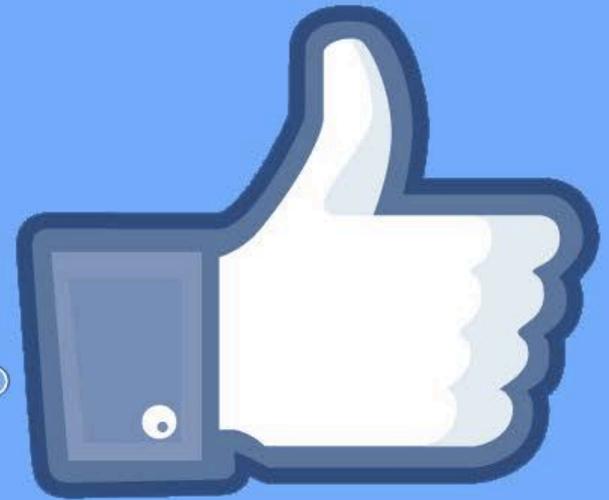


FREE Sanyo 3810 cameraphone*



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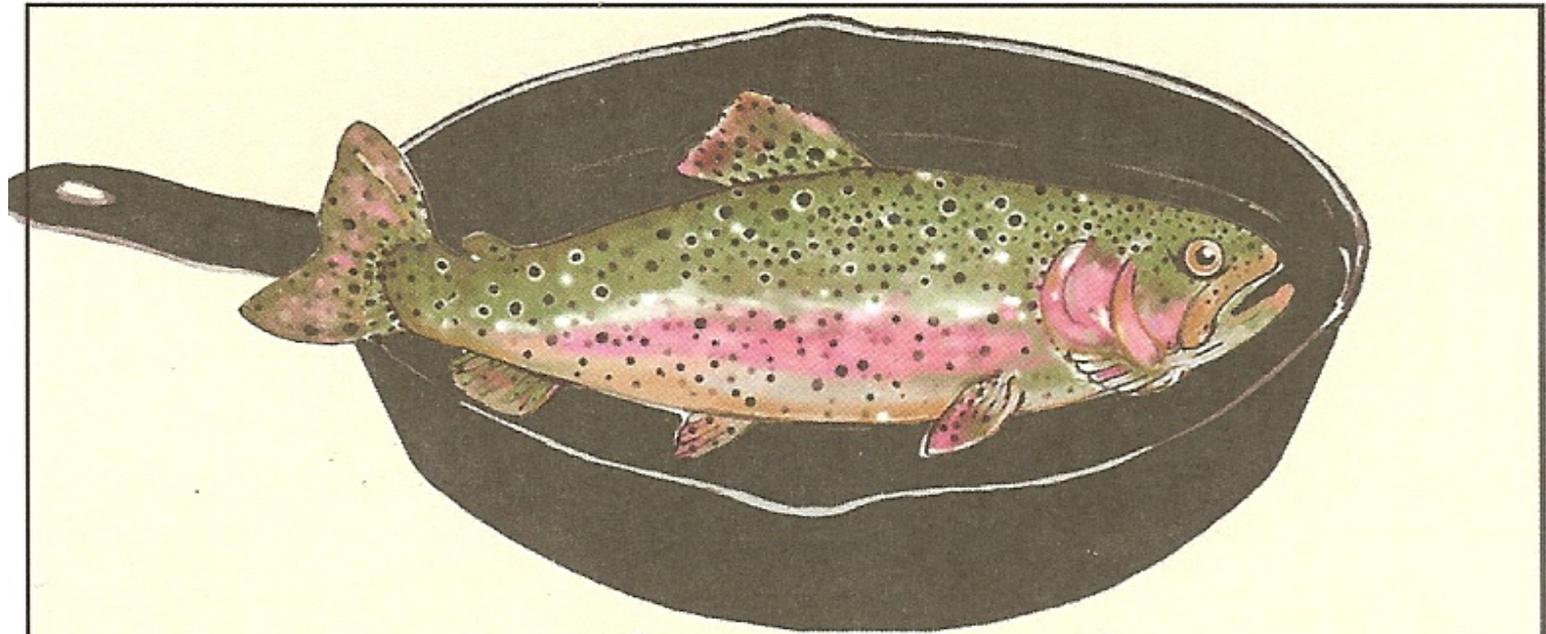


Haunted by paradigms past.

Mad Men for \$800

[Jeopardy! Game #6424](#) (July 19, 2012)





The End of the Rainbow

Thank you.