

SMPTE Technology Webcast Series
SMPTE – Enabling Global Education



Six Centuries of Opera and Media Technology in New York

NATIONAL OPERA WEEK 2018
October 26 – November 4 | OPERAAMERICA.ORG/OPERAWEK | #OPERAWEK

a free National Opera Week event from the SMPTE New York Section

SMPTE Technology Webcast Series Sponsored by:



Mark Schubin, NY Section, 2018 November 1

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Our Guest Speaker



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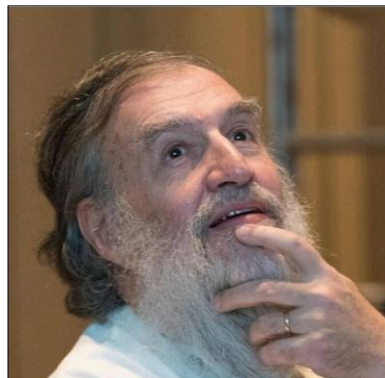
Mark Schubin

Multiple Emmy-award-winner

SMPTE Fellow

*Winner of the SMPTE 2017
Presidential Proclamation*

*45th anniversary as an
opera engineer*



Your Host

Joel E. Welch

*Director of Education
SMPTE*



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New York Section

SMPTE Technology Webcasts

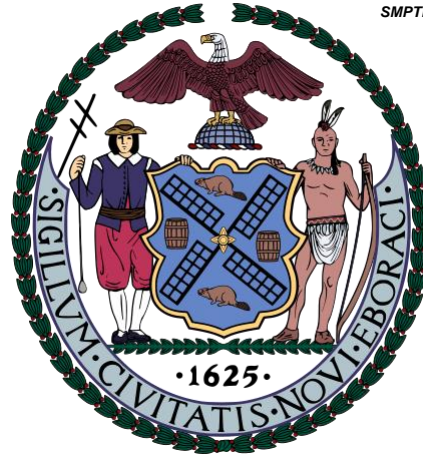


SMPTE - Enabling Global Education

- Series of monthly 60- to 90-minute online, interactive webcasts covering a variety of technical topics
- Free professional development benefit for SMPTE members
 - This one is free to everyone!
- Sessions are recorded for member viewing convenience.
 - On-demand video will be available for all to view

Actually,

- just 420 years,
- but still six centuries:
 - 16th century (1598)
 - 17th century
 - 18th century
 - 19th century
 - 20th century
 - 21st century (2018)



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Media City

- news
- recording
- publishing
- TV
- radio
- movies
- online

<https://www.statista.com/chart/3299/new-york-is-the-worlds-media-capital/>



statista The Statistics Portal
Statistics and Studies from more than 22,500 Sources

Prices & Access - Statistics - Reports - Expert Tools - Infographics - Services - Global Survey **NEW**

Media & Advertising > New York Is The World's Media Capital

New York Is The World's Media Capital

by Felix Richter, Mar 11, 2015

New York is the world's media capital. That's the result of a recent [PwC report titled "Cities of Opportunities"](#) which compares the size of the entertainment & media sector across 30 metropolises around the world. The report takes into account consumer spending on internet access, media and entertainment as well as on- and offline advertising spending.

With estimated entertainment & media spending of \$19.7 billion in 2014, New York dethroned Tokyo, which used to have the world's largest E&M sector until very recently. PwC predicts New York's E&M sector to grow at an average annual rate of 4.5% between 2013 and 2018, extending its lead on Tokyo which is expected to grow only marginally in the meantime.

Felix Richter
Data journalist
felix.richter@statista.com
+49 (40) 284 841 557



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Opera City

- ~120 active opera companies
- Tucker Square
 - opera tenor Richard Tucker
- Verdi Square (right)
 - opera composer Giuseppe Verdi
 - Ansonia (left) home to opera singers, conductors, composers, & long-time Metropolitan Opera general manager Giulio Gatti-Casazza (spoofed by the Marx Brothers and Disney)



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Trader Joe's supermarket



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1909: "Greatest Opera City"



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NEW YORK THE GREATEST OPERA CITY IN THE WORLD

TWO HUNDRED AND THIRTY PERFORMANCES A YEAR — BETTER CASTS
THAN ABROAD, AND AN EAGER PUBLIC — THE EARNINGS OF THE STARS

BY

W. J. HENDERSON

THERE is no public more greedy for the opera than the people of New York, which includes music-loving visitors from all over the United States. The more the impresarios offer, the more the public the large number of people who had, up to that time, been unable to secure desirable seats in the Metropolitan were perfectly willing to go somewhere else in search of operatic pleasures. Mr. Hammerstein developed

The World's Work: A History of Our Time, Volume 17
Doubleday, Page & Co., 1909

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2015: Snapshot of Opera in NYC



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at minimum:

- 908 performances of
- 265 productions of
- 211 operas by
- 115 composers
- 115 opera companies in
- 111 venues



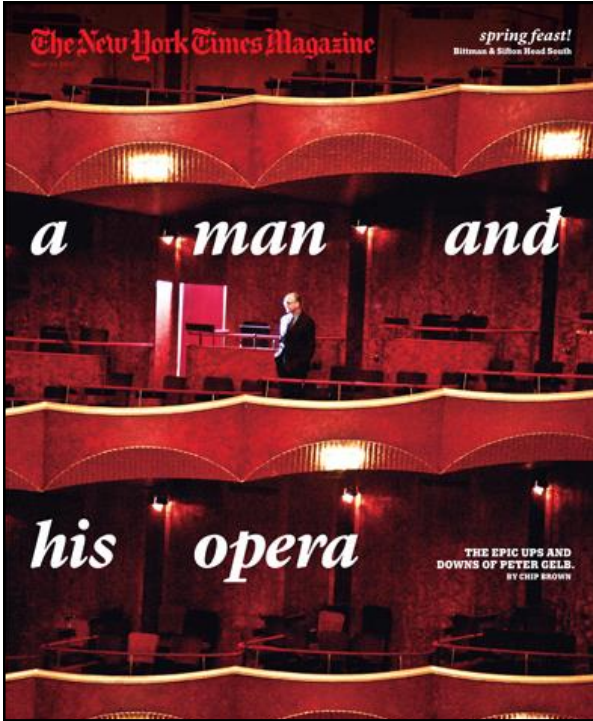
Metropolitan Opera House

- 10 colleges with opera programs

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“This, after all, is opera, opera in New York, not some dainty pastime like professional hockey....”

Chip Brown, cover story
The New York Times Magazine, March 24, 2013

Metropolitan Opera



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Opened 1883, new house 1966

- 3800-seats, >100'-deep stage
- 7 performances/week, different operas
 - two different operas on stage/day
 - 24-hour stage operations
- \$330 million annual budget*
- >3,400 people*, 15 unions
 - 156 orchestra musicians
 - 160 chorus members
 - 115 ballet dancers
 - 462 other artists



* *The New York Times Magazine*
Sunday, March 24, 2013

Why Opera & Media Technology



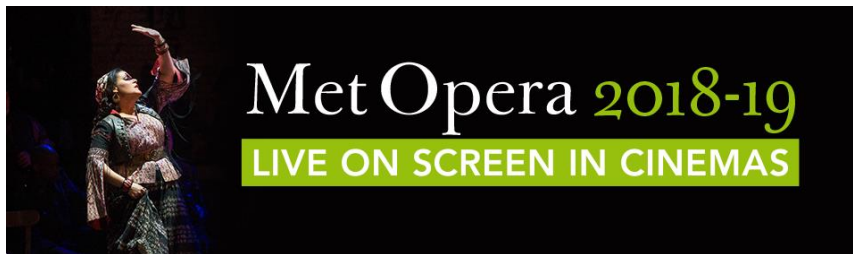
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opera offers

- content, stars, stories
- startup/prototype funding

media technology offers

- bigger audiences
- amortized or reduced staging costs



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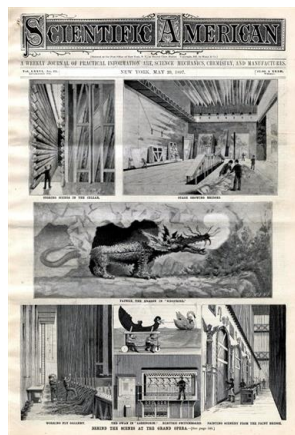
Metropolitan Opera House



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Old: opened 1883

- capacity ~3850
- *Scientific American* cover 3x
- unobtrusive recording 1901
- assisted listening 1903
- sound distribution 1908
- radio broadcasts 1910
- TV 1948; live cinema 1952



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Metropolitan Opera House

New: opened 1966

- capacity >4000
- interactive projection
- intercity stereo network 1973
- cabled for TV when built
- HDTV 1990, to cinemas 2006
 - multi-language subtitles 2008
- Technology Emmy & IBC IHE awards 2009



interactive projection controlled by microphones, IR cameras, & rotational encoders, with image warping & depth-plane selection

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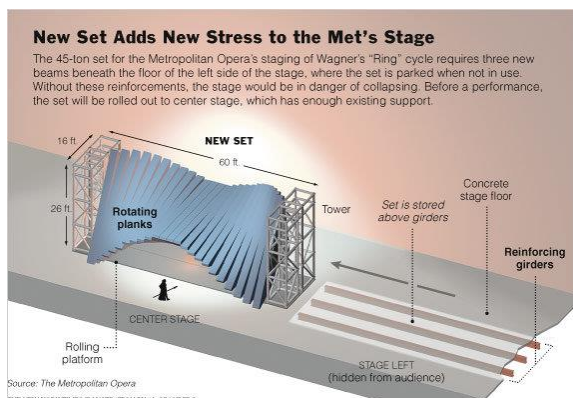
Metropolitan Opera House



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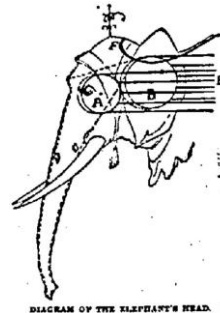
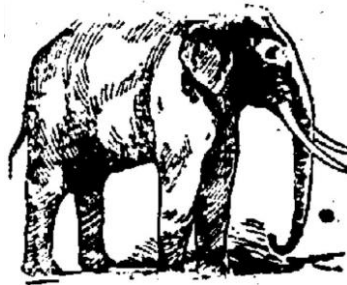
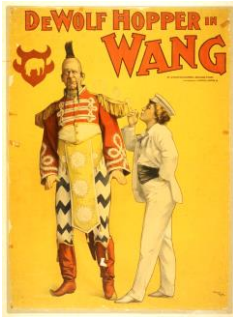
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Not Just the Met



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- latecomer video & conductor monitors at NYCO 1964
- HD image magnification introduced at NYCO 1991
- DeWolf Hopper Opera Company 1891 mechanical elephant



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On Site Opera 2014



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Eric Einhorn wearing Google Glass during their production of Rameau's *Pigmalion* at a mannequin showroom

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Some NYC Opera-Specific Venues



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- *Secret Gardener* in a hidden garden
- *Blue Monday* at the Cotton Club
- *Silly Baby Mouse* at the Bronx Zoo
- *Frankenstein* in cemetery catacombs
- *Eliogabalo* at a burlesque house
- *Ludus Danielis* at a medieval chapel
- Haydn's *The World of the Moon* at the Hayden Planetarium



October 2018 - <https://milelongopera.com/>

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portion of photo by
Richard Termine of
Gotham Chamber
Opera's production of
Il mondo della luna
at the Hayden Planetarium

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House of the Redeemer



library of Francesco
Maria II della Rovere,
last Duke of Urbino,
created by Nicolo
Sabbattini, 1607-9

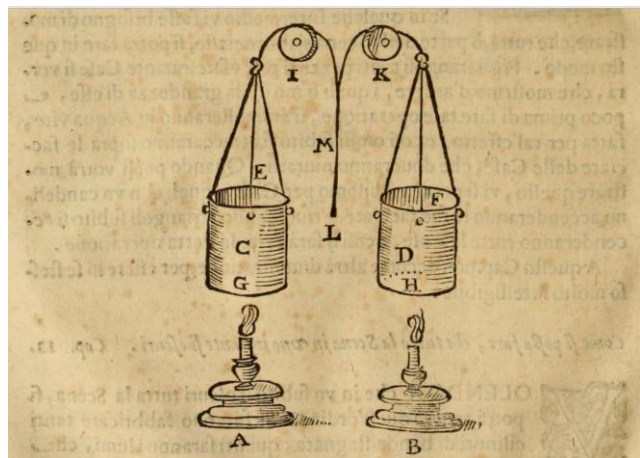
photo courtesy of
Manhattan Sideways
<http://sideways.nyc/>

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17th-Century Lighting Dimmer



Source gallica.bnf.fr / National Library of France

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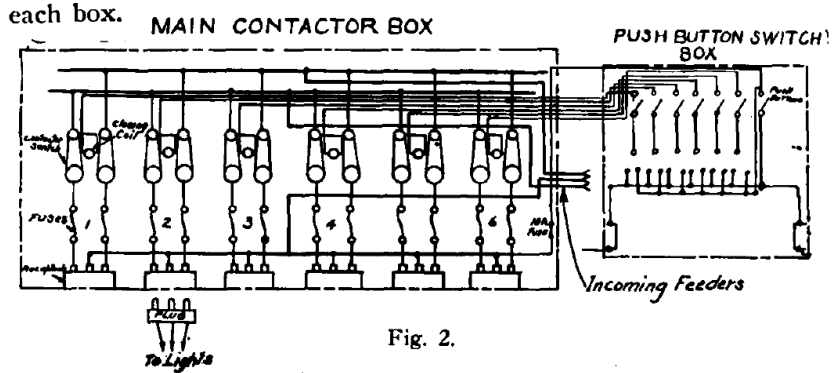
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20th-Century Lighting Grid



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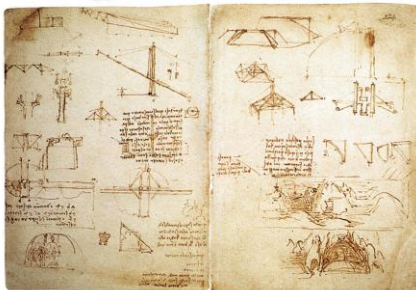
Amsterdam Opera House (NYC) remote-control installation
Transactions of the SMPE, May 1920

The First Opera?



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- Galileo's father: ancient Greece
- *Ludus Danielis* 13th century
- Poliziano's *Fabula di Orfeo* c.1480
 - Leonardo da Vinci designed stage machinery



from the
*Codex
Arundel*
c. 1506

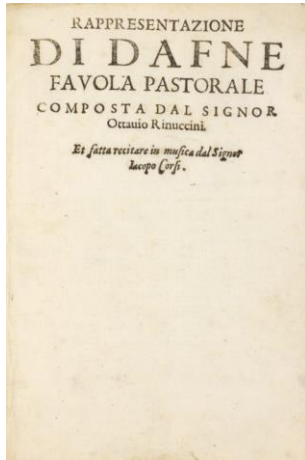
Vincenzo
Galilei's
opera book
1581



1598 (common year numbering)



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libretto:
literally, little book;
in opera, the words

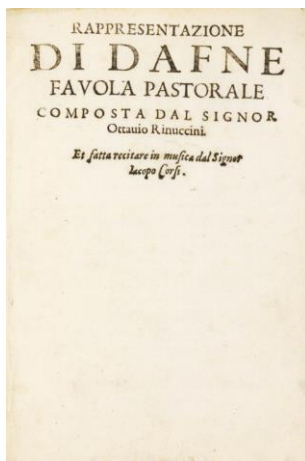
according to at
least one scholar
the original 16th-
century libretto

New York
Public Library's
Library of the
Performing Arts

Commercial Expediency

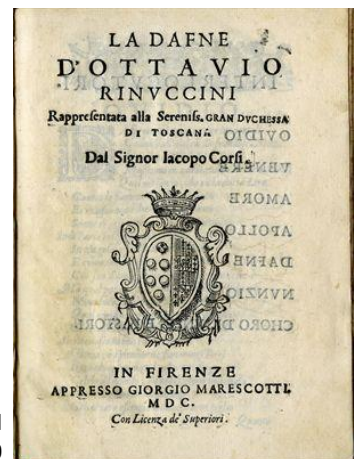


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according to at
least one scholar
the original 16th-
century libretto

New York
Public Library's
Library of the
Performing Arts



commercial
edition 1600

18th-Century Opera in New York

- 1703: Anthony Aston arrives
- 1747: *Punch's Opera: Bateman, or the Unhappy Marriage* at Whitehall slip
- 1750: opera performances at the Nassau Street Theatre
 - foot stoves allowed
- 1767: 1st published American libretto, *The Disappointment*
- 1794: 1st American opera with libretto by a woman, *Tammany, or the Indian Chief*

The LIFE of TONY ASTON. 21
through *Elizabeth-Town*, and so in the Packet to *New York*.—There I lighted of my old Acquaintance *Jack Charlton*, Fencing-Malter,—and Counsellor *Reignieur*, sometime of *Lincoln-Inn*, sup-
ply'd me with Buſineſs—'till I had the honour of being acquainted with that brave, honeſt, un-
fortunate Gentleman, Capt. *Henry Pullein*, whoſe Ship (the *Fame*) was burnt in the *Bermudas*; he (to the beſt of his Ability) affited me — ſo that after acting, writing, courting, fighting that Win-
ter—My kind Captain *Davis*, in his Sloop built at *Rhode*, gave me free Paſſage for *Virginia*, where the noble Governor *Nicholſon* treated me hand-
ſomely till the Fleet under Commodore *Evans* in the *Dreadnought*, with *Oxford*, *Falkland*, *Foy*, &c. convoy'd above 500 Sail out of the Capes,



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THE FOOL'S OPERA; OR, THE TASTE of the AGE.

Written by MAT. MEDLEY.
And Performed by
His COMPANY in *Oxford*.

*Hunkinbuz Pollicekemin Bamboosless
Geyrichem alwong.*

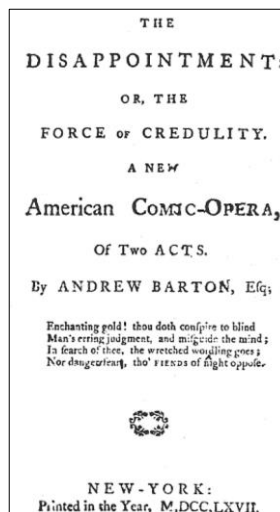
To which is prefix'd,

A
S K E T C H
OF THE
AUTHOR'S LIFE,
Written by Himself.

LONDON:
Printed for T. PAYNE at the *Crown* in *Paternoſter-Row*; and ſold by A. DODD, at the *Peacock* without *Temple-Bar*, and E. NUTT at the *Royal Exchange*.

18th-Century Opera in New York

- 1703: Anthony Aston arrives
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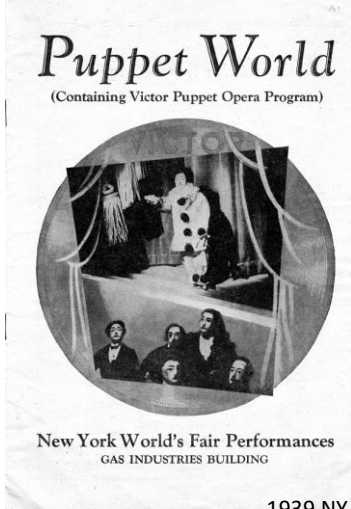
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More on Opera Puppets in NY



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Aida (Long in Italian)
Opera in Four Acts by Giuseppe Verdi
CHARACTERS (in order of their appearance)
Rameses, High Priest of Amon, King of Egypt
Aida, Princess of Ethiopia, Aida's sister
Amnion, daughter of the high priest
Iphigene, daughter of the high priest
The same men appear to enter during the act of the Operetta.

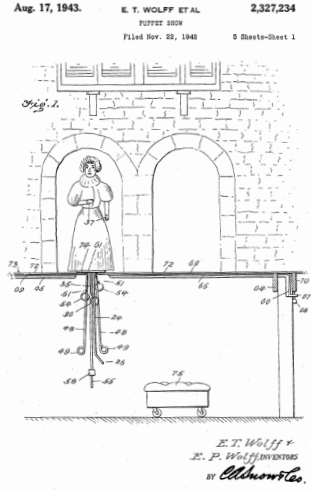
ACT I. A hall in the palace.
In the beautiful city "Thebes Aida," Rameses expresses his love for Aida, the Ethiopian Princess, and a captive slave to the Emperor Amnion of Egypt. Amnion, recognizing Aida as the sister of his enemy, Aida's father, is separated with jealousy. Aida was to be delivered to Amnion, but she was rescued by Rameses. Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida. Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida. Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida.

ACT II. Within the city walls.
To the stirring "March of the Soldiers," Rameses, victorious, returns to the city, preceded by a procession of soldiers, drums, cymbals, and cymbals. The entrance is brought to a halt when he is arrested by Amnion, the Ethiopian King, disguised as a common soldier. Through the intervention of Iphigene, the princess of the city, Amnion is released as a hostage. As a reward for his services to his country, the King orders Rameses to be freed to accept again his wife.

ACT III. At the banks of the Nile.
As the evening stars on the lengthening Nile, Amnion and the High Priest are overjoyed to share in a long and happy reunion with their daughter, Aida. Aida comes from the scene and sings the tender, separating song, "I Fearful Night of the Separation." Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida. Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida.

ACT IV. The Temple of Vulcan and the walls of Thebes.
Amnion, through the walls of the city, where he has been condemned to die. As the stars gleam brightly on the walls, Rameses, disguised as a common soldier, enters the temple. Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida. Aida is separated from her father, Amnion, and Rameses is separated from her lover, Aida.

THE NEW YORK WORLD'S FAIR, 1939, OPERETTA, MUSIC BY VERDI, LYRICS BY VERDI, COSTUME DESIGNER, NEW YORK, N.Y.



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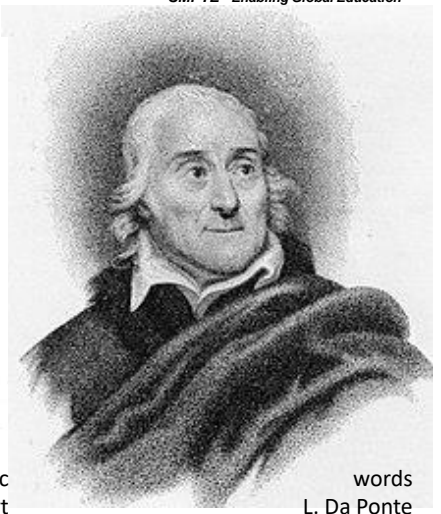
One Degree of Separation



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some of Mozart's most-famous operas:

- *Le nozze di Figaro*
(*The Marriage of Figaro*)
- *Don Giovanni*
- *Così fan tutte*



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Lorenzo Da Ponte in New York

- bookstore
- Clement Clark Moore and Julia Ward Howe friends
- 1st Columbia Italian professor
- 1825: brings Italian opera
- 1833: at age 84, creates 1st dedicated opera house in U.S. at Church & Leonard Streets



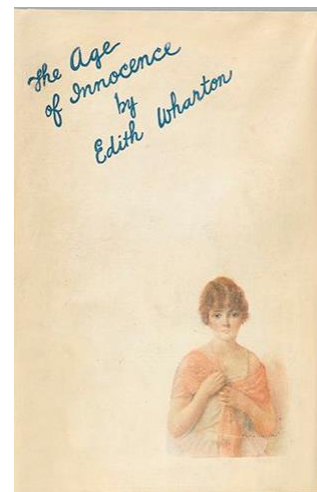
Language



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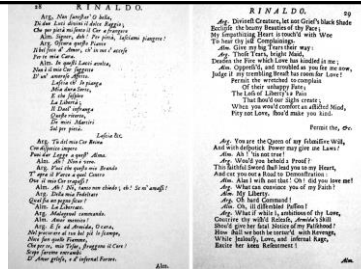
“An unalterable and unquestioned law of the musical world required that the German text of French operas sung by Swedish artists should be translated into Italian for the clearer understanding of English-speaking audiences.”

1920, Edith Wharton
The Age of Innocence, chapter 1

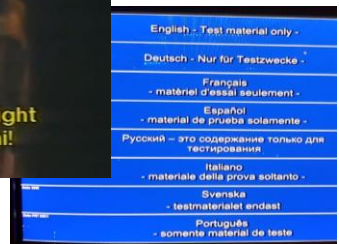
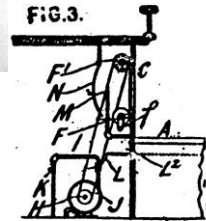


Language

- 1711: dual-language libretto
- 1881: British patent 4267, gas-jet illumination
- 1976: *Live from Lincoln Center*
- 1983: NYCO (1st house in U.S.)
- 1995: Met Titles, per seat
 - narrow optical filtering
- 2007: Met live multi-language



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Invention of the Showboat

- 1816: Noah Ludlow of Albany, launches *Noah's Ark* in Olean, NY
- 1831: Chapman theatrical family of NYC, 1st dedicated showboat
- 1842: *Bombastes Furioso* on the opera barge
- 1845: *Temple of the Muses* (formerly *Virginia*) by the Chapmans
 - 2000 capacity
 - orchestra pit
 - Drummond light (gas made on board)
- 2018: *Anna Christie* world premiere
 - takes place on a barge
 - libretto by Joseph Masteroff



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Four Puccini Operas

- *La fanciulla del West*
- *Il trittico*
 - *Il tabarro*
 - another barge opera
 - *Suor Angelica*
 - *Gianni Schicchi*



Giacomo Puccini
composer of
La bohème

Baseball



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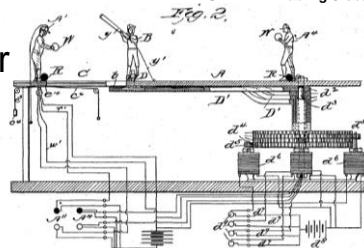
- 1895: Frank Chapman opera-house tour

WILL GIVE OPERA
IN BASEBALL PARK

Owners of Polo Grounds Have
Contracted for Performances

The New York Times
4/2/1923

US patent
546,003



- 1923: Polo Grounds (later Ebbets Field, Yankee Stadium)

“PRINCE METHUSALEM’S” BASEBALL. *The New York Times*, 8/15/1888

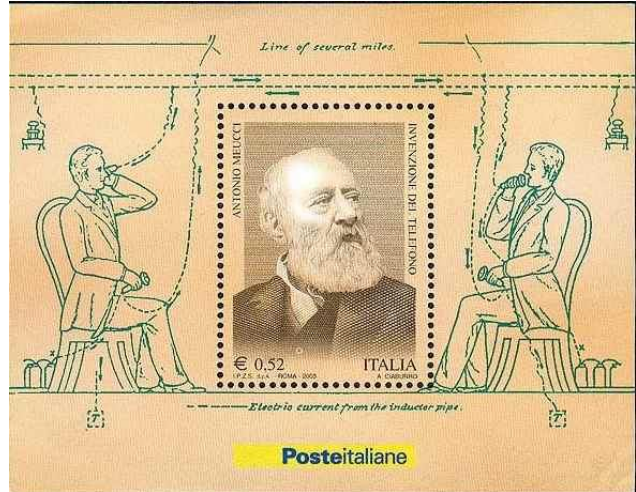
- 1888: “Casey at the Bat” introduced in an opera in New York
 - later “Take Me Out to the Ball Game” at a Brooklyn opera house

Antonio Meucci



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- head of special effects at Florence opera house
- technical director at Havana opera house
 - began working on the telephone in 1849
- moved to Staten Island in 1850
- home now Garibaldi-Meucci Museum



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Telephone



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- 1876: prediction
- 1880: Edward P. Fry
 - electronic home entertainment
 - led to stereo 1881
 - led to pay-cable 1885
 - most likely 1st headphones
 - (as impresario of the Astor Opera House, saved William Macready's life during the deadly *Macbeth* riot of 1849)

No man who can sit in his own study with his telephone by his side, and thus listen to the performance of an opera at the Academy, will care to go to Fourteenth street and to spend the evening in a hot and crowded building.

"The Telephone"
The New York Times
March 22, 1876



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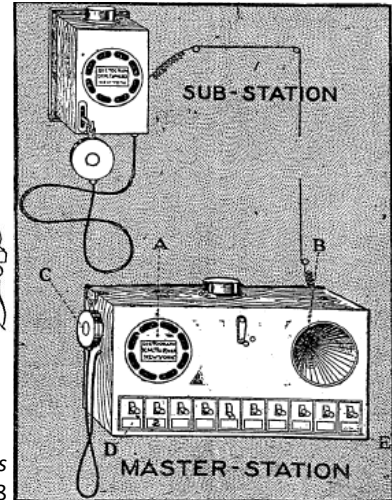
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Electrical Sound Installations



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- 1903: Acousticon hearing-aid demo at Metropolitan Opera
 - 25 seats wired for sound
- 1908: sound surveillance system installed from stage to general manager's office and other locations



The New York Times
January 19, 1908

Television

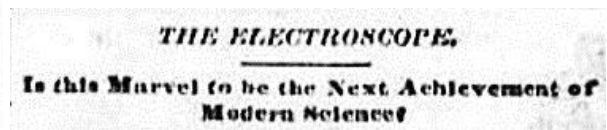


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word not coined until 1900, but 1877 had the earliest publication



(March 30, 1877)



Both telephone and electroscope applied on a large scale would render it possible to represent at one time on a hundred stages in various parts of the world the opera or play sung or acted in any given theatre.

More Opera TV in NY

- 1939: *Carmen* on W2XBS
- 1940: Met studio production
- 1948: TV from the Met
 - IR lighting, dry ice on cameras
- 1949-64: *NBC Opera Theater*
- 1953: 1st NTSC color at home
- 1963: unstageable *Labyrinth*
- 1971: low-light, cable-TV (beat CBS & NBC)



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Shooting Live Opera Onstage

1973: my 1st, Metropolitan Opera
Les contes d'Hoffmann

- focal distance as much as 175'
- very low light level
 - USAF SEC tubes, image intensifiers, bias light
- very high contrast
 - Thomas Stockham (E.G.O.)
 - 1975 HDR>SDR conversion
 - 1976 digital audio recording

these
images
shot on
film by
George
Honchar



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Amahl and the Night Visitors



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- 1951: 1st opera commissioned for TV (*NBC Opera Theater*)
 - aired 17 consecutive years +
 - aired worldwide & staged
 - led to more opera commissions
 - ABC 3, CBS 14, NBC 13
- conductor monitors
 - singers in one studio; orchestra in another
 - no need to turn
 - adopted in houses



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Older Is Better?



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LCD

- thin
- lightweight
- low power
- low cost



CRT

- deep
- heavy
- high power
- hard to find

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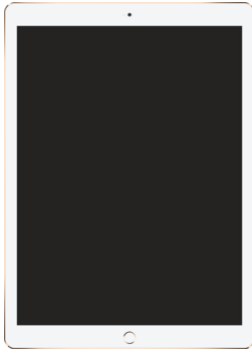
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Older Is Better!



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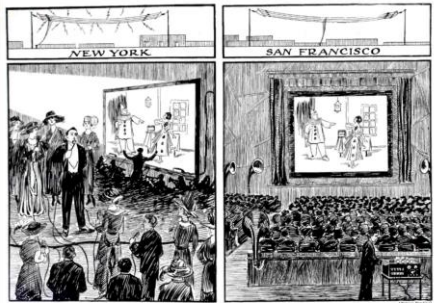
- LCD
- thin
 - lightweight
 - low power
 - low cost
 - **latency**



- CRT
- deep
 - heavy
 - high power
 - hard to find
 - **no latency**

Live Cinema

- 1877: publication
- 1919: semi-live proposal
 - film with radio sound
- 1952: 27 U.S. cities
- 2006: *The Met: Live in HD*
 - projectionists, not engineers



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Amateur Radio News
September 1919



clap stick
for sync
testing



Metropolitan
Opera Archives

The Metropolitan Opera

HD LIVE

1878: Recording, per Edison

“The apparatus now being perfected in mechanical details will be the standard phonograph, and may be used for all purposes, except such as require special form of matrix, such as toys, clocks, etc. **The main utility of the phonograph, however, being for the purpose of letter-writing and other forms of dictation, the design is made with a view to its utility for that purpose.**”

“The Phonograph and Its Future,” *The North American Review*, 1878

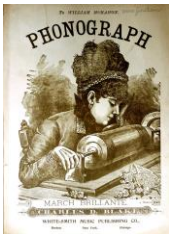


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Then Opera

soprano Marie Rôze recording an aria from the opera *Faust* in New York City becomes the image of the phonograph



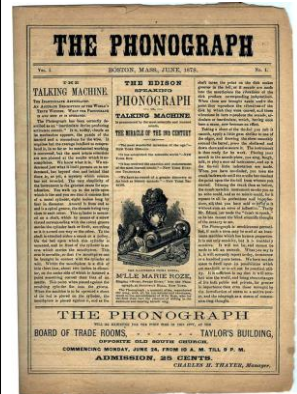
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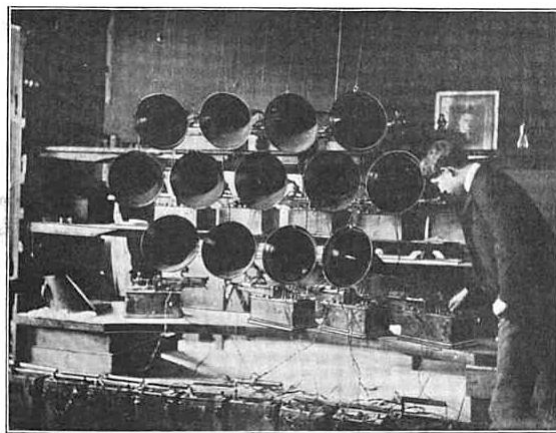


Cylinders Hard to Replicate

so accidental stereo (whenever someone finds the cylinders and synchronizes them)



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THIRTEEN PHONOGRAPHS "SET" TO CATCH FULL ORCHESTRA OF TWENTY-SIX PIECES

Talking Machine News, September 1903

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Cylinders Hard to Replicate

so stamped disks
across the river at
the Regina Company
in Jersey City (later
vacuum cleaners)

(recorded disks
coming in a moment)



1888: 1st Bootleg Recording

- Casino opera house
 - 1st in NYC with electric lights
 - 1st with air conditioning (of sorts)



“electric
fanning
machine”

Interesting and highly colored accounts of queer incidents seem to be “the rage” just now around the theatres which employ special men to do their press work. The latest comes from the Casino. The story is to the effect that on Wednesday evening the manager of a small travelling opera company went to see “The Yeomen of the Guard,” and took with him a phonograph. He had succeeded in recording the entire first act with his machine, when the eagle eye of an usher lighted upon him and he was hustled, phonograph and all, into Mr. Aronson’s office. The manager explained that he wanted to produce the operetta on the road, and had been compelled to steal the score, as he could not get it otherwise. The libretto he had bought for twenty-five cents. Mr. Aronson was generous and forgave the manager, but took the imprinted foil of the phonograph away from him.

*New-York
Daily Tribune
Nov. 2, 1888*



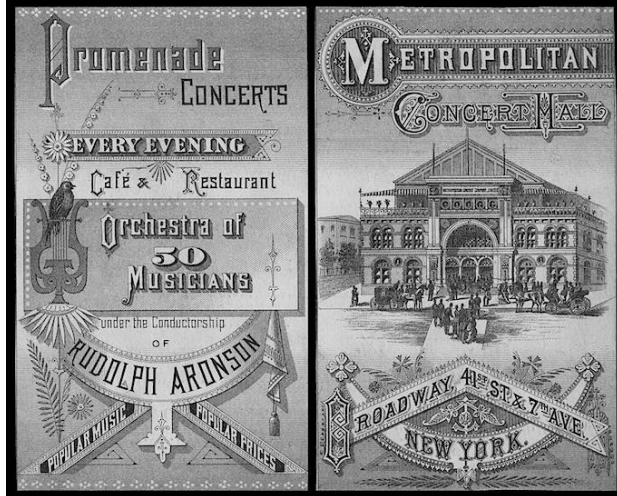
1880: Retractable Roof



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same manager's
previous theater

heat of gas lighting
escaped through open
roof; strollers could
listen while walking
around the hole



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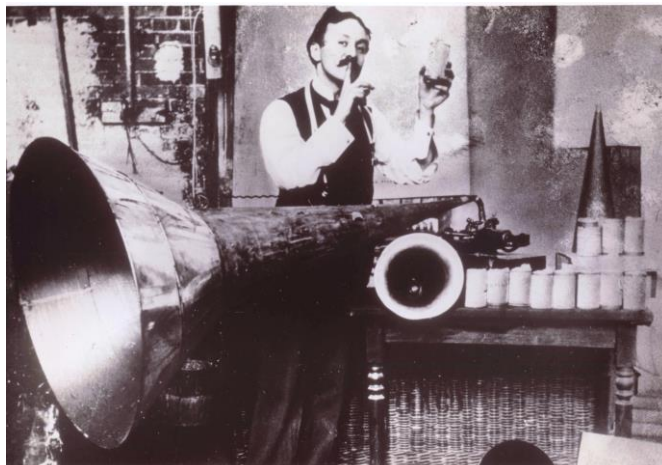
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1901: Location Recording



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Metropolitan Opera librarian Lionel Mapleson

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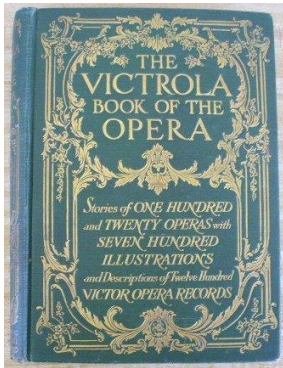
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Victor Bets on Opera



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- 1888: Berliner disk gramophone
- 1901: Victor company founded



world's largest illuminated sign
courtesy of
Artkraft Strauss



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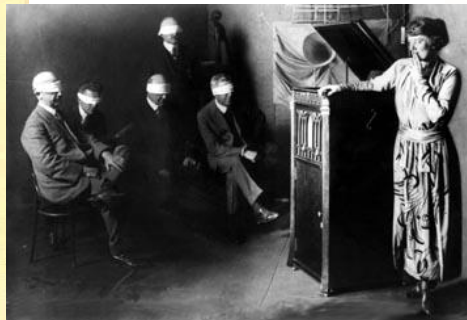
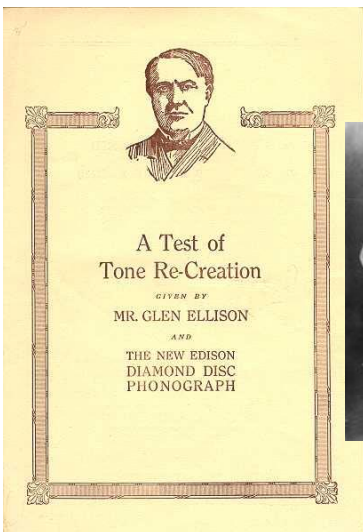
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Edison Converts to Disk



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--and no one could tell the difference



Anna Case confessed in 1972



Last night's audience mystified

Tries vainly to detect the difference between art of famous songsters and RE-CREATION by Edison's new phonograph

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Blind Deconvolution

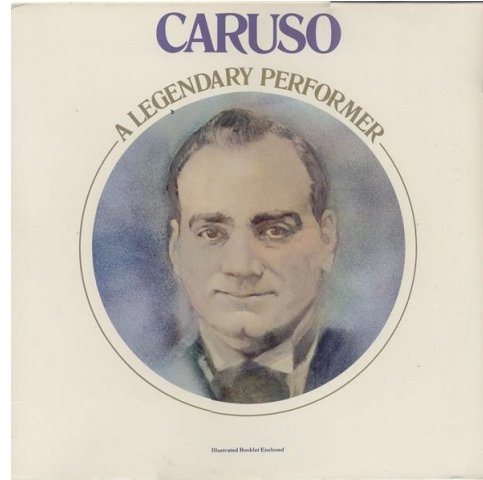


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Thomas Stockham signal processing



sketch by Enrico Caruso
earliest-recorded million seller
"Vesti la giubba," recorded in NYC



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Solution to the No-Image Problem



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records synchronized
with photographs



The Automatic Wonder of the Age
ROSENFELD'S
Illustrated Song
MACHINE

AN AUTOMATIC THEATRE
YOU SEE AND HEAR THE WHOLE SHOW
Four Machines in One

ILLUSTRATED SONGS MACHINE
ILLUSTRATED LECTURES MACHINE
EDUCATIONAL REFORMATION MACHINE
EDUCATIONAL EXHIBITION MACHINE

NO STORAGE BATTERY NECESSARY
Operated by simply connecting it to any Electric Lighting Circuit

The machine is entirely automatic in action and is started by simply dropping the coin in slot. There are no levers or handles to pull or push.

ILLUSTRATED SONGS
The picture being illuminated by powerful magnifying lenses gives an effect of one beautiful and realistic, and then the picture (two days before the operators' eyes in perfect union with the talking machine) the picture being displayed automatically to correspond with the words and music of the Talking Machine, thus insuring the public for the first time - automatic machine - one of the most fascinating forms of amusement - one that will never lose its interest or novelty, as illustrated songs are really more popular now than when first introduced nearly a quarter of a century ago.

ILLUSTRATED LECTURES
By simply changing the picture holding drum and the lens, the machine can in a few minutes be arranged to show the regular course of interesting **electrotype pictures**, of which thousands are published, and by placing a white card in the mouth and using a recorder, records

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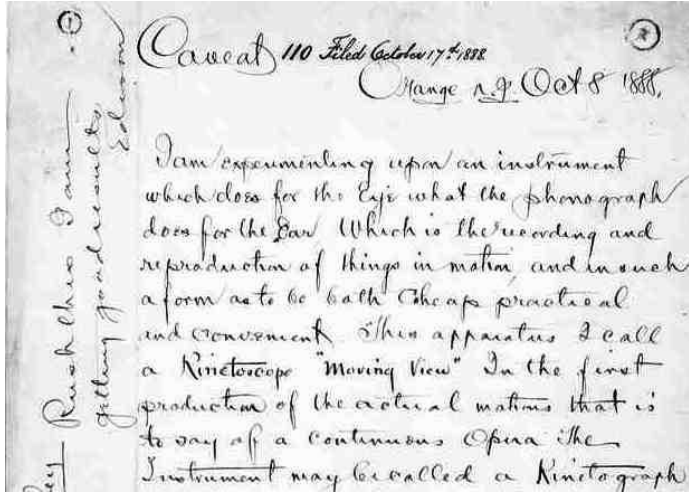
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1888: Edison Movie Patent Caveat



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sole
purpose:
opera



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1894-5: Sync-Sound Movie



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- opera-music-based

Dickson
Experimental
Sound Movie
cylinder restored
at NYPL then
synchronized by
Walter Murch
in 2000



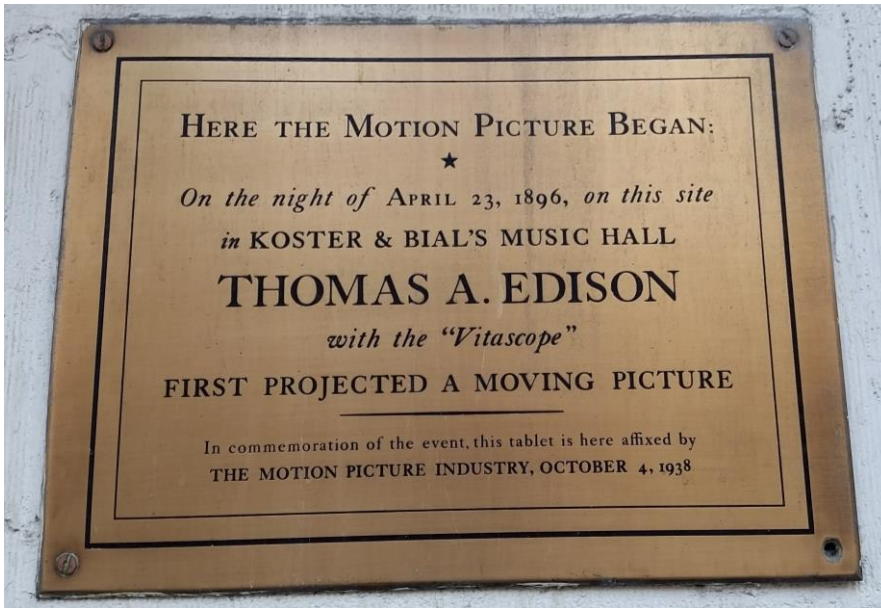
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originally the first Manhattan Opera House, created by Oscar Hammerstein (now part of Macy's)

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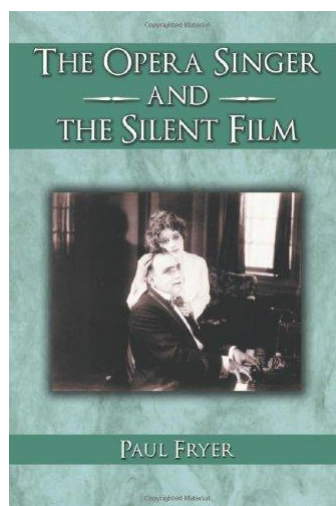
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Why Opera for Silent Movies?



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- titles
- stories
- local sound
- stars



opera star Geraldine Farrar as Carmen in 1915 directed by Cecil B. DeMille

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1899: Sound-Picture Movie Marriage

The Opera of Martha projected at the Eden Musee with singers behind the screen lip-synching to the images

meanwhile opera houses show movies

**"A PERFECT PICTURE MACHINE."
INSTANT AND EMPHATIC SUCCESS OF THE
AMERICAN VITAGRAPH.**
Opened May 2, at Central Opera House, N. Y.; re-engaged after first week for a long run. ORIGINAL, EX-
CLUSIVE WAR FILMS. STEADIEST PICTURE. NO VIBRATION. EXPERT OPERATORS. Machines built
on entirely new principles. Managers, write. AMERICAN VITAGRAPH CO., 30 Morse Bldg., N. Y. City.

New-York Clipper, May 21, 1898

Central Opera House (now the Fox Television Center)



2nd Manhattan Opera House

site of 1st Vitaphone feature sound recording

1926



now Manhattan
Center Studios



1907: Radio

- Eugenia Farrar
 - ashes in a phono-cylinder urn
- the telharmonium
 - 200-ton music synthesizer
 - 1st played opera music 1906
 - praised by Mark Twain
 - intended to deliver music to restaurants via phone lines
 - sent music to the Casino lobby
 - Lee de Forest transmits wirelessly



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The Telharmonium Problem

- each wave required its own alternator
- combined power induced music across ordinary phone lines
- wireless transmission interfered with Brooklyn Navy Yard communications
- but got the Navy interested in radiotelephones for the Great White Fleet (departed December 1907)



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a telharmonium rotor

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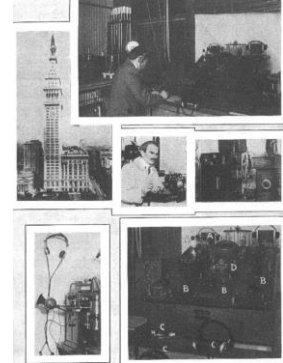
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1910: 1st Opera Broadcast

- on test day, wireless stations stay quiet
- on press day, with superstars Enrico Caruso and Emmy Destinn:
 - “deliberate and studied interference from the operator of the Manhattan Beach station of the United Wireless Company” *Telephony*, 3/5/1910
 - “the reporters could hear only a ticking which the operator finally translated as follows, the person quoted being the interrupting operator: ‘I took a beer just now, and now I take my seat.’” *The New York Times*, January 14, 1910



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WIRELESS MELODY JARRED.

An Interrupting Somebody Made of It
a Ticking Refrain Telling of Beer.

Military Opera Radio

- 1912: “Anvil Chorus” for testing
- 1919: music from New Brunswick Opera House heard 2000 miles away on *USS George Washington*



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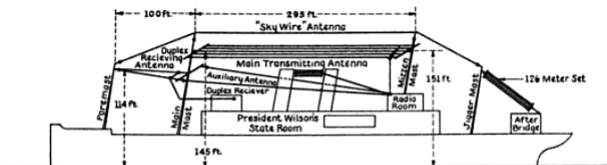


Fig. 4. Arrangement of the Separate Receiving and Transmitting Antennae on the U.S.S. *George Washington*

General Electric Review, October 1920

record. The one playing happened to be, “The Anvil Chorus,” from the opera, “Il Trovatore.” This selection was played by a band with a number of persons whistling, and proved to be a very effective record for fluctuating the ammeters, which was a desired feature. After an hour had passed with the continual playing of the same record, we shut down the generator and arcs, while the operator listened in to hear whether Fort Wood would call us. Upon calling Fort Wood, he received no reply from that station, but Manhattan Beach (DF) immediately called, and upon being told to go ahead, telegraphed: “For — sake change the tune.” When

Electrician and Mechanic, April 1912



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More Opera Radio in New York

- 1925: WEAJ establishes opera company
 - 1st network opera transmission
- 1927: 1st CBS broadcast includes full opera
- 1928: opera on radio precedes stage
- 1932: NBC commissions an opera
- 1937: CBS commissions “non-visual” opera
- 1938: 1st edited broadcast; puppet radio
- 1973: 1st live stereo-sound network
- 2006: 24-hour satellite opera channel



Milton Cross broadcasting from a box anteroom at the Metropolitan Opera

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1975: Voice-Synthesis Opera



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Opera: Computer Love

By DONAL HENAHAN

One of the durable myths of modern times is the mechanical monster that turns into a human (not to be confused with the familiar reality of a human turning into a monster). From Dr. Frankenstein's creation down to the computer Hal in “2001: A Space Odyssey” the idea has demonstrated its staying power as one of man's long-range worries and sources for comedy.

Joseph Olive's “Mar-ri-ia-a,” a miniature opera for soprano, computer and chamber ensemble that had its premiere performance on Monday night at Carnegie Recital Hall, showed once again that a lot of fun can be wrung from the rise of mechanical man to humanoid status.

The New York Times, April 9, 1975



composer and voice-synthesis researcher Joseph Olive at Bell Labs
courtesy of Nokia Bell Labs Archive

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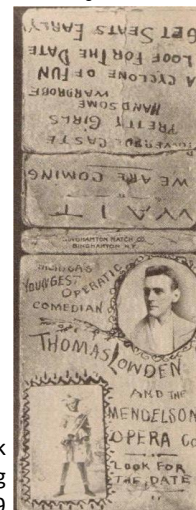
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Recap: Opera & Media Tech in NY



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advanced puppetry, alternative content for cinema, assisted listening, augmented reality, blind deconvolution, broadcasting, color TV, digital audio recording, electronic home entertainment, HDR-to-SDR conversion, headphones, interactive projection with real-time warping and depth-plane selection, intercoms, lighting grid, music & voice synthesis, remote baseball viewing, retractable roof, the showboat, stereo sound, subtitling, sync sound, the telephone, unobtrusive location recording



matchbook
advertising
said to be 1889

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Today Is **OPERA** **ADVOCACY DAY**



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- Spread the word on opera's role in technological development
- Consider donating to an opera company
- Try an opera; it can be fun (and/or moving)
- Consider contacting your government representatives
 - U.S. Capitol switchboard: 1 202 224-3121
 - some opera-related issues:
 - visas for international performing artists
 - charitable-contribution tax deduction
 - funding for the National Endowment for the Arts

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Questions in a Moment



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- these slides are available at bit.ly/6comtny
- this slide show, with audio, will be made available
- for opera & media technology not restricted to NY:
 - fully referenced, peer-reviewed paper: bit.ly/operastem
 - 48-minute slide show with audio: bit.ly/operamt
 - both free with no ads



1637 plan for
ducting opera
outside the
opera house

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Questions?



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Mark Schubin

Multiple Emmy-award-winner

SMPTE Fellow

*Winner of the SMPTE 2017
Presidential Proclamation*

*45th anniversary as an
opera engineer*



Joel E. Welch



- Slides are available at bit.ly/6comtny
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