

# **The History of Silicon Valley**

**From Fruit to Facebook.**

**Bret Waters**  
**bretw@stanford.edu**



# **Silicon Valley, California**

**Global hub of entrepreneurship and innovation.  
Headquarters of more than 2,000 tech companies.**

**The GDP of the Bay Area is more than \$500 billion, larger than  
most countries in the world.**





# Silicon Valley, California



# Santa Clara Valley



*Blossom Scene in the Santa Clara Valley of California*

You are most cordially urged to visit "The Valley of Heart's Delight"

For detailed information, contact the San Jose Chamber of Commerce



# Santa Clara Valley









**Chapter 1:**  
**The Entrepreneurs of 1849.**





# CALIFORNIA GOLD RUSH 1849



USA  
33

1999



# San Francisco, 1849

The population of San Francisco increased from 1,000 to 25,000 in less than two years.





# CALIFORNIA GOLD RUSH 1849



USA  
33

1999





**The “49ers” were known as hard-working, resourceful entrepreneurs.**

**They traveled thousands of miles to get to California, where they mined for gold, built stores, launched businesses, and created jobs.**





**Leland Stanford**

**A famous 49er.**





# Leland Stanford

**Grew up in New York, went to law school.**

**Lost everything in a fire.**

**Decided to join the California Gold Rush.**

**1852, owned a general store for miners.**

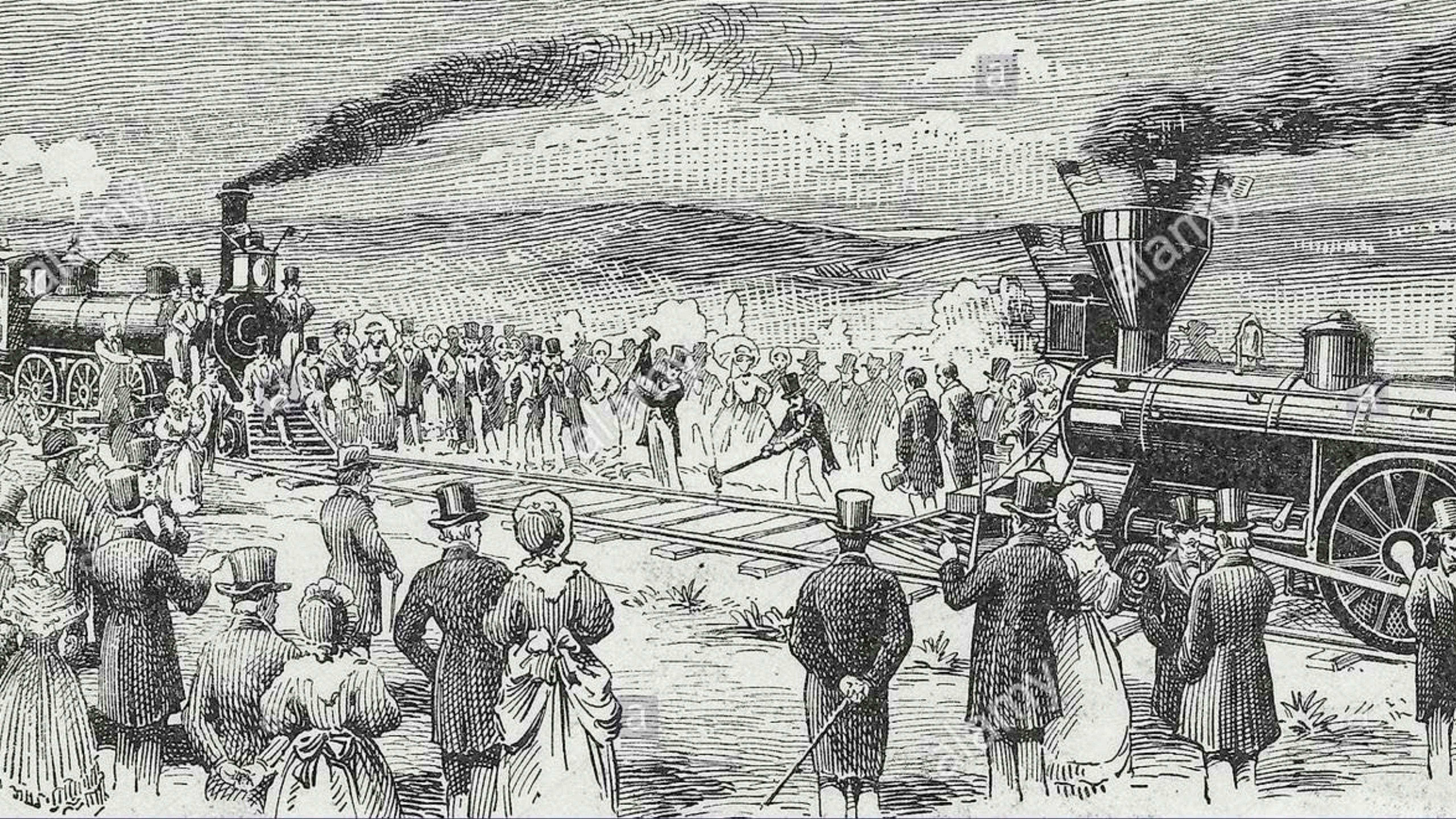
**1856, opened more businesses in Sacramento.**

**1861, co-founded the Central Pacific Railroad.**

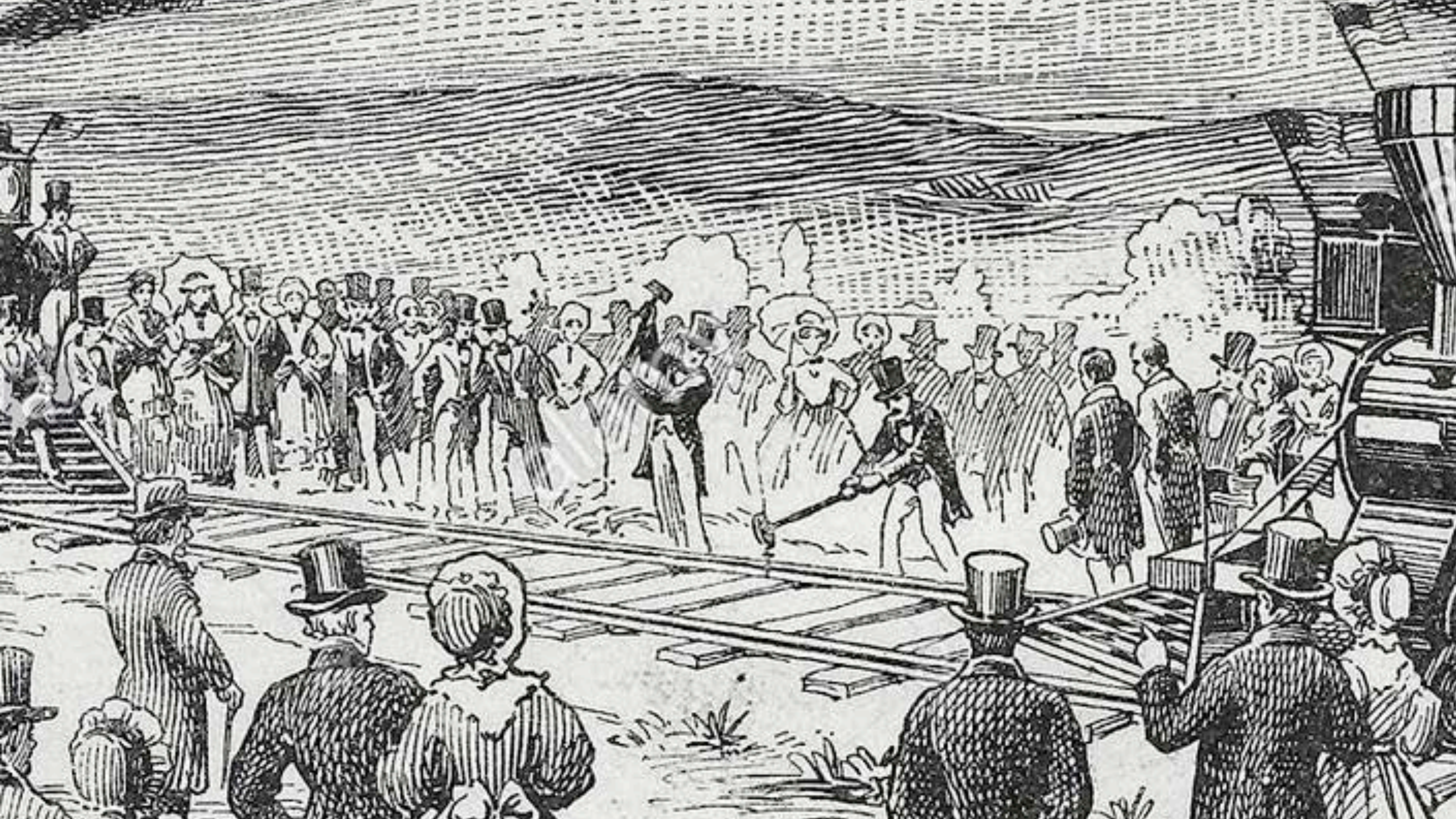
**1868, co-founded Pacific Union and then merged with Wells Fargo & Company.**

**Built the transcontinental railroad.**



























**In 1884, their only child, Leland Stanford Jr, died at 15.**



**In their grief, Leland Stanford and his wife Jane decided to launch a new venture in their son's memory, on the land they owned in Santa Clara Valley.**



# They launched an innovative new startup.



- “A university which will fit the graduate for some useful pursuit”.
- “To prohibit religious instruction, but to teach the immortality of the soul.”
- “To afford equal facilities and give equal advantages to both sexes”.
-



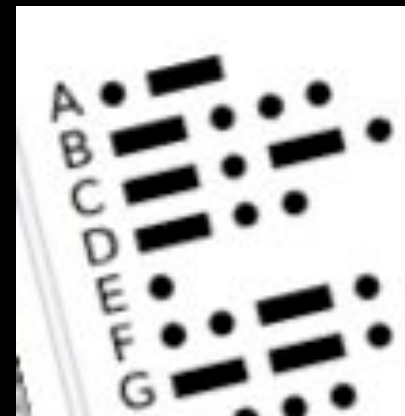


**Stanford University, Founded 1891**



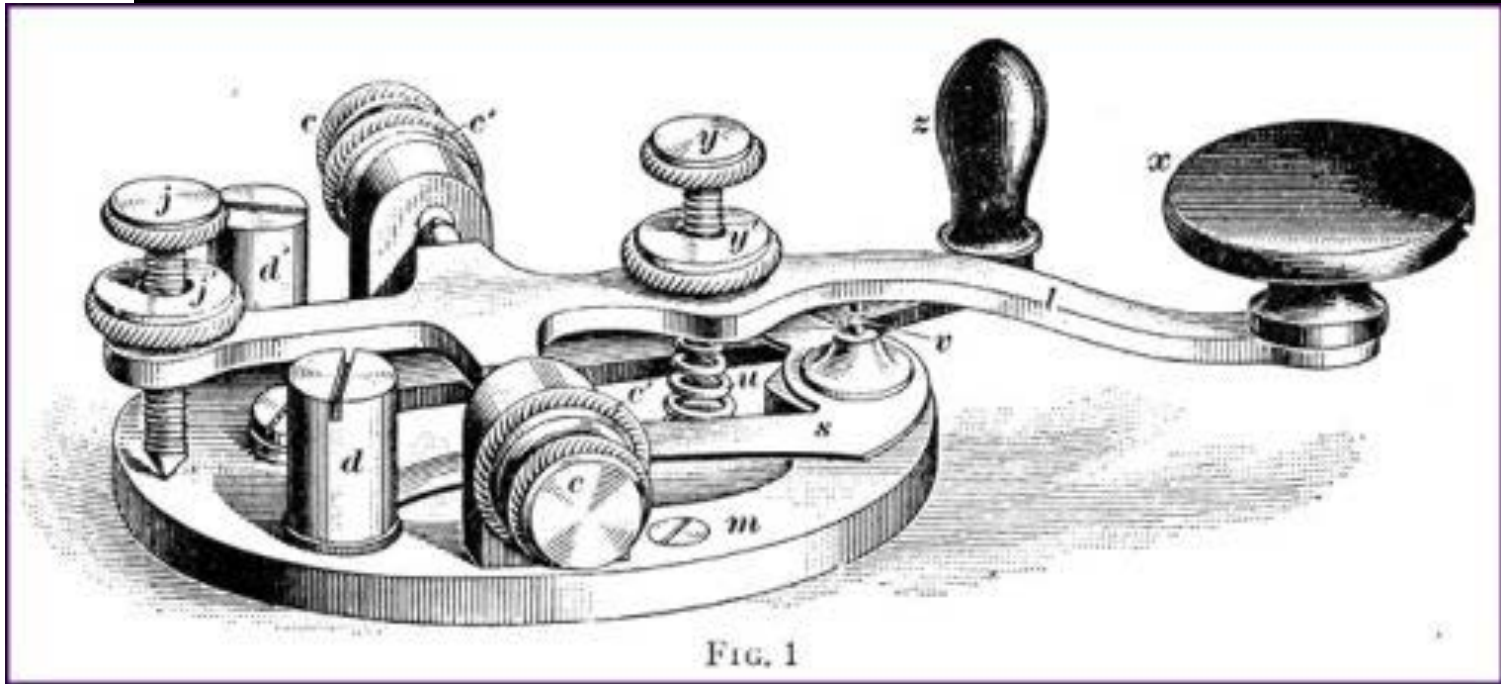
## Chapter 2:

# The First Internet.





# The Telegraph



**International Morse Code**

1. The length of a dot is one unit.  
2. A dash is three units.  
3. The space between parts of the same letter is three units.  
4. The space between letters is three units.  
5. The space between words is seven units.

A	• —
B	— •••
C	— • —
D	— • •
E	•
F	• — • —
G	• — —
H	• • • —
I	• •
J	• — — —
K	— • — •
L	• — • —
M	— — •
N	— • —
O	— — —
P	• — — •
Q	— • — •
R	• — • •
S	• • • —
T	— •
U	• • • —
V	• • • •
W	• — • —
X	— • — •
Y	— • — •
Z	— — • •

1	• — — — —
2	• • — — —
3	• • • — —
4	• • • • —
5	• • • • •
6	— • — — •
7	— • — • —
8	— • — • •
9	— • — • •
0	— — — — •



# Federal Telegraph Company, Emerson Street, Palo Alto

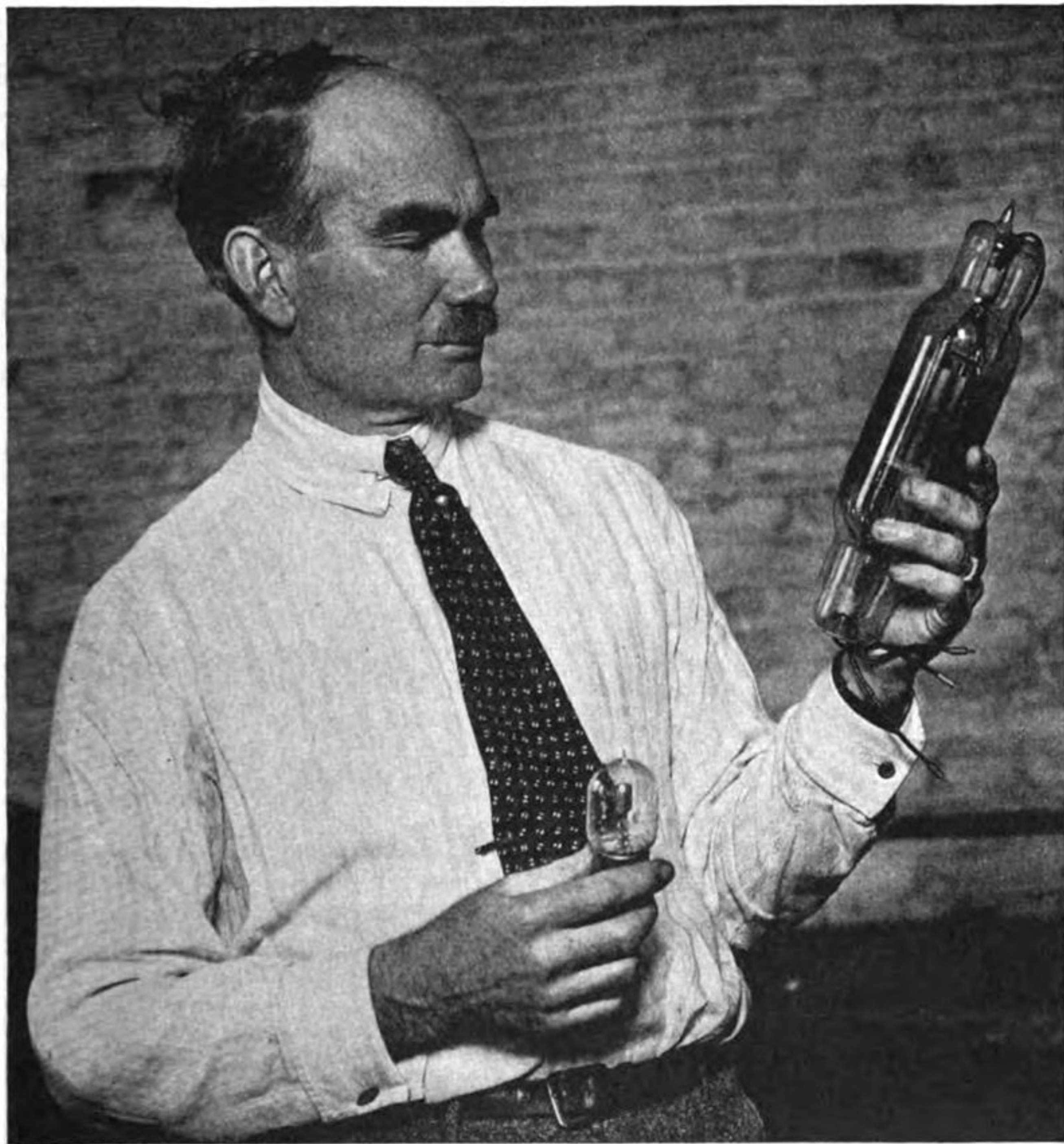




# Federal Telegraph Company, Emerson Street, Palo Alto





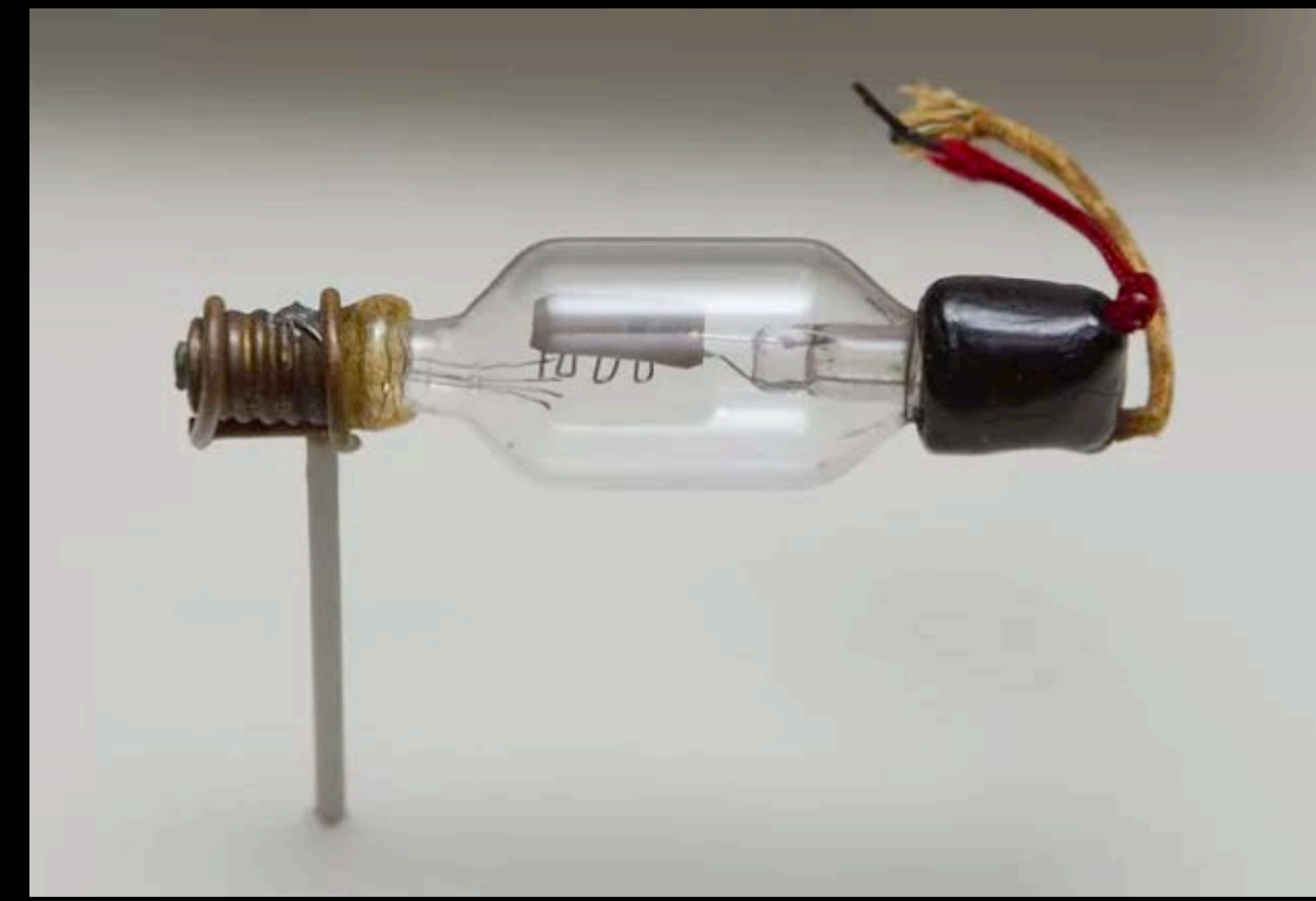


**Lee DeForest  
Federal Telegraph  
Company  
Palo Alto**

**While working on  
developing a “next-  
generation telegraph”,  
he invented of the  
vacuum tube amplifer.**



January 25, 1915 at the World's Fair in San Francisco, Lee DeForest's tube amplifier was used for the first transcontinental phone call.



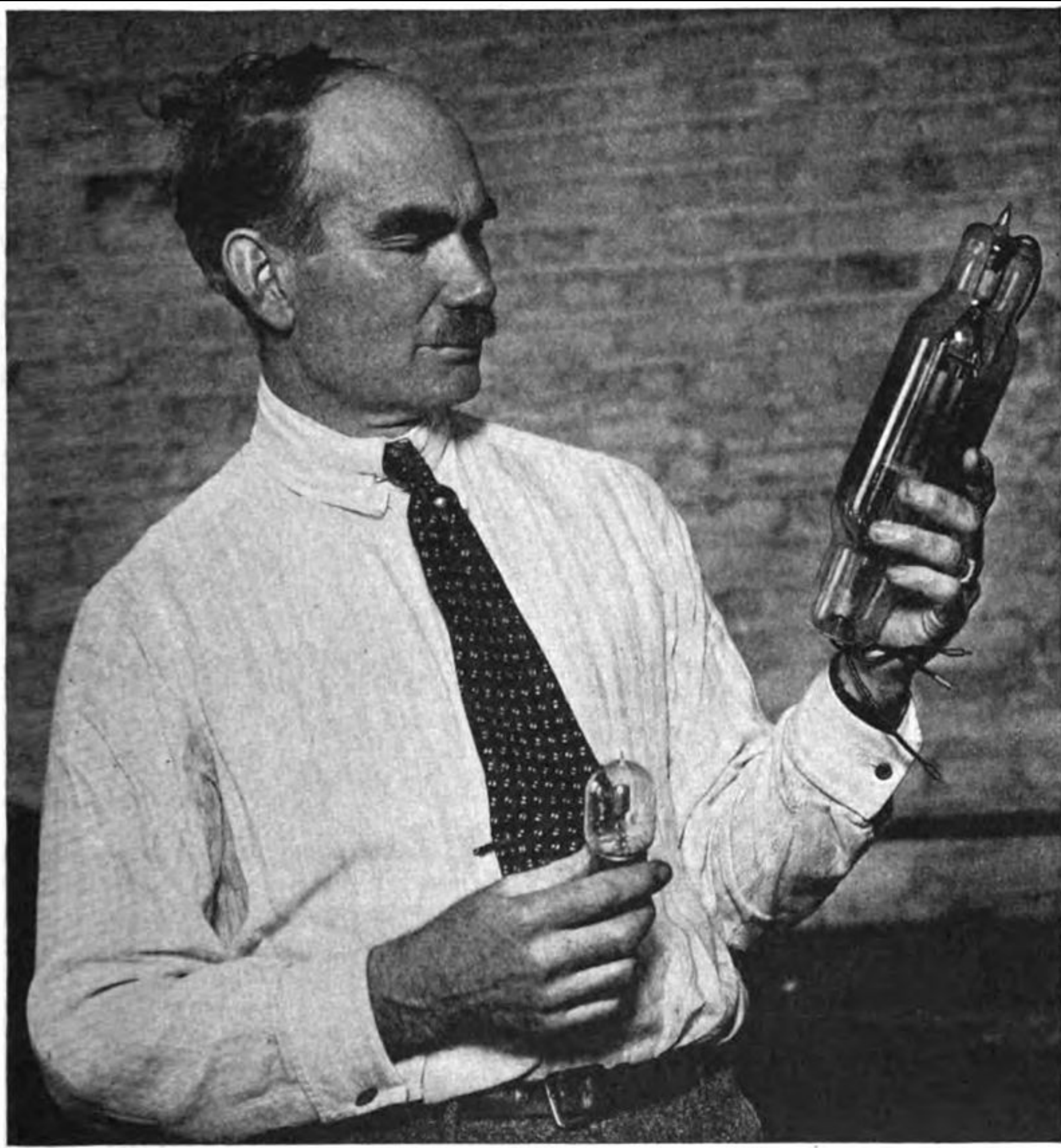


# Chapter 3:

# Tubes.

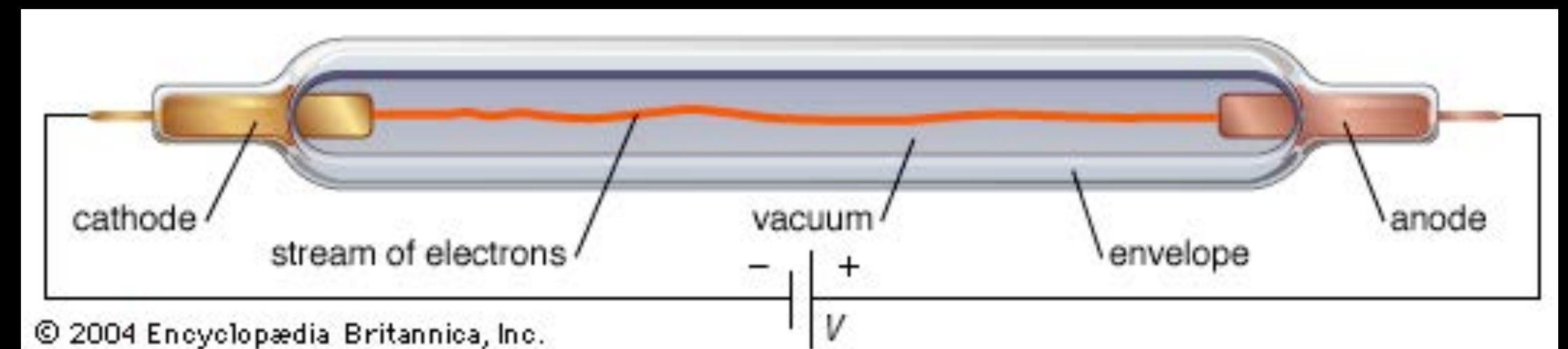




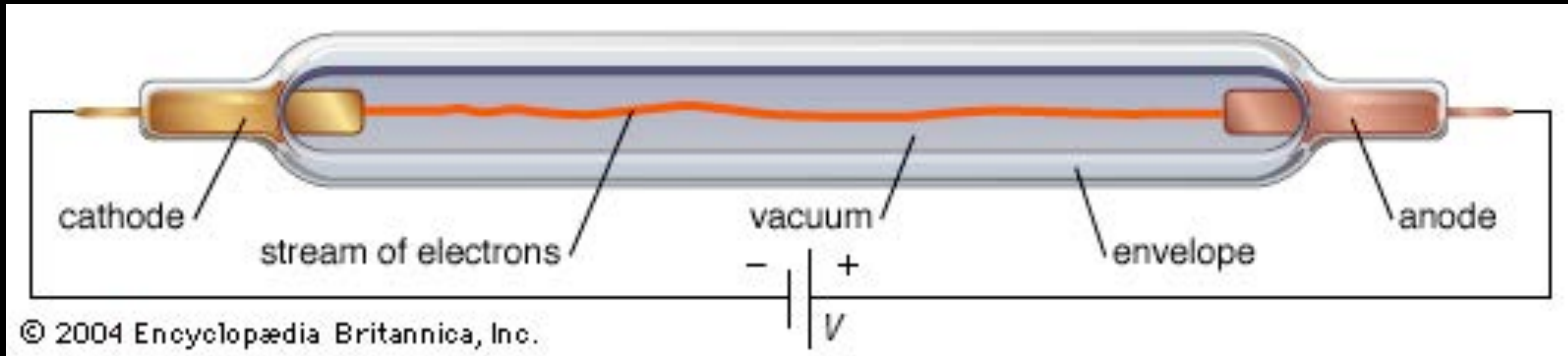


**Lee DeForest  
Federal Telegraph Company  
Palo Alto**

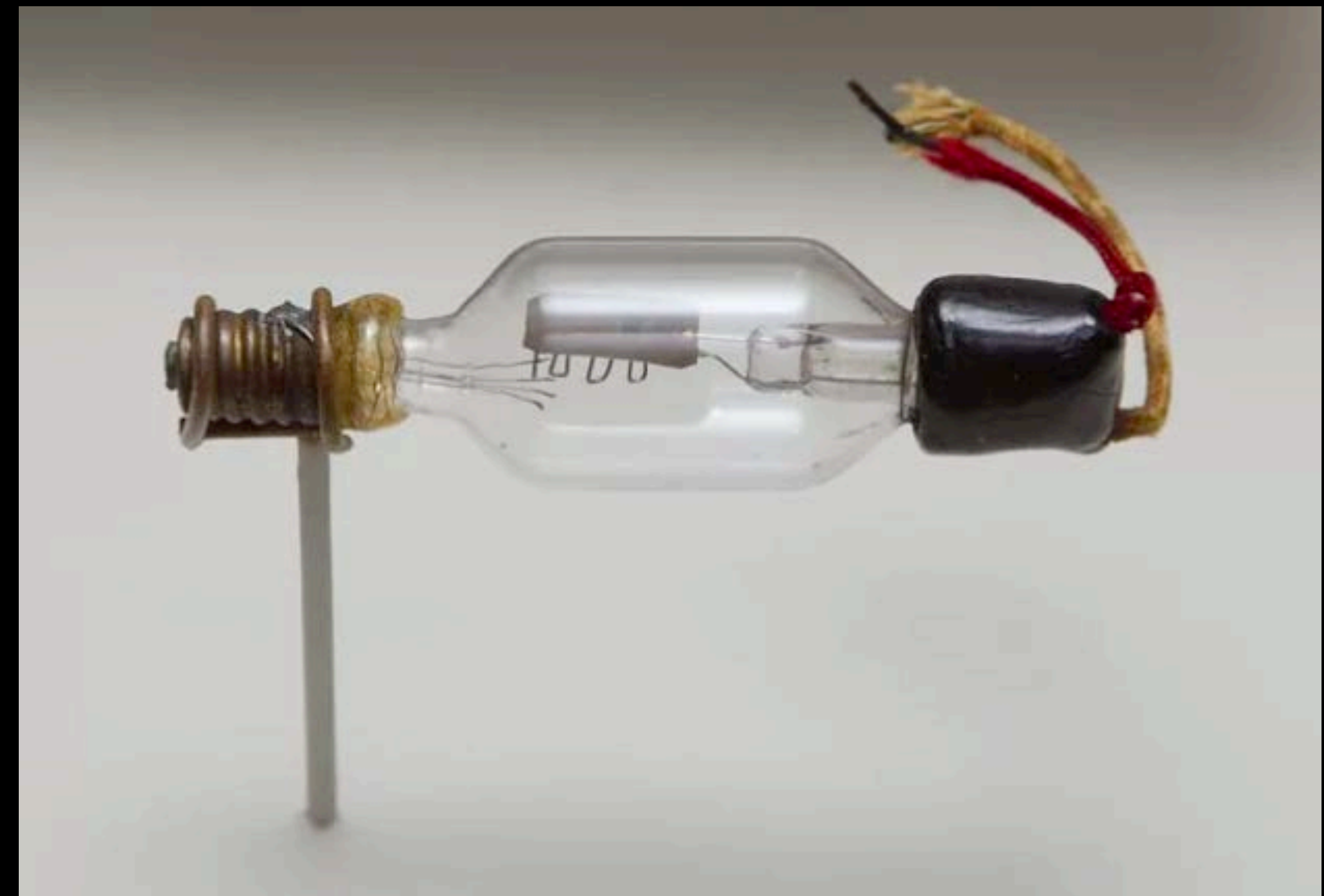
**His invention, the vacuum tube amplifier, became the one device to rule them all.**







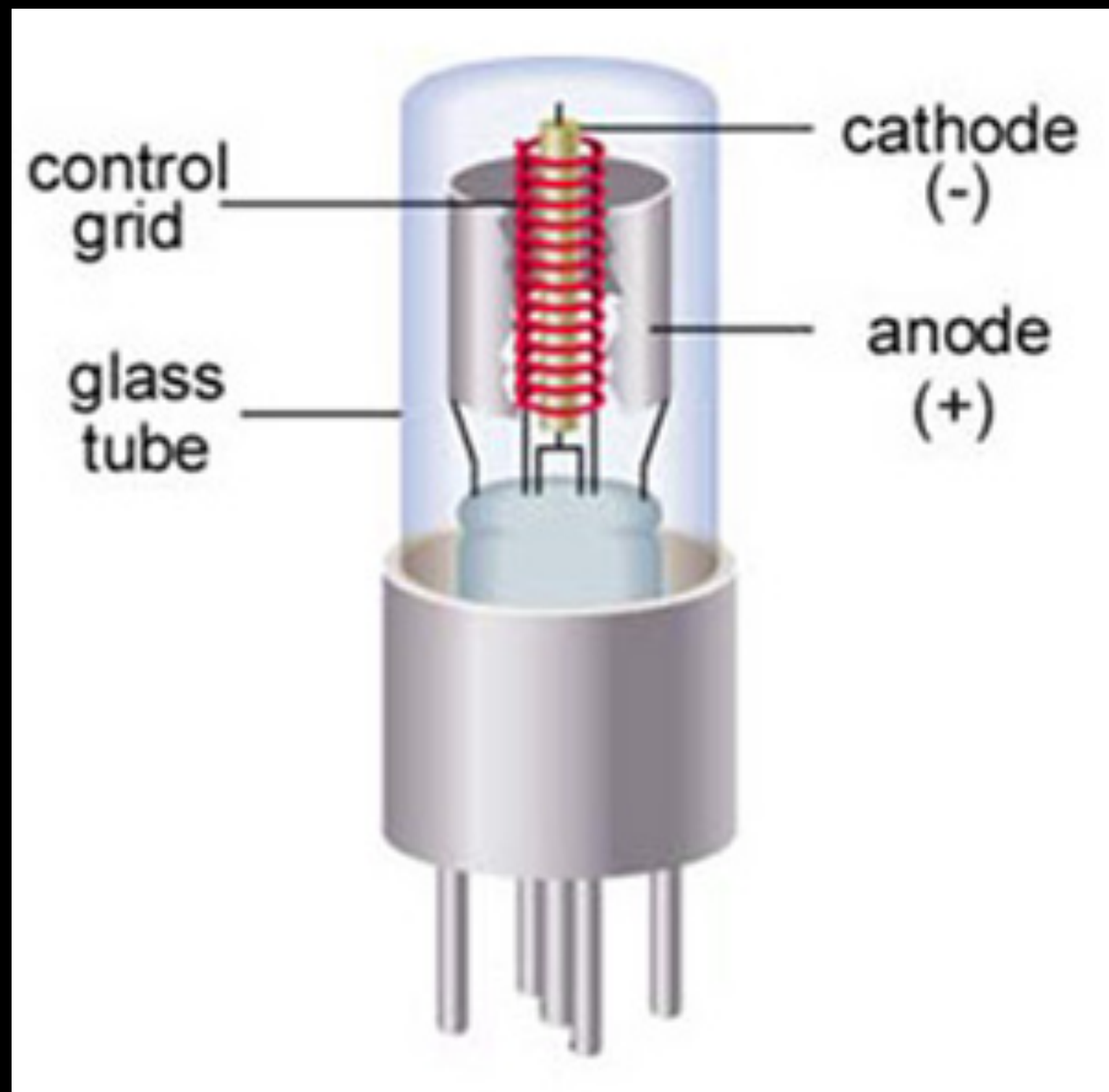
**Lee Deforest's ground-breaking invention controlled the flow of electrons and the field became known as "electron-ics".**





**Stanford University created new courses, studies, and research in this new field of “electronics”.**





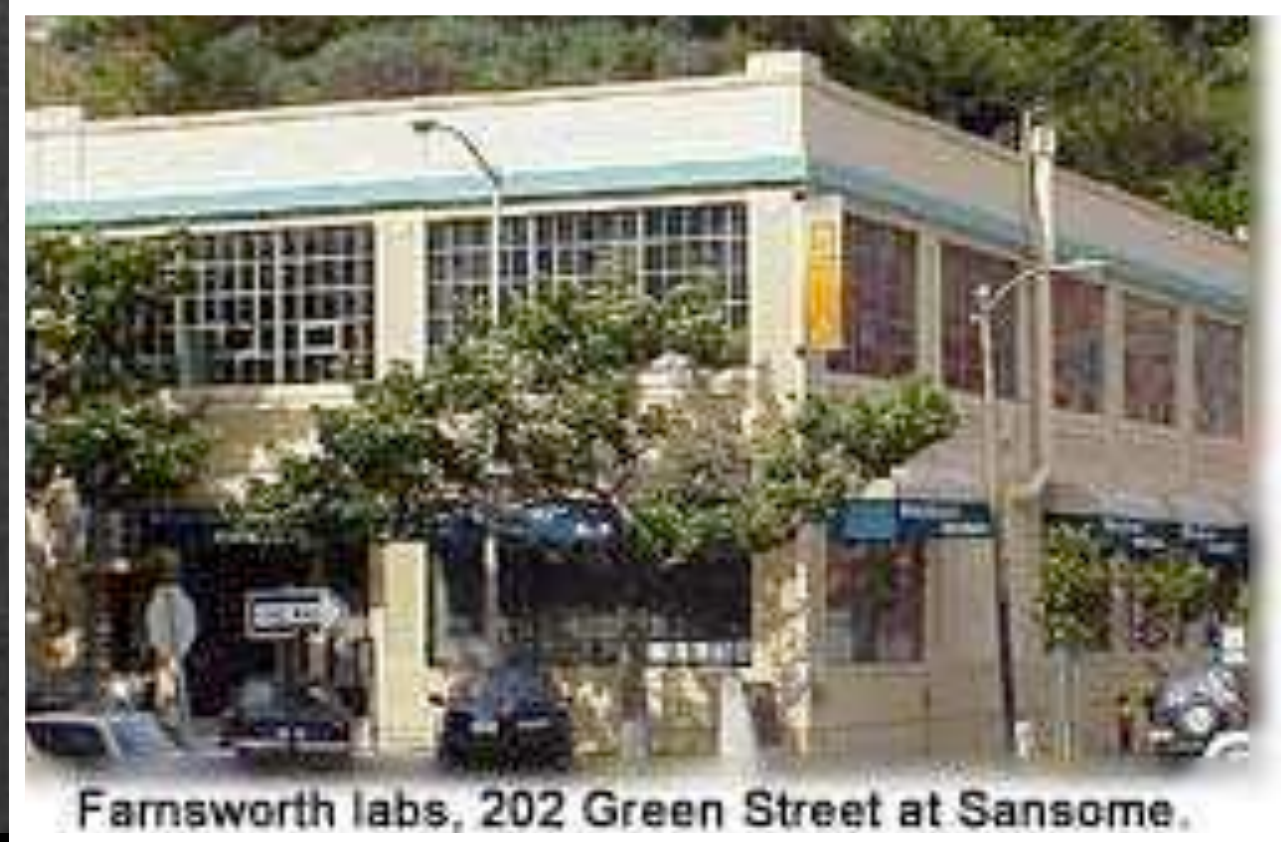
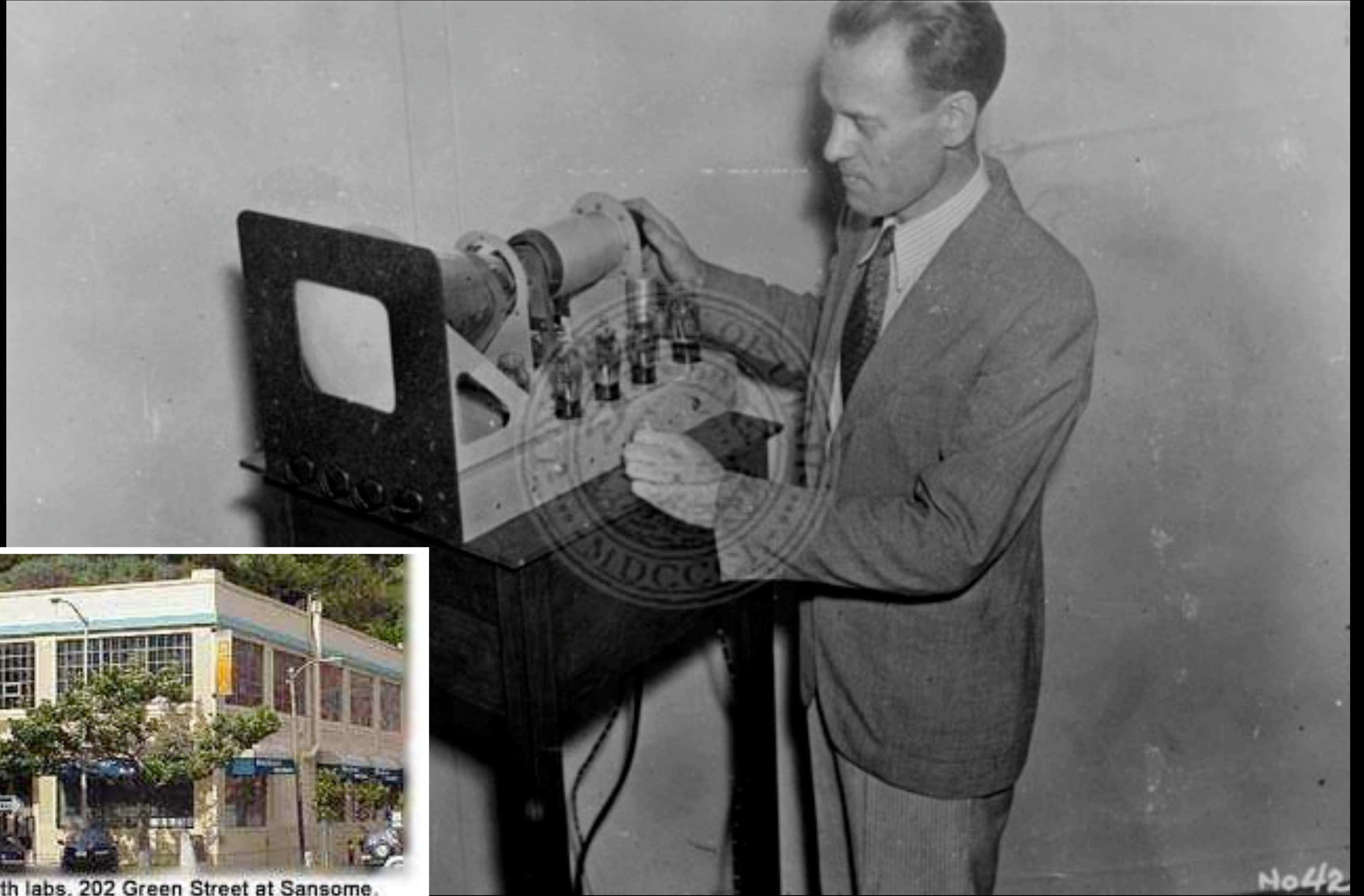
For the entire first half of the twentieth century, vacuum tubes were what drove the development of radio, television, radar, sound recording and reproduction, long distance telephone networks, home entertainment systems, and more.





# 21-year-old Philo Farnsworth, “The Genius of Green Street”

Invented the television in his lab at 202 Green Street in San Francisco.



Farnsworth labs, 202 Green Street at Sansome.

No42





**Terman started doing an innovative thing: He actively encouraged his students to found companies when they finished their studies, and he even personally invested in some of them.**

**Frederick Terman**

**Stanford University**






**Frederick Terman and two of his students,  
Bill Hewlett and Dave Packard.**



**They founded HP in this garage, at 367 Addison Avenue in Palo Alto.  
It's still there.**





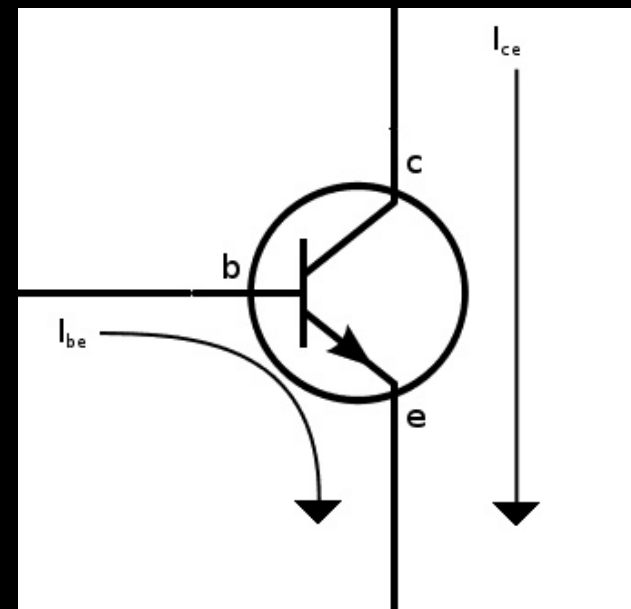


**The HP200A oscilloscope.**  
**Their first customer was Disney.**  
**They bought 8 units at \$71.50 each,**  
**for use in making the movie**  
***Fantasia.***



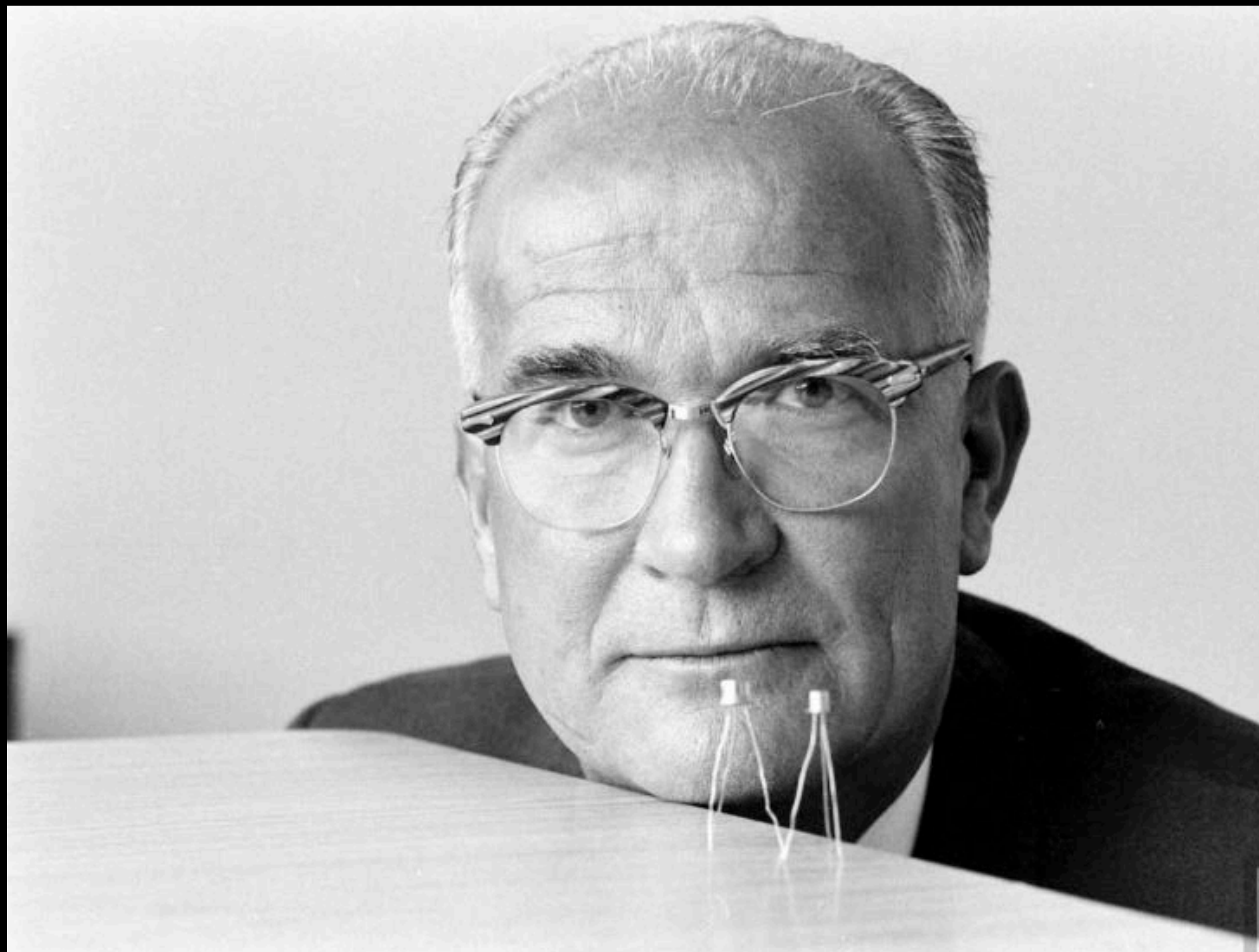
## Chapter 4:

# Transistors.





**William  
Shockley:  
A Palo Alto guy  
wins the Nobel  
prize in physics,  
1956.**





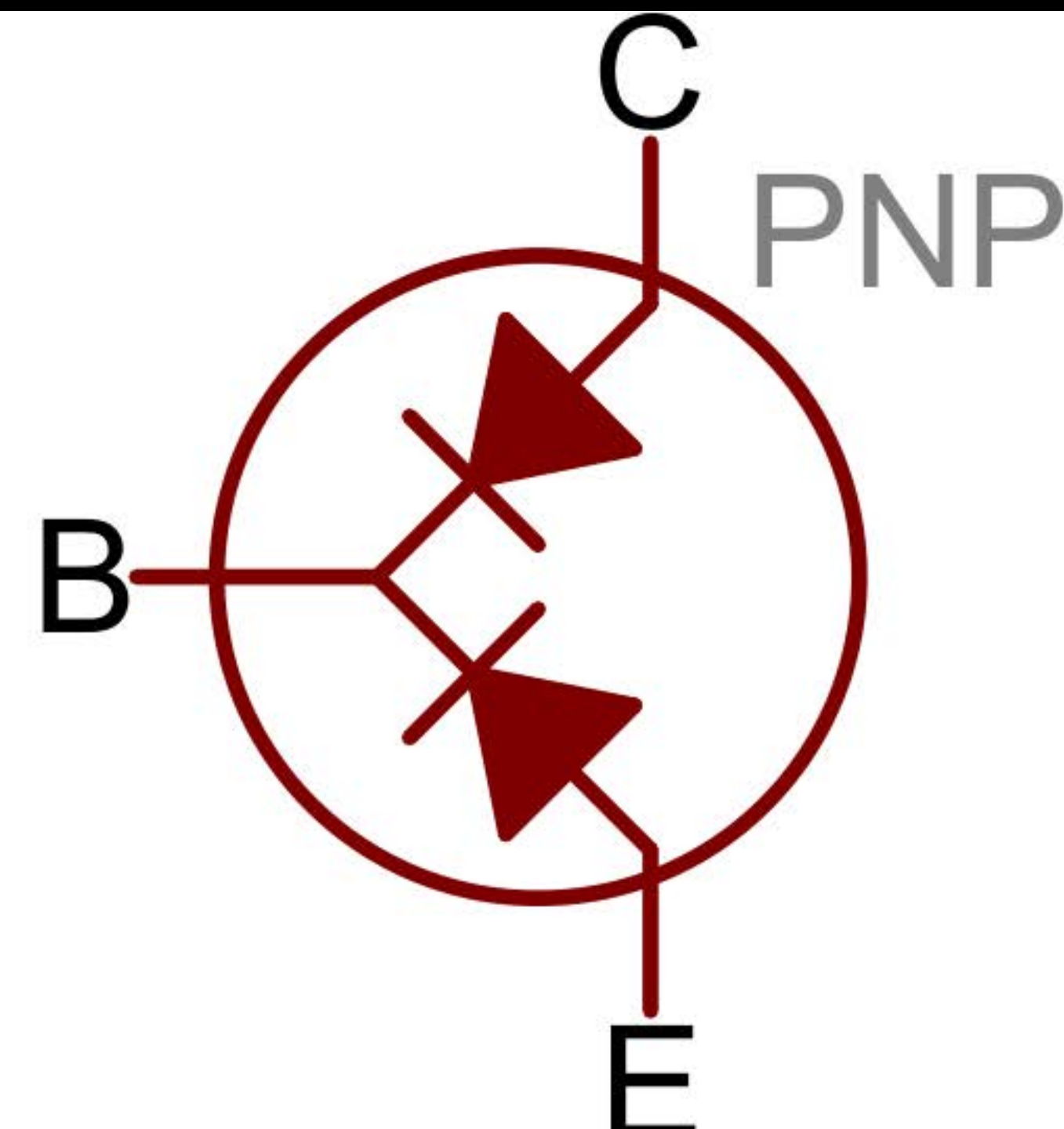
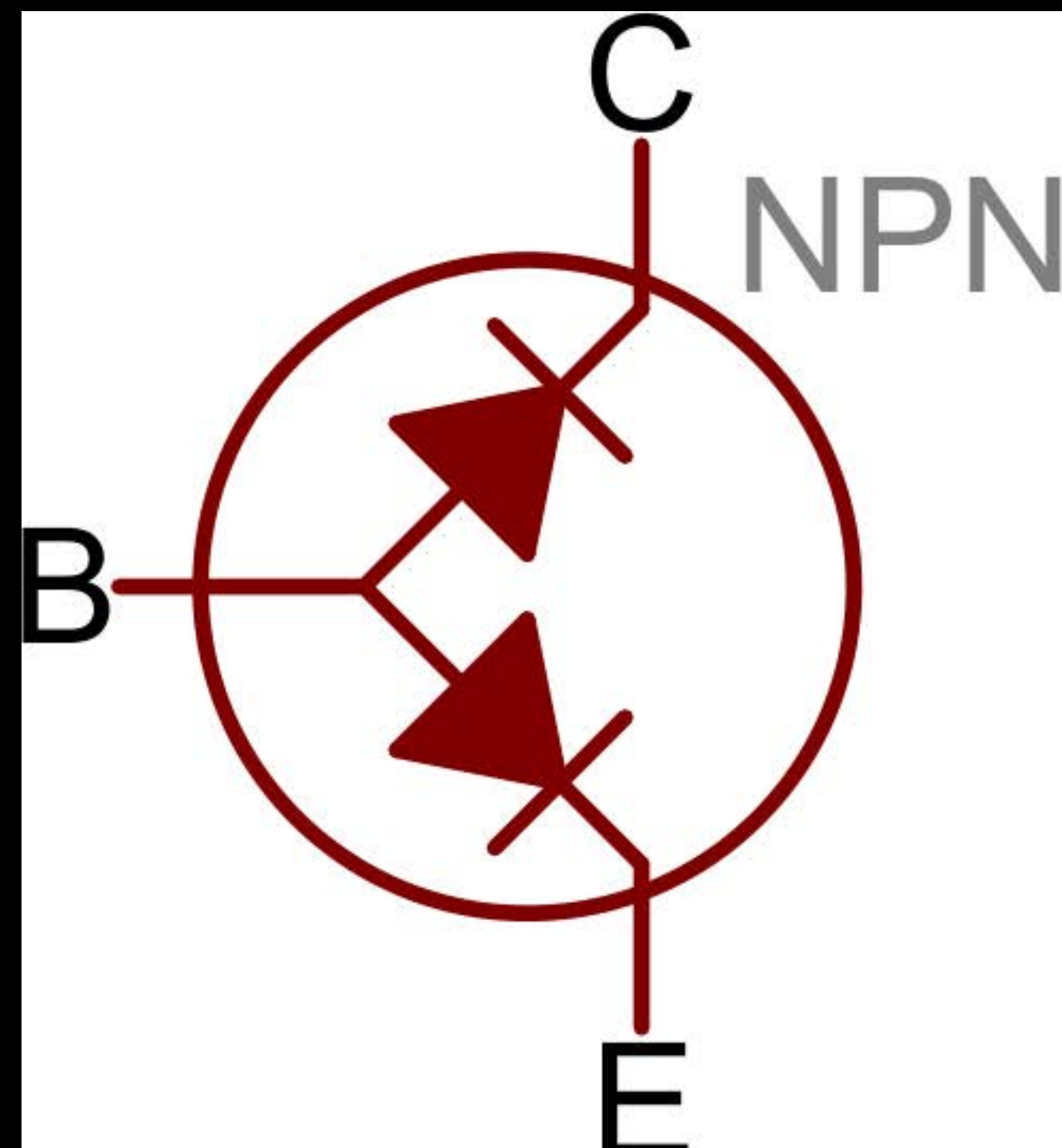


**Transistors.**

LIFE



**The Transistor did everything a vacuum tube did,  
but was smaller, faster, cheaper to manufacture,  
and consumed less energy.**

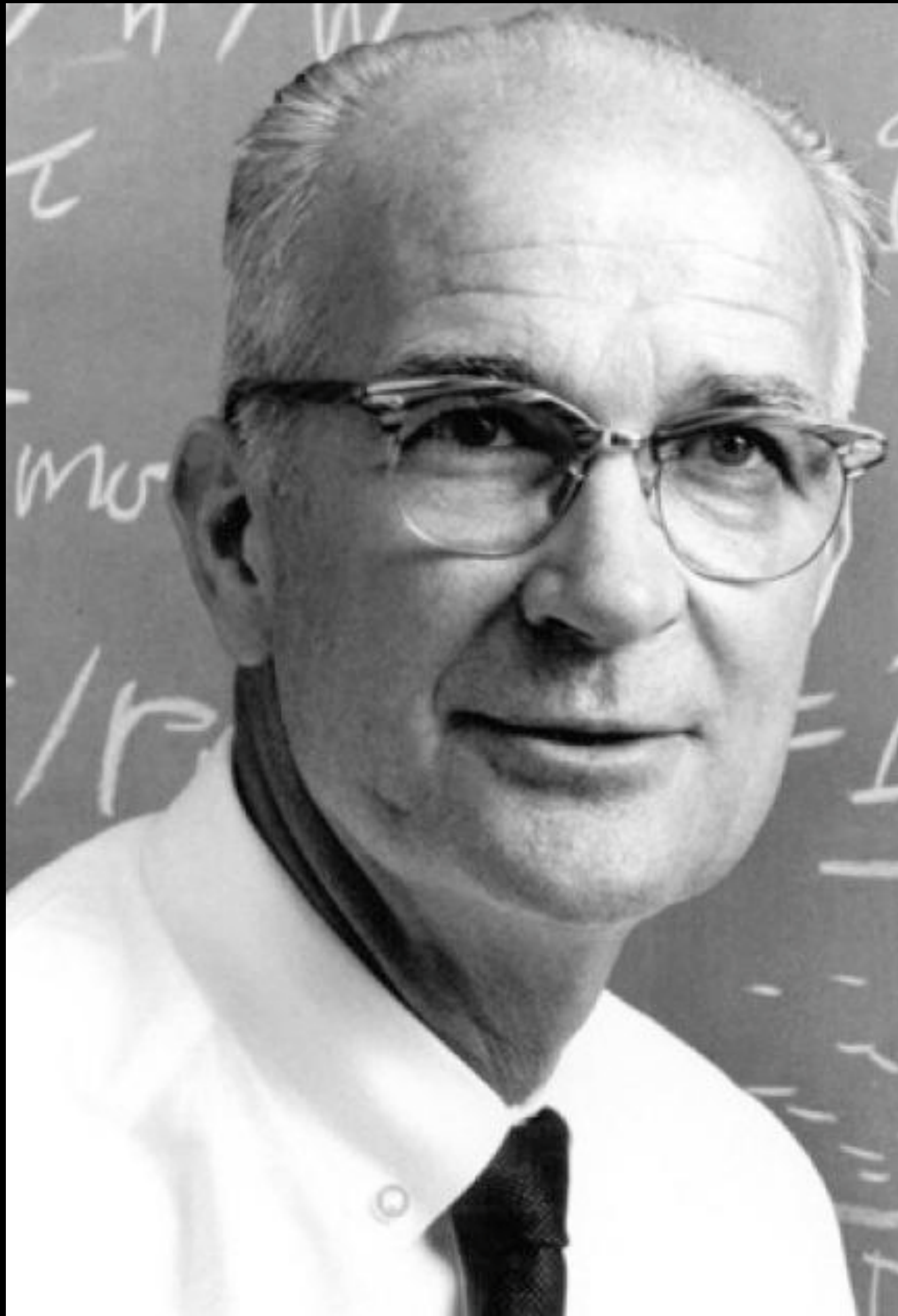




# 391 San Antonio Road, Mountain View, California







# **William Shockley**

**Brilliant technology guy.  
Terrible manager.**







**Eight top employees of Shockley Semiconductor quit to create their own startup.**





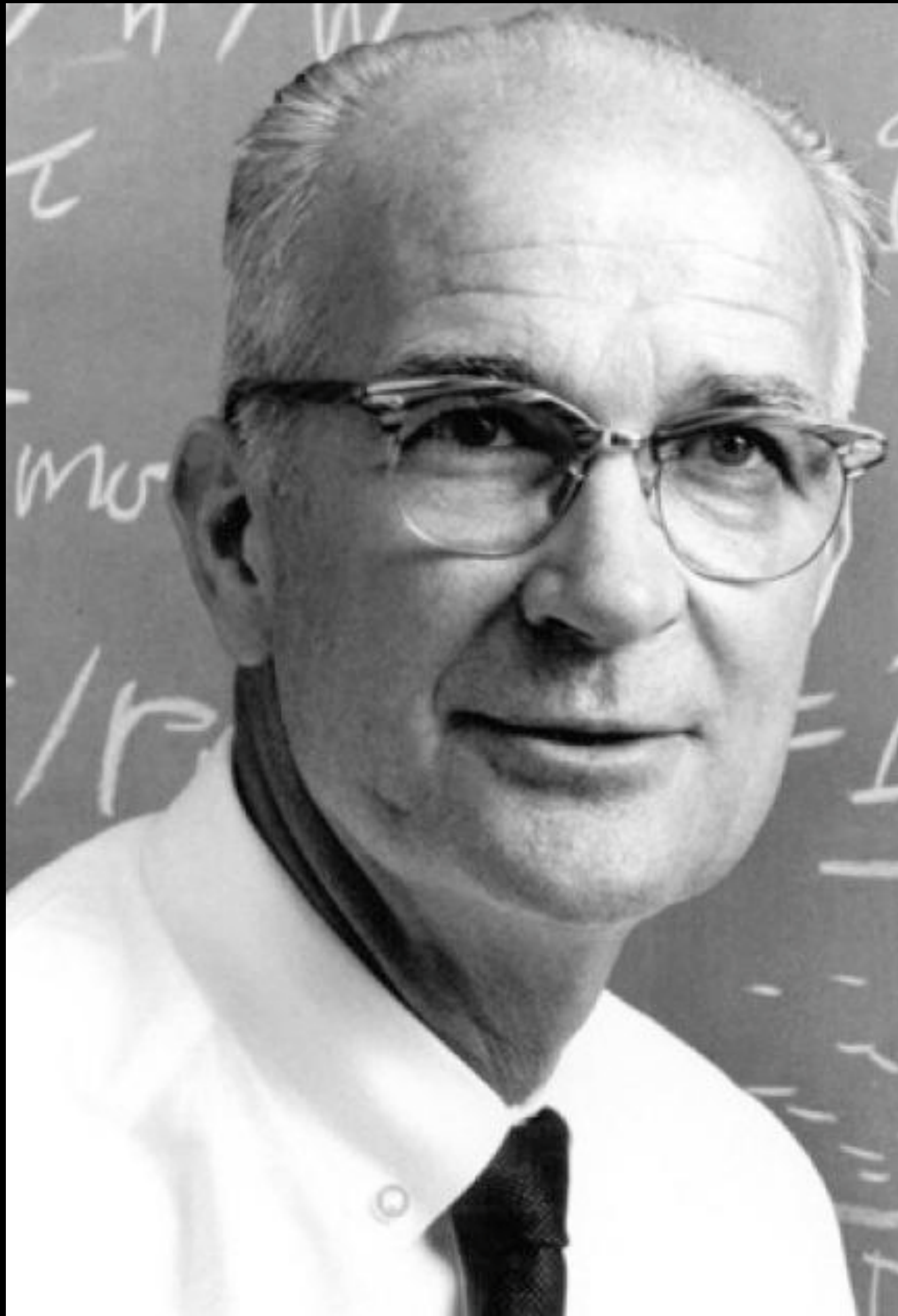




**Signed by the founders of Fairchild Semiconductor, in lieu of a partnership document.**







**William Shockley, their former employer, tried to sue them, citing non-compete agreements they had signed.**



# California law:

***“Every contract by which anyone is restrained from engaging in a lawful profession, trade, or business of any kind is to that extent void.”***





**In California, non-compete agreements are  
unenforceable. #winning**





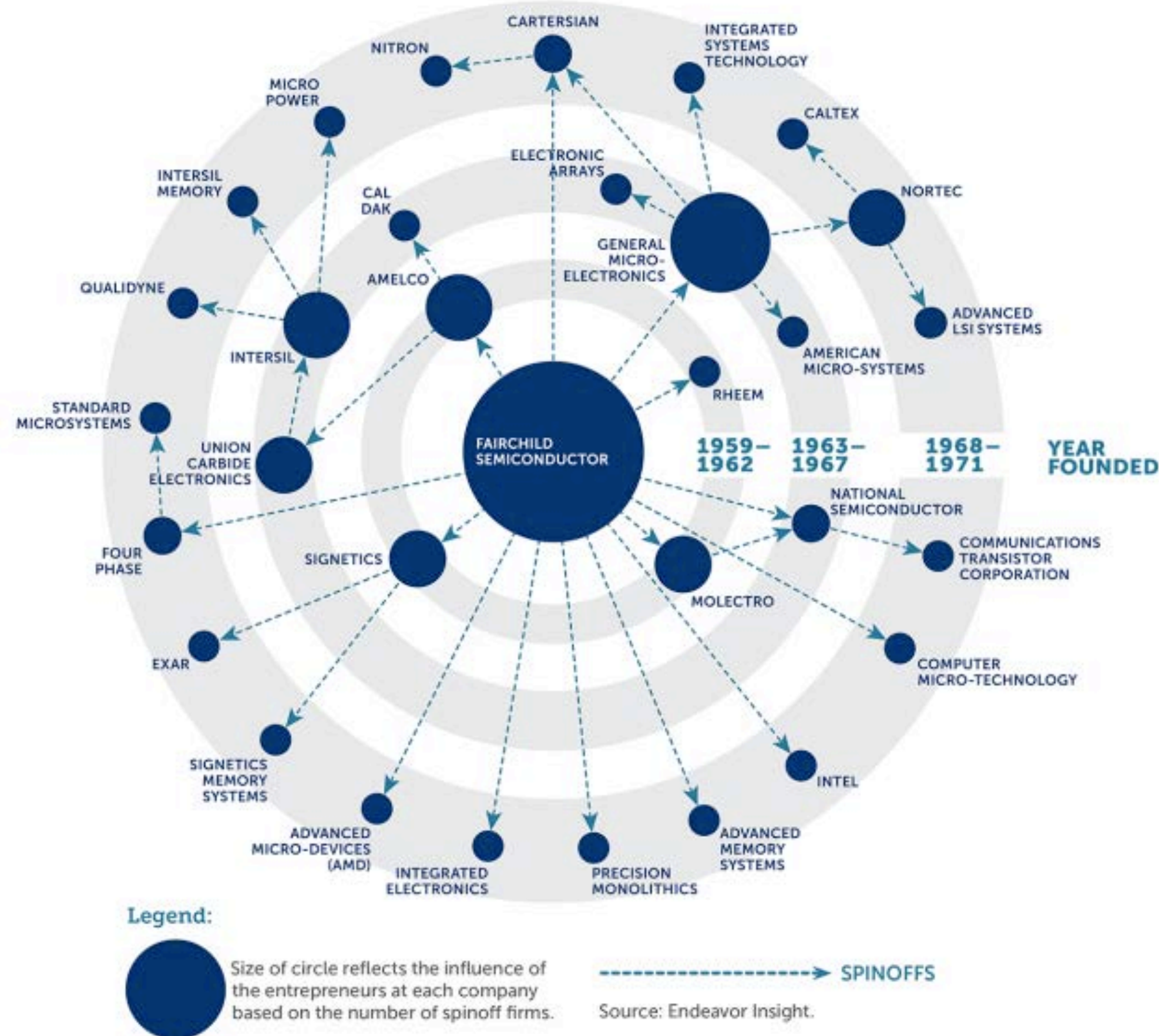
# Fairchild Semiconductor

## 844 Charleston Road, Palo Alto.





## THE CREATION OF SILICON VALLEY: GROWTH OF THE LOCAL COMPUTER CHIP INDUSTRY



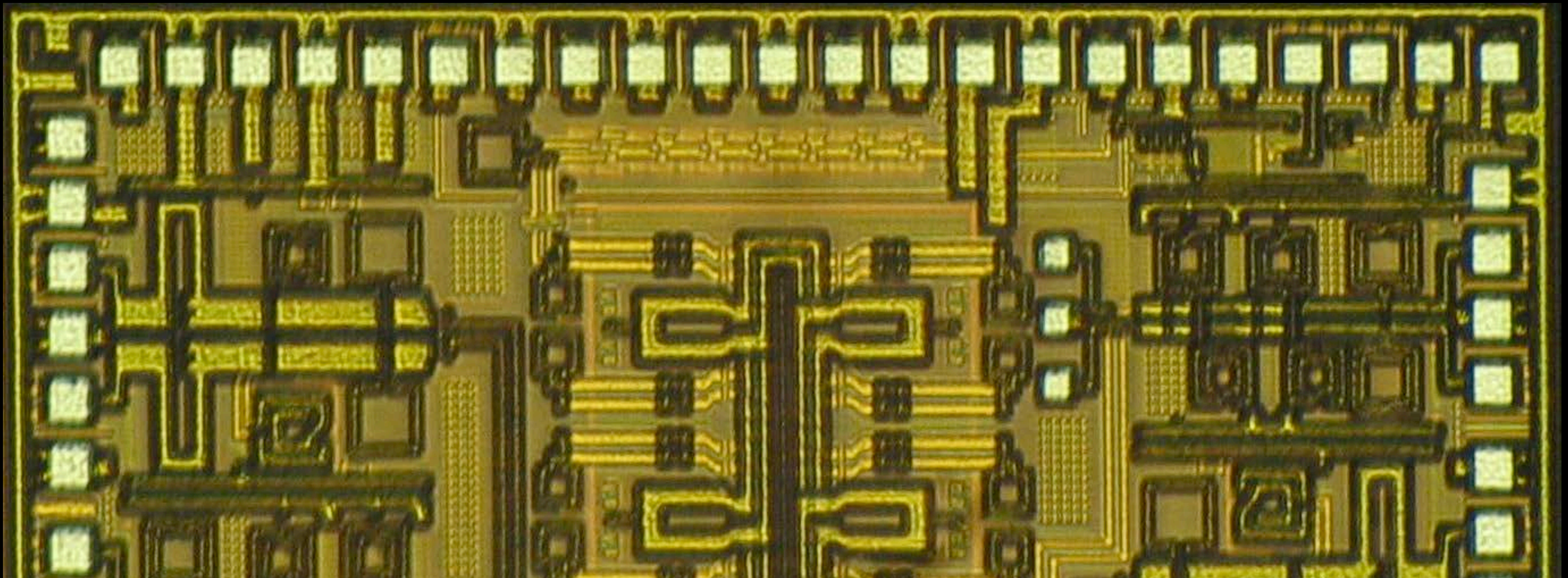
**Today there are 92 publicly-listed companies that can be traced back to Fairchild.**

**They are worth over \$2.1 trillion, more than the annual GDP of Canada, India, or Spain.**

**They employ over 800,000 people.**



In 1959, Robert Noyce and Gordon Moore at **Fairchild Semiconductor** started working on a new innovation:  
**Multiple microscopic transistors a single semiconductor chip.**  
A complete integrated circuit.





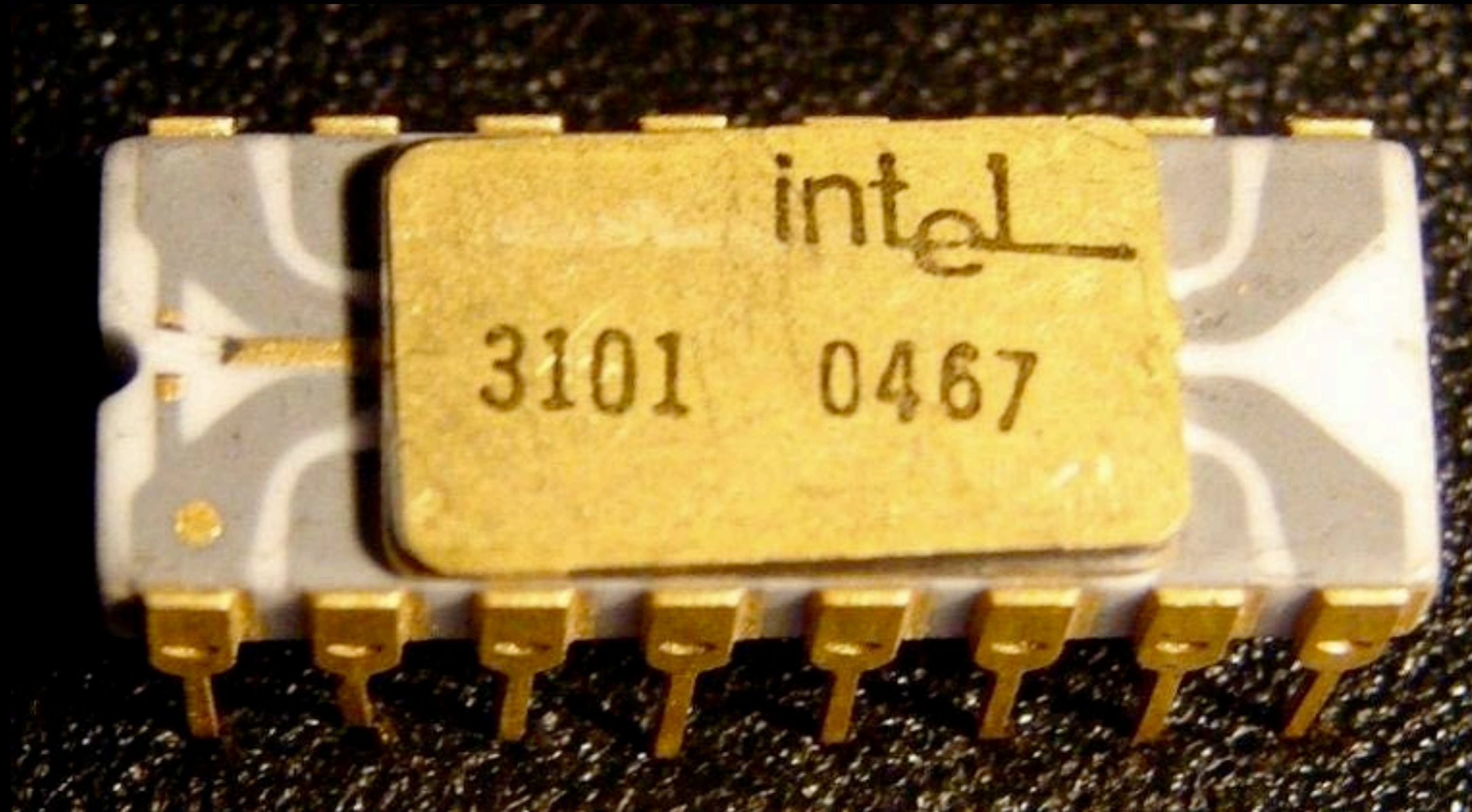
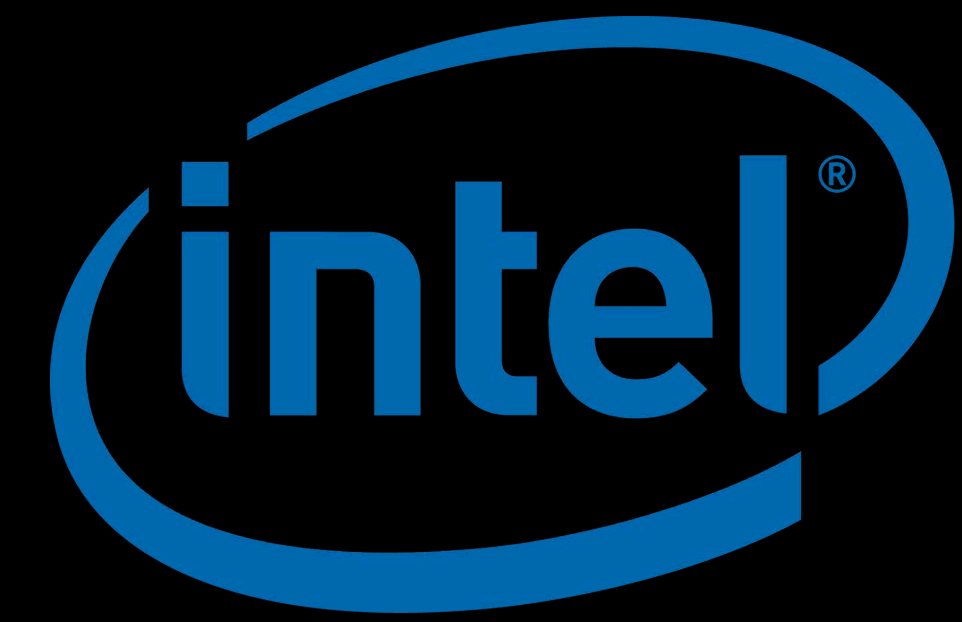


**Gordon Moore**

**Robert Noyce**

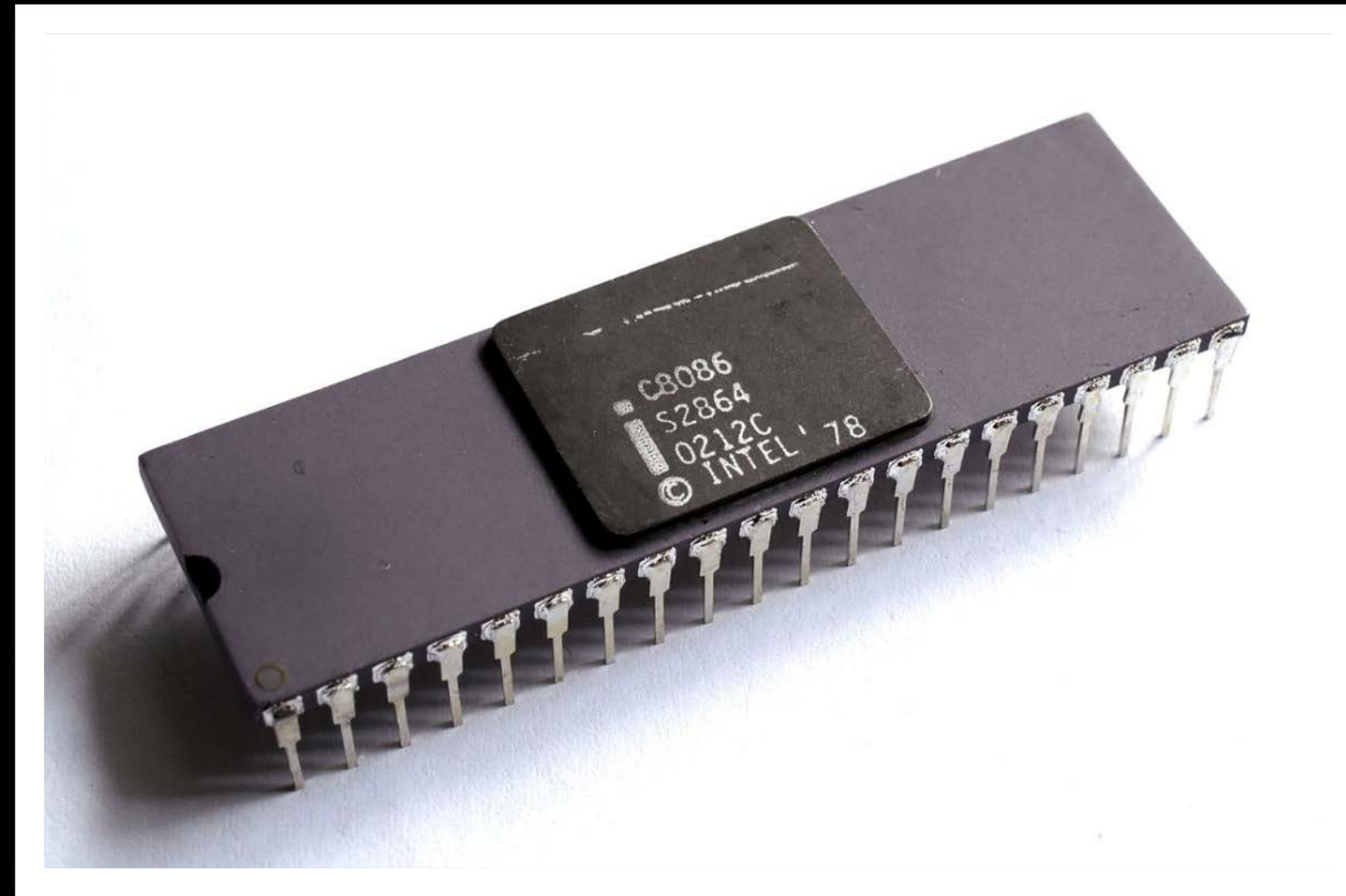


**The first Intel product:  
384 transistors on one chip.**





# What's the key manufacturing ingredient?



**Silicon.**





# Electronic

★

New York, N.Y., Monday, January 11.

## SILICON VALLEY U.S.A.

(This is the first of a three-part series on the history of the semiconductor industry in the Bay Area, a behind-the-scenes report of the men, money, and litigation which spawned 23 companies — from the fledgling rebels of Shockley Transistor to the present day.)

By DON C. HOEFLE

It was not a vintage year for semiconductor start-ups. Yet the 1970 year-end box score on the San Francisco Peninsula and Santa Clara Valley of California found four more new entries in the IC sweeps, one more than in 1969.

The pace has been so frantic that even hardened veterans of the semiconductor wars find it hard to realize that the Bay Area story covers an era of only 15 years. And only 23 years have passed since the invention of the transistor, which made it all possible.

For the story really begins on the day before Christmas Eve, Dec. 23, 1947. That was the day, at Bell Telephone Laboratories in Murray Hill, N.J., three distinguished scientists, Dr. John Bardeen, Dr. Walter Brattain and Dr. William Shockley, demonstrated the first successful transistor. It was made of germanium, a point-contact device that looked something like a crystal detector, complete with cat's whiskers.

The three inventors won the Nobel Prize for their efforts, but only one of them, Dr. Shockley, was determined to capitalize on the transistor commercially. In him lies the genesis of the San Francisco silicon story.

It was only by a quirk of fate, however, coupled with lack of management foresight, that Boston failed to become the major semiconductor center San Francisco is today. When Dr. Shockley left Bell Labs in 1954, he headed first for New England to become a consultant to Raytheon Co., with a view toward establishing a semiconductor firm there under its auspices.

His financial plan called for a guarantee to him of \$1 million over a 3-year period — hardly unreasonable by today's standards. But the Raytheon management 16 years ago couldn't see it, so Dr. Shockley left the company after only 1 month.

See SILICON, Page 4



★

New York, N.Y., Monday, January 11.

# SILICON VALLEY U.S.A.

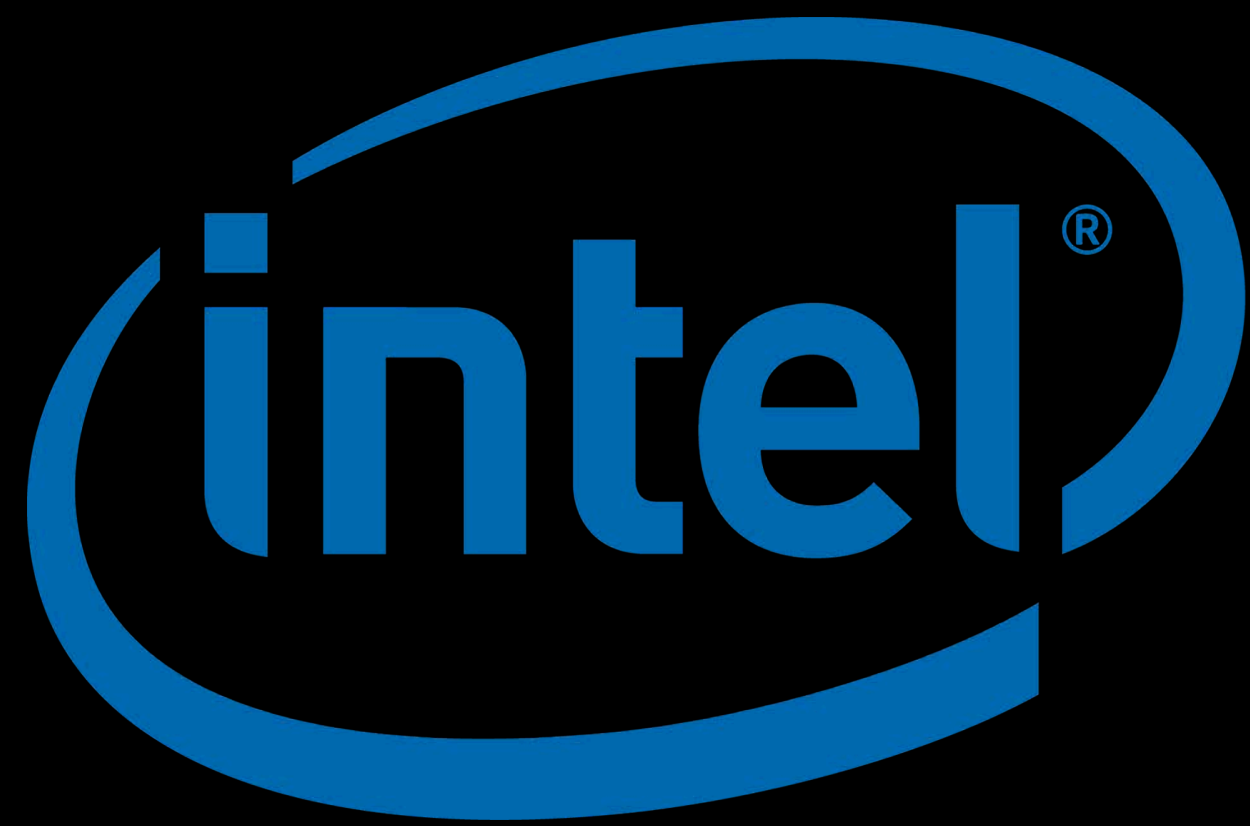
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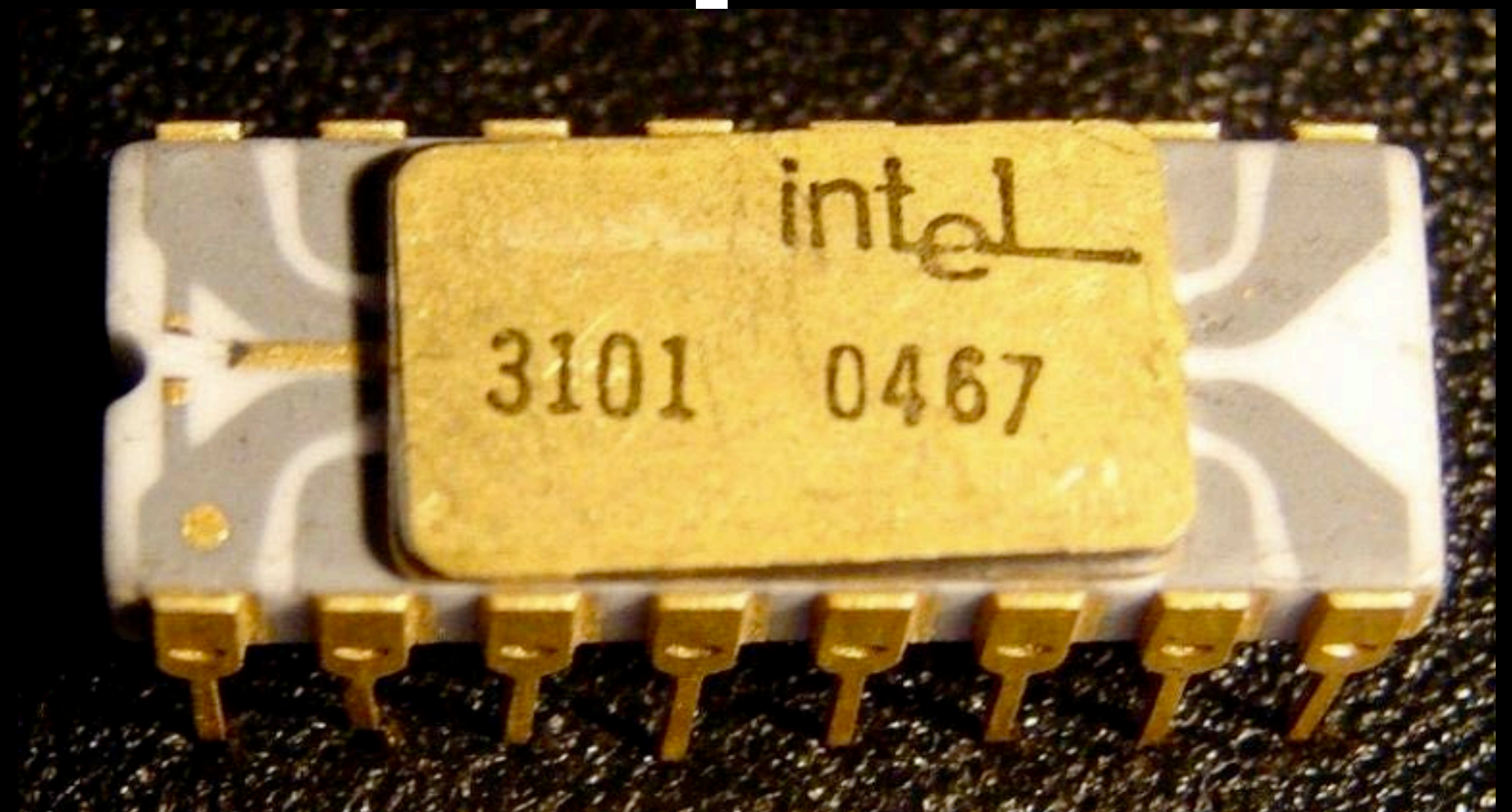
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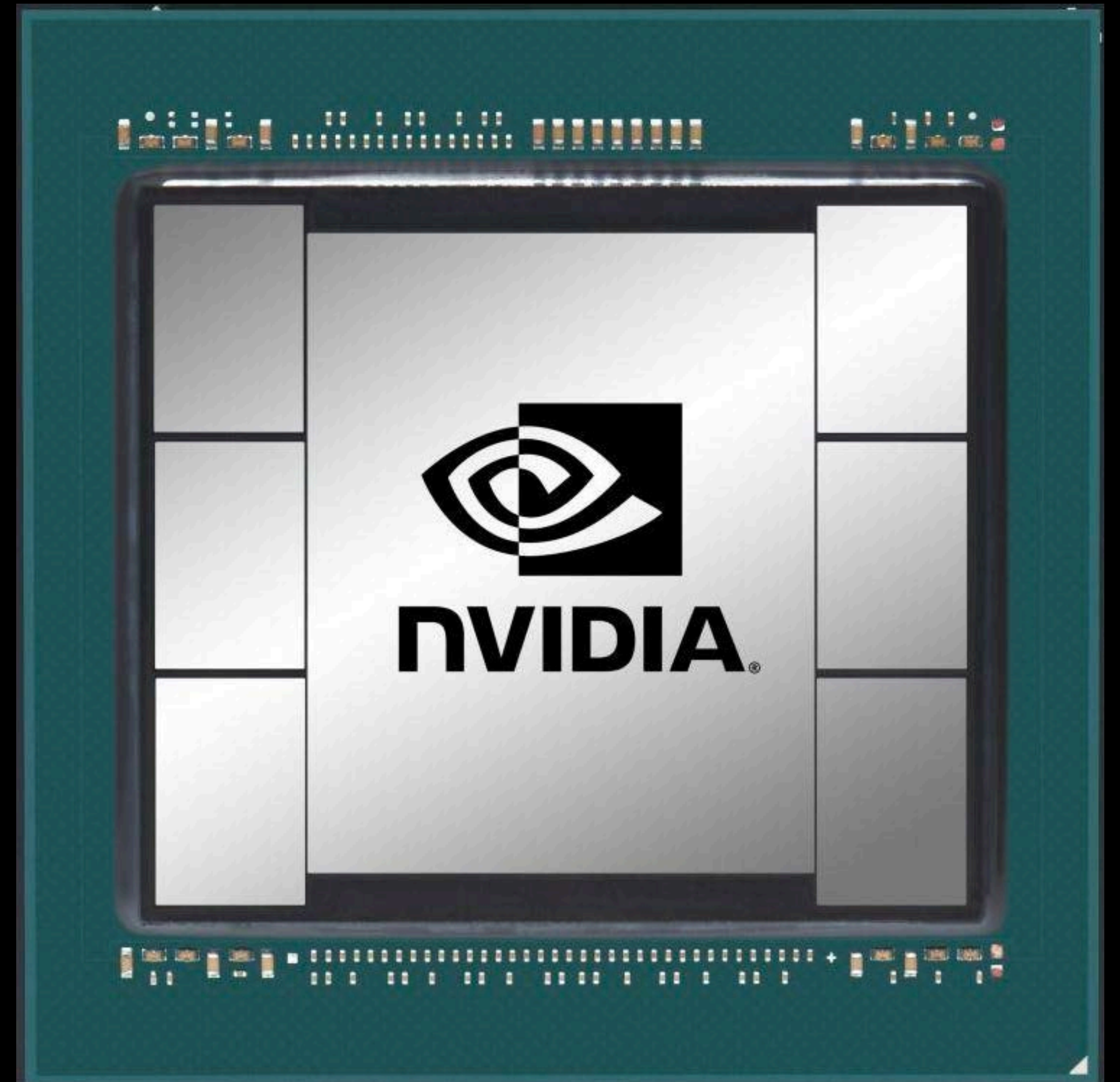


**The first Intel product:  
384 transistors on one chip.**





**Today NVIDIA makes chips with 54 billion transistors.  
Headquartered in Santa Clara, CA**





# Chapter 5:

# Money.



Courtesy of Special Collections, Stanford University Libraries







**Eugene Kleiner**







**KLEINER PERKINS**

**Sand Hill Road**

**This Venture Capital firm has funded Amazon, Google, Skype, AOL, Spotify, Slack, DocuSign, Brio Technology, Electronic Arts, Flextronics, Genentech, Hybritech, Intuit, Lotus Development, LSI Logic, Macromedia, Netscape, Quantum, Segway, Sun Microsystems Tandem Computers, and many more.**





Today, this one road has the highest density of venture capital firms in the world.

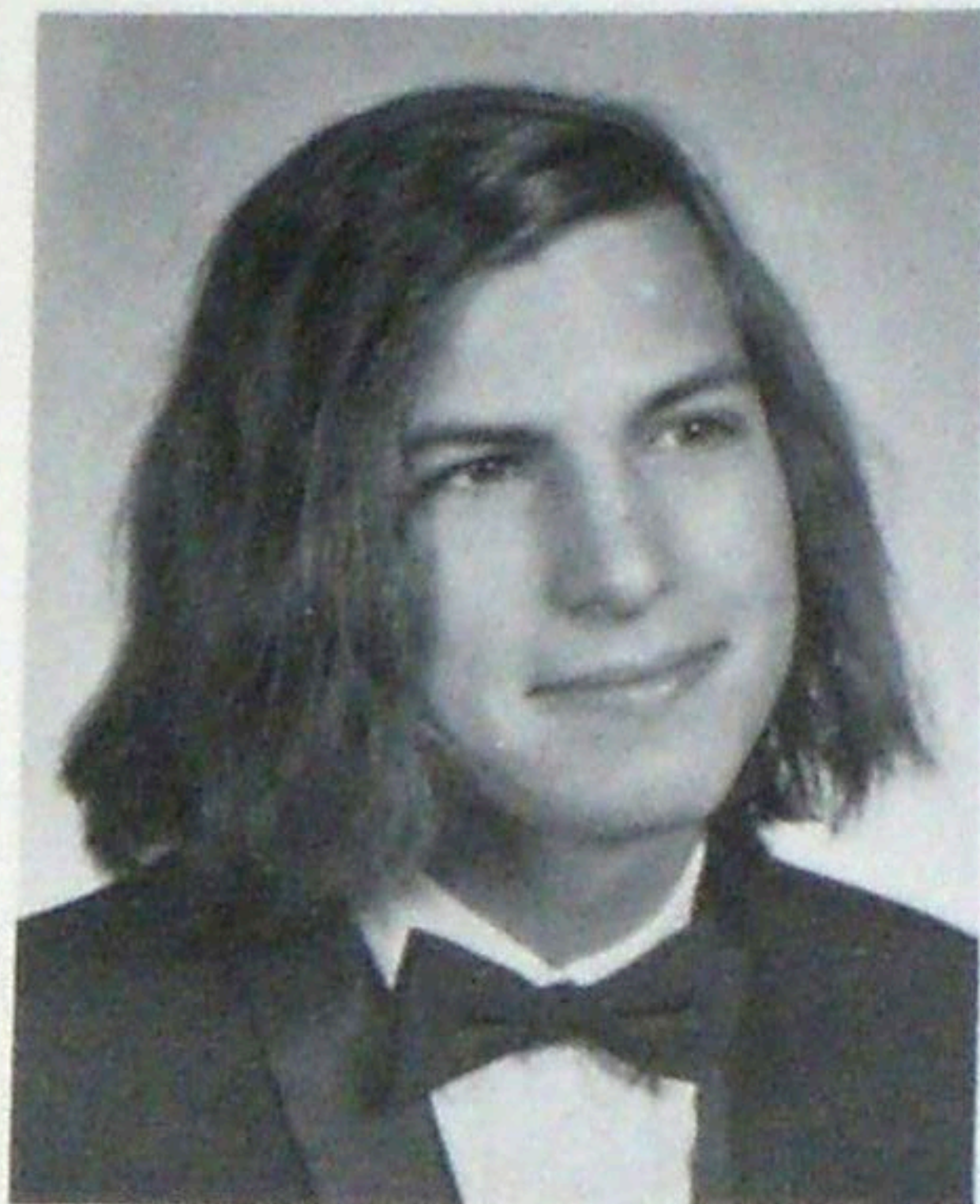




# Chapter 7: The Personal Computer.







Stephen Jobs

# Bill Hewlett

Biography



HP Corporate Archives

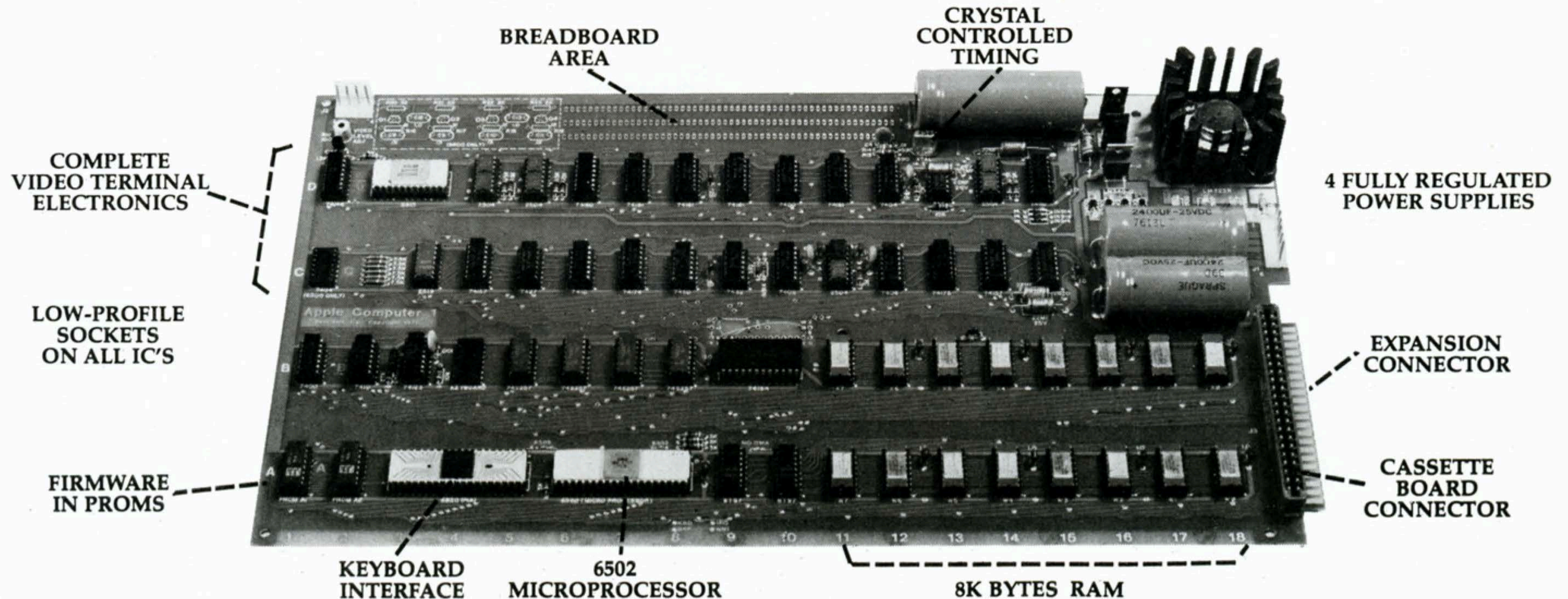








# The Apple I.



**APPLE Computer Company • 770 Welch Rd., Palo Alto, CA 94304 • (415) 326-4248**

OCTOBER 1976

CIRCLE NO. 7 ON INQUIRY CARD

INTERFACE AGE 11



**I bought an Apple II in the summer of 1977.**

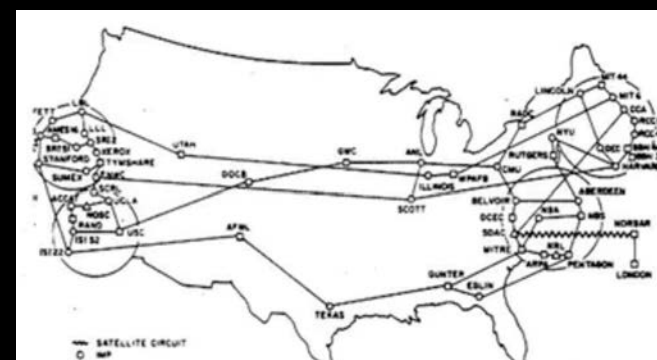






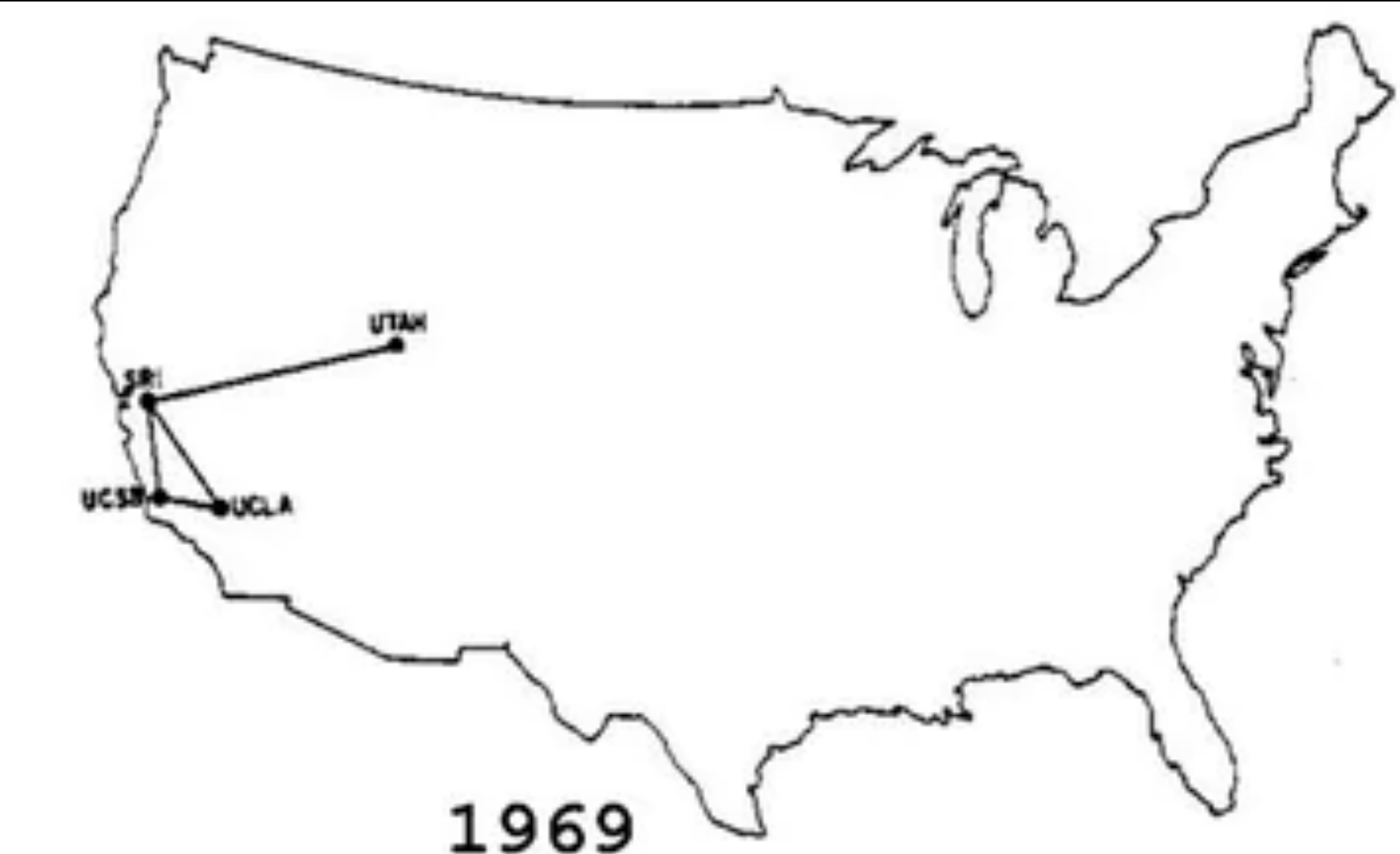


# Chapter 7: The Second Internet.

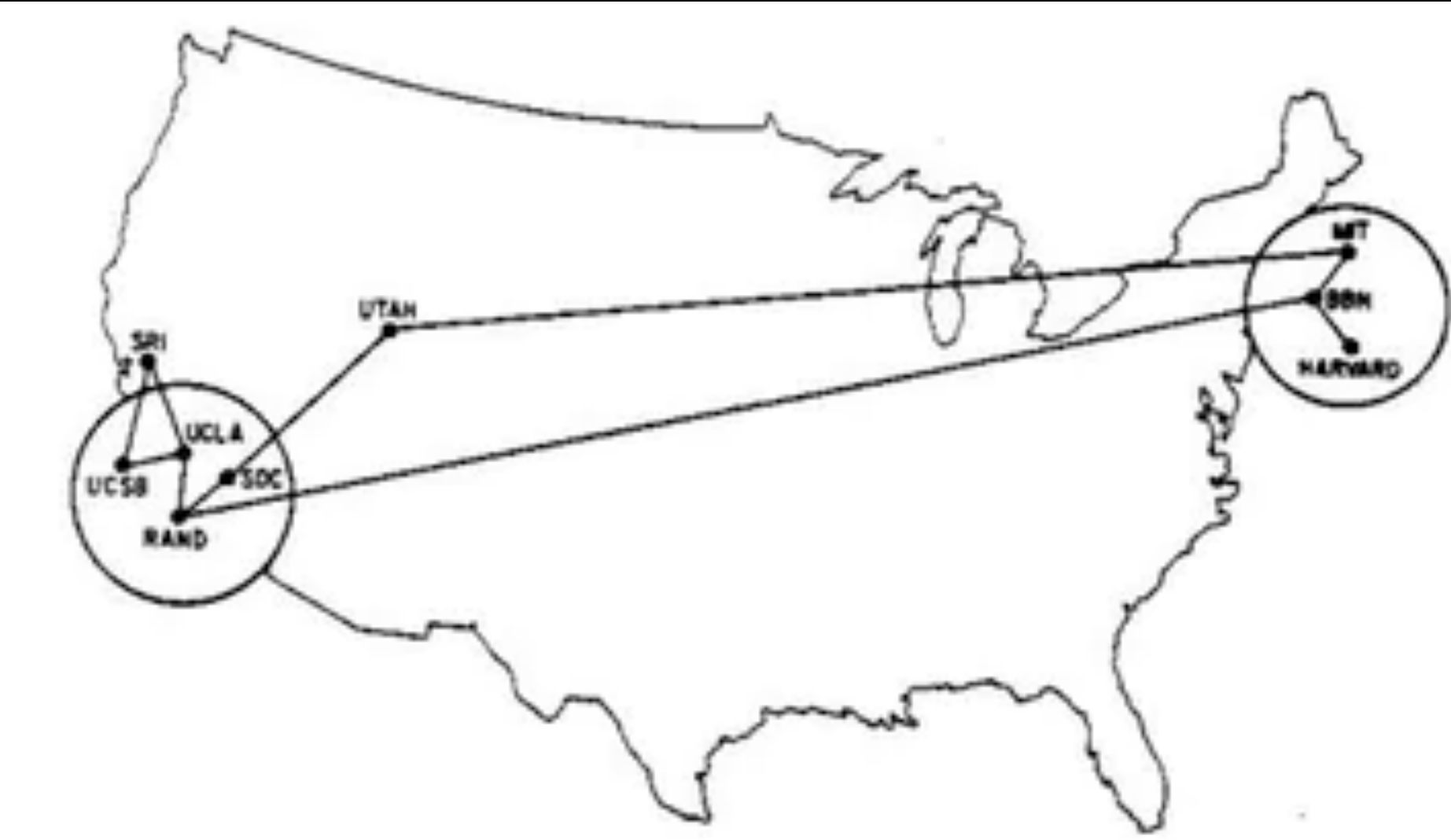




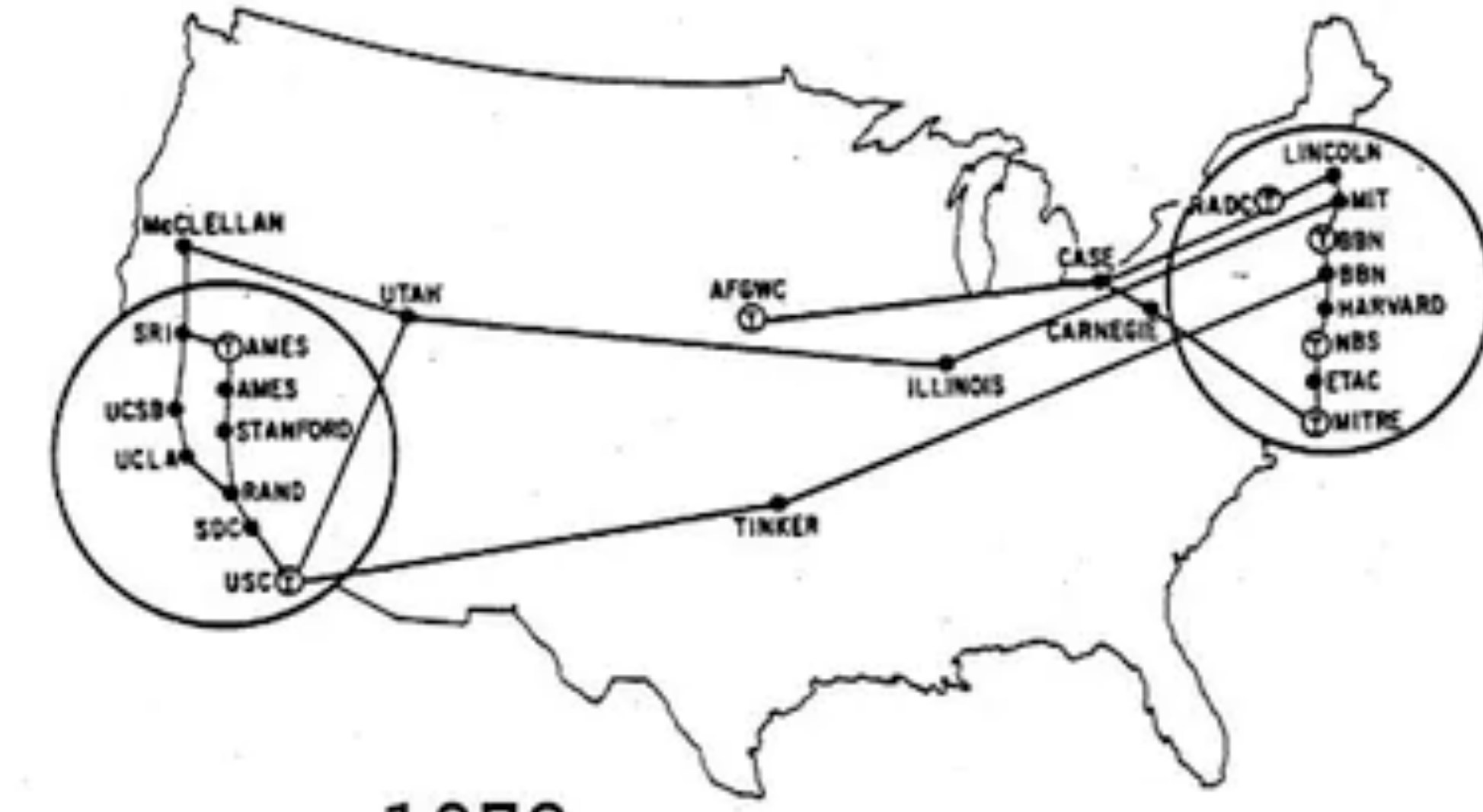
# ARPANET



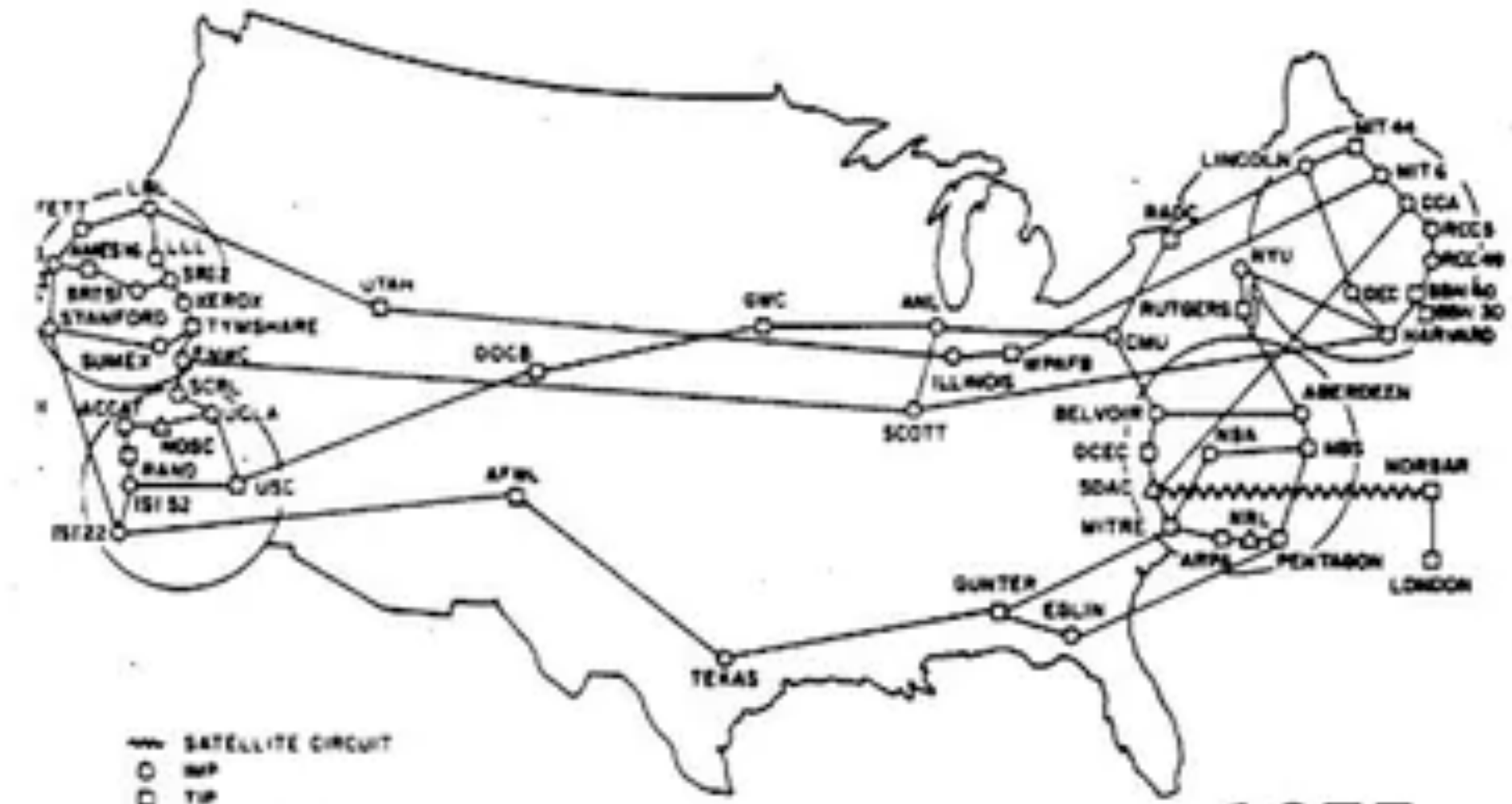
1969



1970



1972



1977

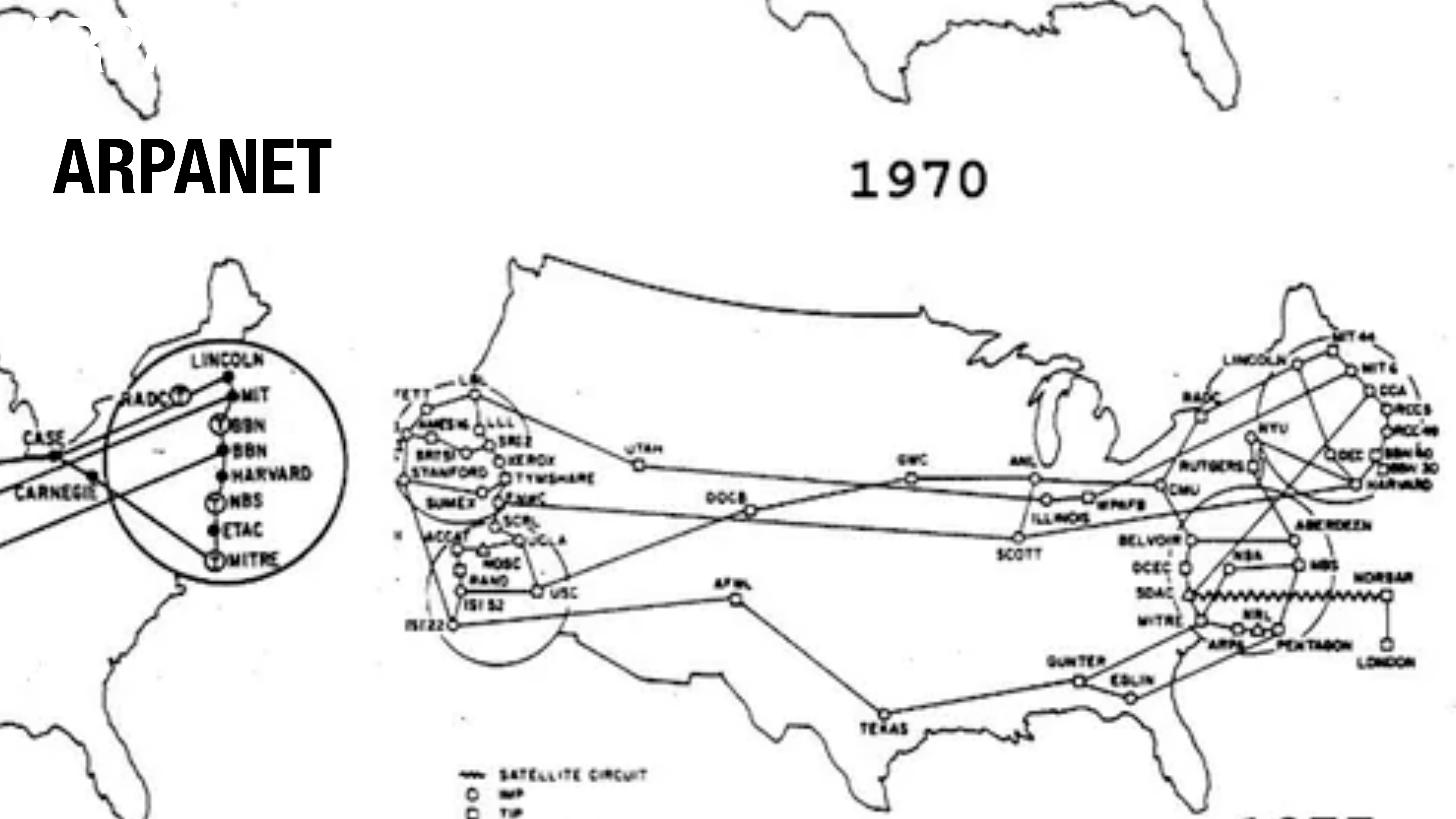
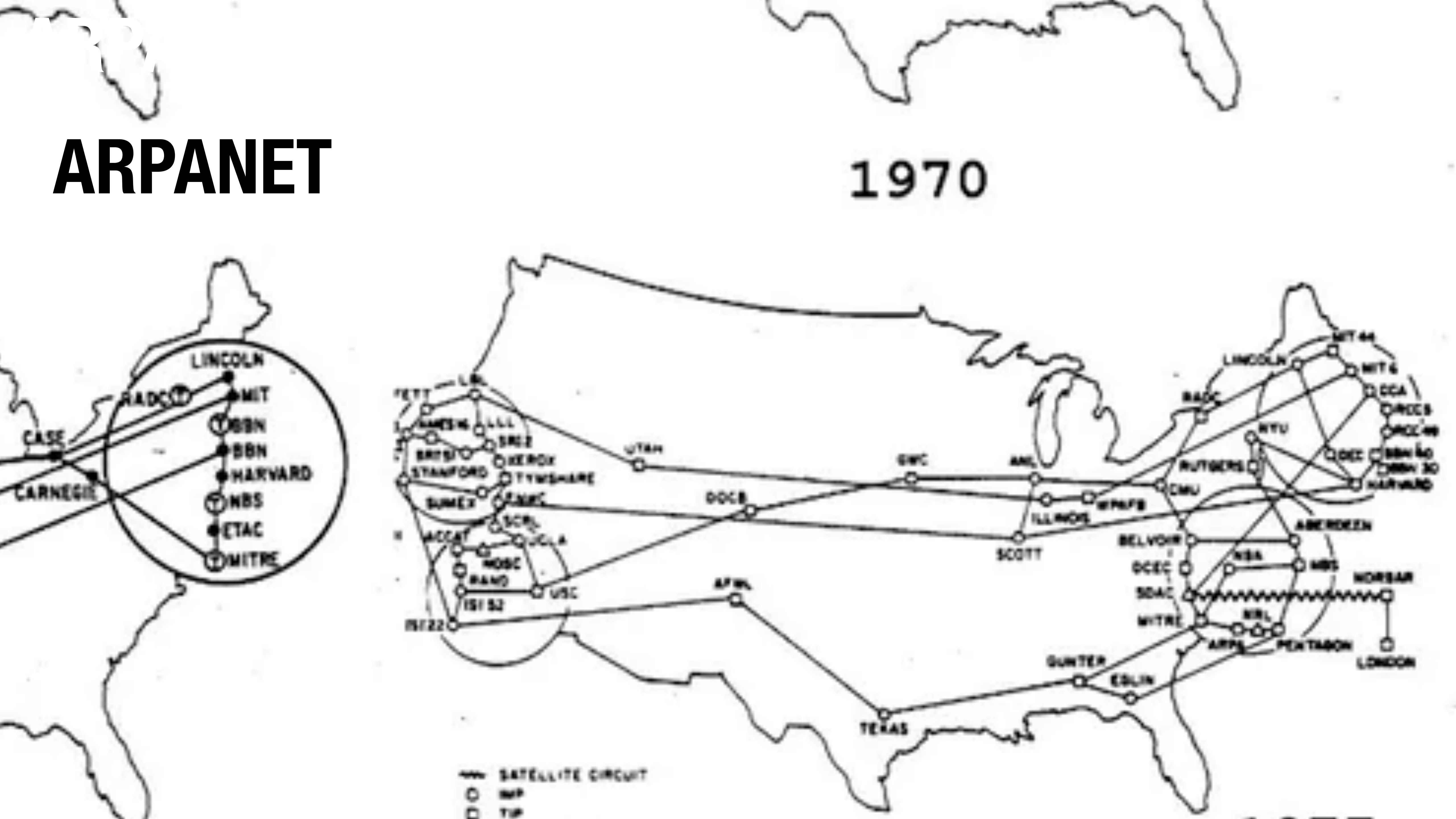


# ARPANET

1970

# ARPANET

1970





# ALPINE INN

*Formerly Rossotti's*

3915 ALPINE RD.

TELEPHONE TELEPHONE





## **BEGINNING OF THE INTERNET AGE**

On August 27, 1976, scientists from SRI International celebrated the successful completion of tests by sending an electronic message from a computer set up at a picnic table behind the Alpine Inn. The message was sent via a radio network to SRI and on through a second network, the ARPANET, to Boston. This event marked the beginning of the Internet Age.





```
address:      United States
phone:        +1 703 925-6999
fax-no:       +1 703 948 3978
e-mail:       info@verisign-grs.com

contact:      technical
name:         Registry Customer Service
organisation: VeriSign Global Registry Services
address:      12061 Bluemont Way
address:      Reston Virginia 20190
address:      United States
phone:        +1 703 925-6999
fax-no:       +1 703 948 3978
e-mail:       info@verisign-grs.com

nserver:      A.GTLD-SERVERS.NET 192.5.6.30 2001:503:a83e:0:0:0:2:30
nserver:      B.GTLD-SERVERS.NET 192.33.14.30 2001:503:231d:0:0:0:2:30
nserver:      C.GTLD-SERVERS.NET 192.26.92.30 2001:503:83eb:0:0:0:0:30
nserver:      D.GTLD-SERVERS.NET 192.31.80.30 2001:500:856e:0:0:0:0:30
nserver:      E.GTLD-SERVERS.NET 192.12.94.30 2001:502:1ca1:0:0:0:0:30
nserver:      F.GTLD-SERVERS.NET 192.35.51.30 2001:503:d414:0:0:0:0:30
nserver:      G.GTLD-SERVERS.NET 192.42.93.30 2001:503:eea3:0:0:0:0:30
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nserver:      J.GTLD-SERVERS.NET 192.48.79.30 2001:502:7094:0:0:0:0:30
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nserver:      M.GTLD-SERVERS.NET 192.55.83.30 2001:501:b1f9:0:0:0:0:30
ds-rdata:     30909 8 2 E2D3C916F6DEEAC73294E8268FB5885044A833FC5459588F4A9184CFC41A5766

whois:        whois.verisign-grs.com

status:       ACTIVE
remarks:      Registration information: http://www.verisigninc.com

created:      1985-01-01
changed:      2017-10-05
source:       IANA

# whois.verisign-grs.com

No match for domain "BREWATERS.COM".
>>> Last update of whois database: 2020-04-14T14:34:20Z <<<

macbook-pro-4:Documents bretwaters$
```



# 1991 FIRST WEB PAGE CREATED

## World Wide Web

The WorldWideWeb (W3) is a wide-area [hypermedia](#) information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an [executive summary](#) of the project, [Mailing lists](#), [Policy](#), November's [W3 news](#), [Frequently Asked Questions](#).

### [What's out there?](#)

Pointers to the world's online information, [subjects](#), [W3 servers](#), etc.

### [Help](#)

on the browser you are using

### [Software Products](#)

A list of W3 project components and their current state. (e.g. [Line Mode](#), X11 [Viola](#), [NeXTStep](#), [Servers](#), [Tools](#), [Mail robot](#), [Library](#))

### [Technical](#)

Details of protocols, formats, program internals etc

### [Bibliography](#)

Paper documentation on W3 and references.

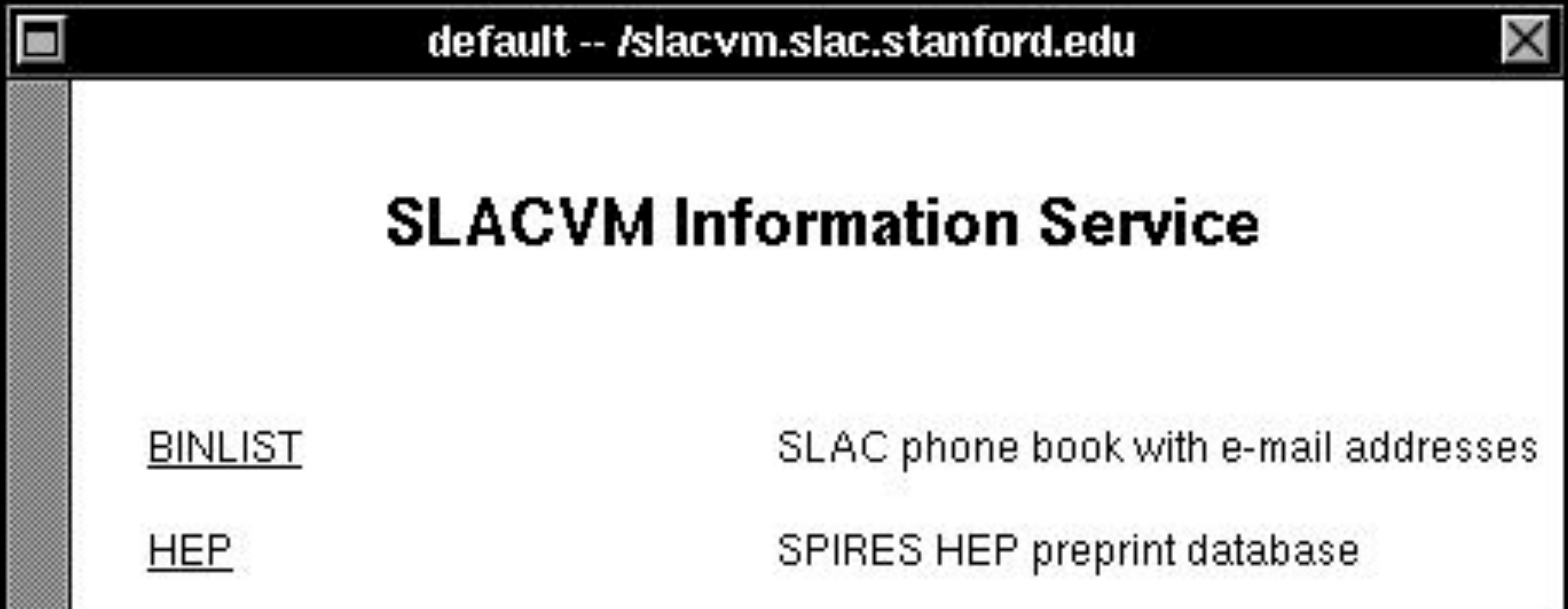
### [People](#)

A list of some people involved in the project.

### [History](#)



# First website in the US was at Stanford Linnear Accelerator Center





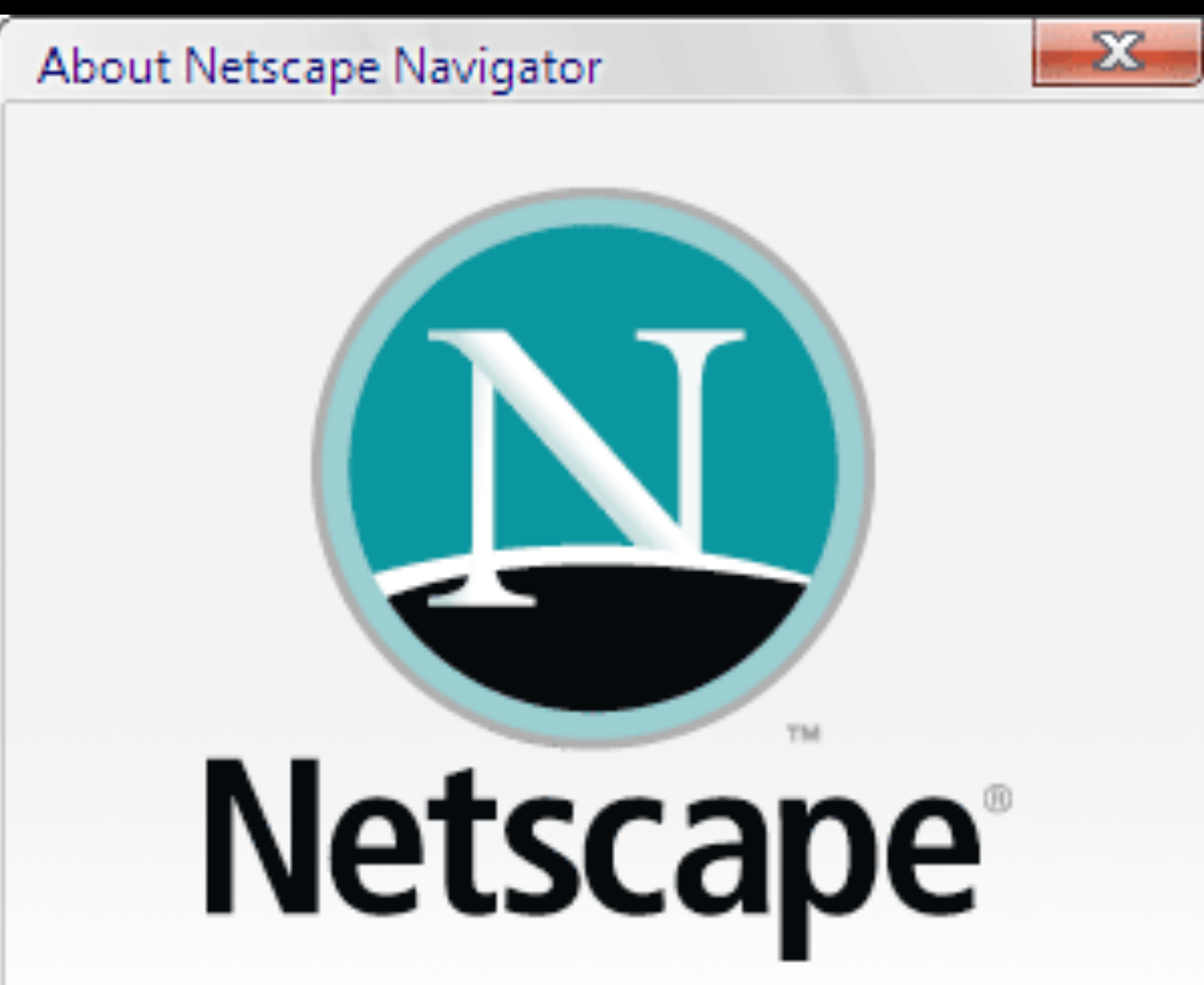


**Marc Andreessen**  
**Developer of Mosaic, 1993**





**Netscape had an IPO in 1995**  
**The stock more than doubled on the first day.**  
**\$2.9B in market cap on day one.**  
**The internet gold rush was on.**

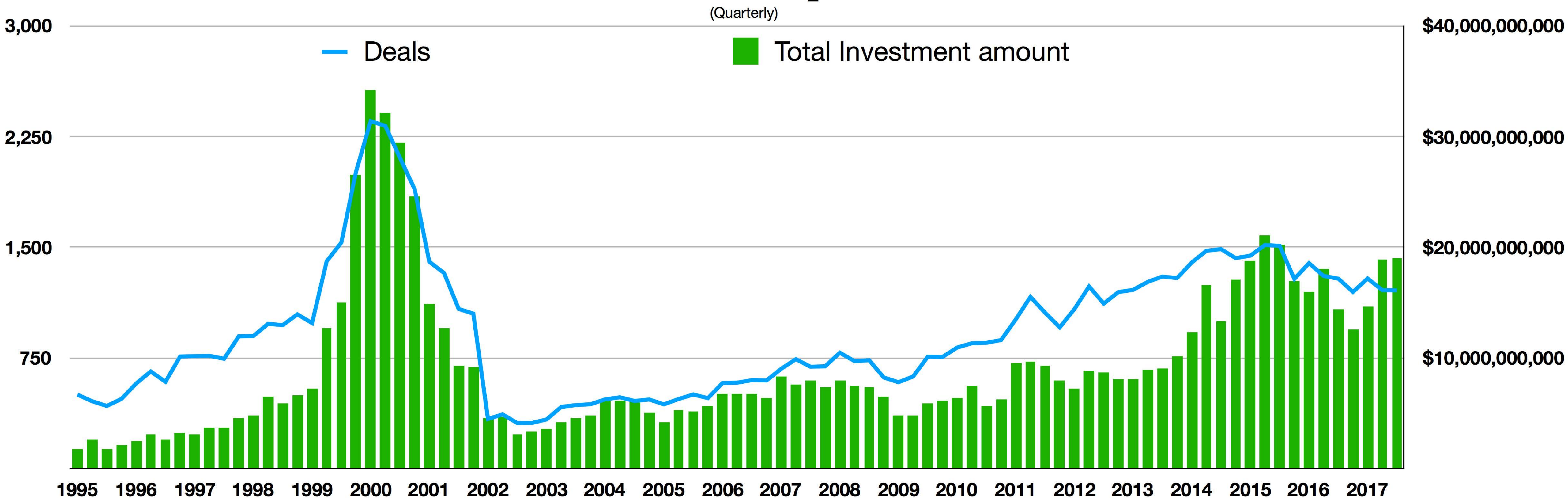


**Marc Andreessen**  
**Co-founder of Netscape, 1993**



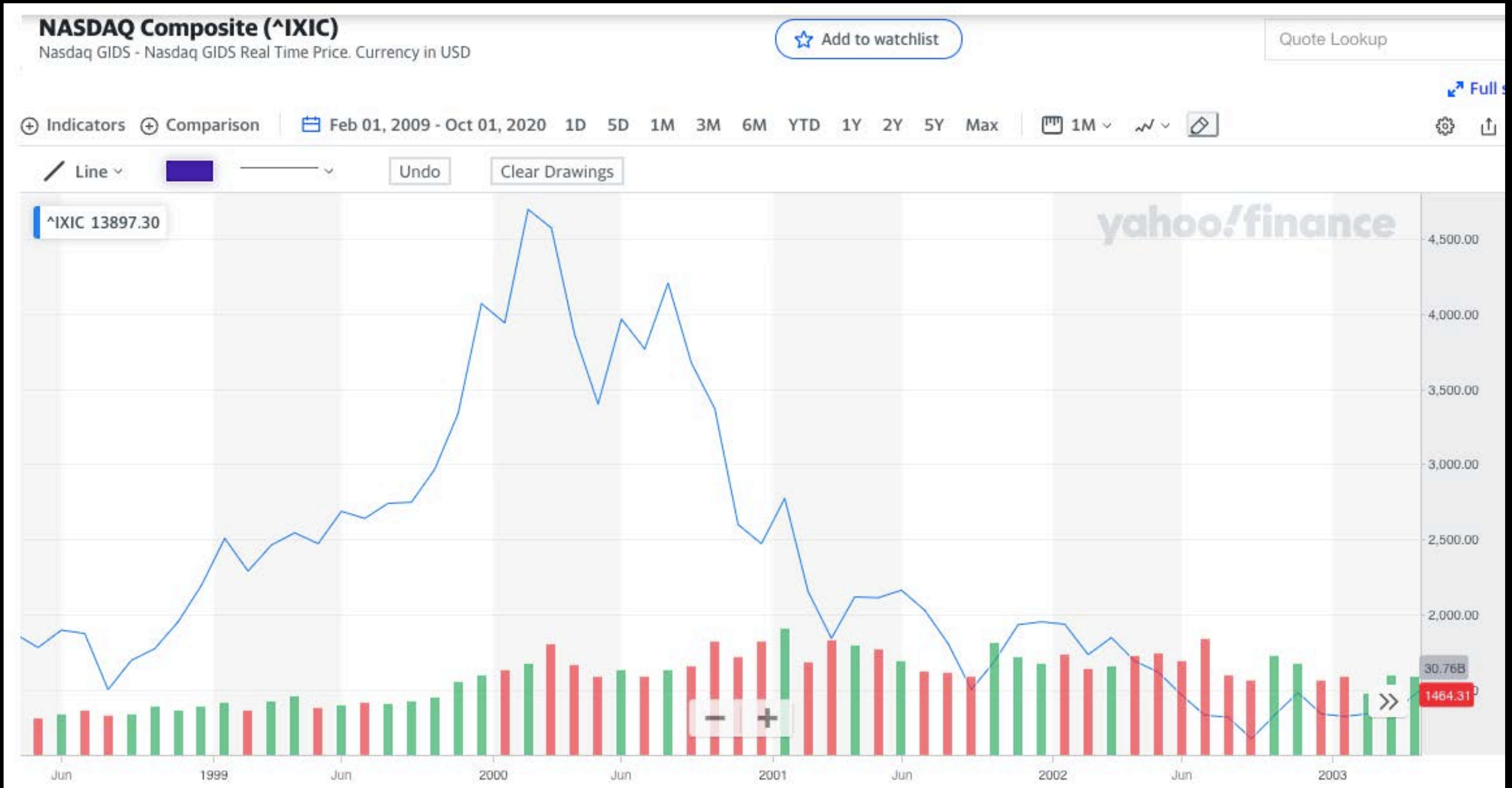
# The “dot com” boom and bust.

## Total U.S. Venture Capital Investments





# The “dot com” boom and bust.





**I know people who lost 90%  
of their net worth in 2000-2001.**



google.stanford.edu launches in 1996.



Search Stanford

10 results ▼ clustering on ▼ Search

10 results





# The servers for google.stanford.edu





**Eugene Kleiner**







**KLEINER PERKINS**

**Sand Hill Road**





# Google Receives \$25 Million in Equity Funding



## Sequoia Capital and Kleiner Perkins Lead Investment; General Partners Michael Moritz and John Doerr Join Board

**Palo Alto, Calif. – June 7, 1999** – Google, a start-up dedicated to providing the best search experience on the web, today announced it has completed a \$25 million round of equity funding led by Sequoia Capital and Kleiner Perkins Caufield & Byers.

Google also announced that Michael Moritz, general partner of Sequoia Capital, and John Doerr, general partner of Kleiner Perkins Caufield & Buyers, have joined its board of directors. Michael Moritz is currently a director of numerous companies, including Yahoo, eToys, Quote.com, eGroups, PlanetRx, Flextronics, and WebVan. John Doerr was a co-founder of @Home and is a director of several high growth internet companies, including Amazon.com, Drugstore.com, Handspring, Healtheon/WebMD, Homeshop.com, Intuit, and Sun Microsystems.

"We are delighted to have venture capitalists of this caliber help us build the company," said Larry Page, CEO and co-founder of Google.

"We plan to aggressively grow the company and the technology so we can continue to provide the best search experience on the web."

Google employs several key technologies to generate search results of unprecedented accuracy and quality. These technologies extend Stanford University research into large-scale data mining of the Web. "A perfect search engine will process and understand all the information in the world," said Sergey Brin, Google president and co-founder of Google. "That is where Google is headed."

Google's technology highlights include PageRank, a patent-pending, objective measure of the importance of web pages. PageRank is computed by solving an equation of 500 million variables and two billion terms. Google's innovative user interface includes dynamic summaries, a cached web, and the time-saving "I'm feeling lucky" button.

"Google should become the gold standard for search on the Internet," said Michael Moritz. "Larry and Sergey's company has the power to turn Internet users everywhere into devoted and life-long Googlers."

"Search is extremely challenging, and improvements in the technology are significant," said John Doerr. "One hundred million web searches are performed every day. Quickly finding the right information is critical for web users in many professions. Google revolutionizes search technology and delivers information in a way that focuses on the user."

**About Google**



## Google Receives \$25 Million in Equity Funding



**Sequoia Capital and Kleiner Perkins Lead Investment; General Partners Michael Moritz and John Doerr Join Board**

**Palo Alto, Calif. – June 7, 1999** – Google, a start-up dedicated to providing the best search experience on the web, today announced it has completed a \$25 million round of equity funding led by Sequoia Capital and Kleiner Perkins Caufield & Byers.

Google also announced that Michael Moritz, general partner of Sequoia Capital, and John Doerr, general partner of Kleiner Perkins Caufield & Buyers, have joined its board of directors. Michael Moritz is currently a director of numerous companies, including Yahoo, eToys, Quote.com, eGroups, PlanetRx, Flextronics, and WebVan. John Doerr was a co-founder of @Home and is a director of several high growth internet companies, including Amazon.com, Drugstore.com, Handspring, Healtheon/WebMD, Homeshop.com, Intuit, and Sun Microsystems.

"We are delighted to have venture capitalists of this caliber help us build the company," said Larry Page, CEO and co-founder of Google. "We plan to aggressively grow the company and the technology so we can continue to provide the best search experience on the web."

Google employs several key technologies to generate search results of unprecedented accuracy and quality. These technologies extend Stanford University research into large-scale data mining of the Web. "A perfect search engine will process and understand all the information in the world," said Sergey Brin, Google president and co-founder of Google. "That is where Google is headed."



**Raised \$25M from Kleiner in 1999.**  
**Had an IPO in 2004 with a market cap of \$23 billion.**







**Two years after founding, PayPal was acquired by eBay for \$1.5 billion.**

**The founders went on to found a slew of new companies.**



# **The PayPal Mafia**





**Peter Thiel**

**Elon Musk**





Jawed Karim and Chad Hurley founded **YouTube**  
Jeremy Stopelman and Russel Simmons founded **Yelp**.

David Sacks, founded **Yammer**

Peter Thiel, wrote check that launched **Facebook**.

Reid Hoffman, founded **LinkedIn**.

Max Levchin founded **Slide**, VP Eng at **Google**, founded **Affirm**.

Elon Musk, founded **SpaceX**, **Tesla**, **The Boring Co**.

**You Tube**

**facebook**

**yammer**

**yelp**

**affirm**

**TESLA**

**SPACEX**

**THE BORING  
COMPANY**

**Linked in**





165 University Avenue







165 University Avenue



**First  
Google  
Office**

**First  
PayPal  
Office**

**First  
Facebook  
Office**

165



TEA



**471 EMERSON**

**THE FACE BOOK**

Location of the "First Ever"  
Facebook Office.

Jan 10.2005 - July 30.2006

Leased under the tenant  
name "The Face Book"







# [ thefacebook ]

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Email:

Password:

[register](#)

[login](#)

## Welcome to Thefacebook!

### [ Welcome to Thefacebook ]

Thefacebook is an online directory that connects people through social networks at colleges.

We have opened up Thefacebook for popular consumption at **Harvard University**.

You can use Thefacebook to:

- Search for people at your school
- Find out who are in your classes
- Look up your friends' friends
- See a visualization of your social network

To get started, click below to register. If you have already registered, you can log in.

[Register](#) [Login](#)

[about](#) [contact](#) [faq](#) [terms](#) [privacy](#)

a Mark Zuckerberg production

Thefacebook © 2004



The Facebook logo, consisting of the word "facebook" in white lowercase letters on a blue rectangular background.

**Facebook has its IPO (public listing) in 2012, with a market capitalization of USD \$102 billion.**



**Instagram raised USD \$7 Million In 2011, was acquired in 2012 by Facebook for USD \$1 Billion**



**WhatsApp raised USD \$7 Million In 2010, was acquired in 2012 by Facebook for USD \$19 Billion**









**Today, this one valley continues  
to transform the world.**



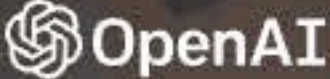
An aerial photograph of a valley at dusk. The foreground shows rolling green hills with some trees and a winding road. In the middle ground, a city is visible with its lights glowing against the twilight sky. The background features a range of mountains under a sky with soft orange and blue hues.

# Today, this one valley continues to transform the world.

A whole new generation of startup companies  
are developing AI, Machine Learning,  
Autonomous Vehicles, Gene Editing,  
Blockchain, Medical Devices, Deep Learning,  
New EV technologies, AgTech, and much more.



# The hottest company in Silicon Valley today is OpenAi and their new AI engine, ChatGPT.



API

RESEARCH

BLOG

ABOUT

Join us in shaping the future of technology.

▶ WATCH VIDEO

VIEW CAREERS >

+ New chat

New chat

Rhyme Word For Carry On

Rhyme of Marion

Limerick About Sequoia

New chat

Top Ten Songs 1976

Why Do Dogs Wag Tails

New chat

Clear conversations


Dark mode

OpenAI Discord

Updates & FAQ

Log out

ChatGPT




Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →




Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



Limitations

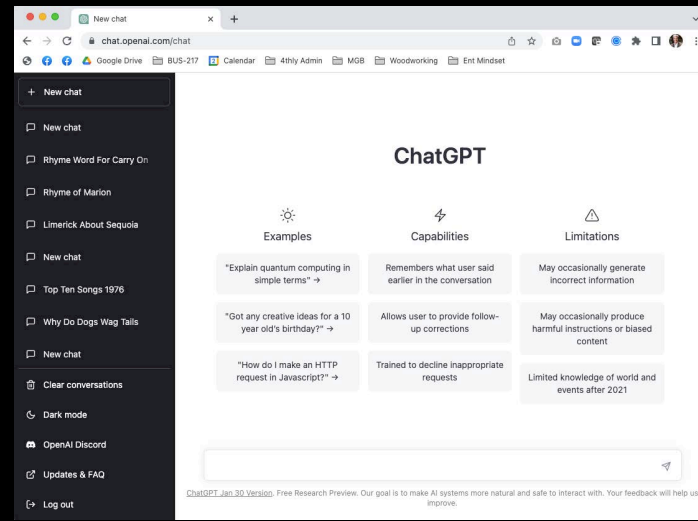
May occasionally generate incorrect information

May occasionally produce harmful instructions or biased content

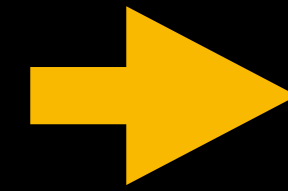
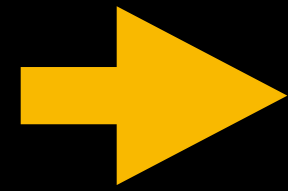
Limited knowledge of world and events after 2021

ChatGPT Jan 30 Version. Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help us improve.





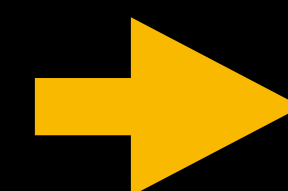
**ChatGPT  
Open AI**



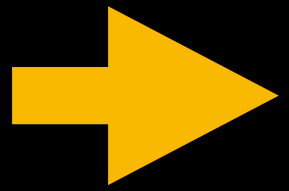
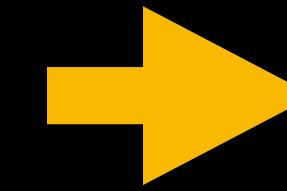
**President and Co-Founder  
Greg Brockman**



**Greg Brockman is  
former CTO of Stripe.  
(Worth \$60B)**



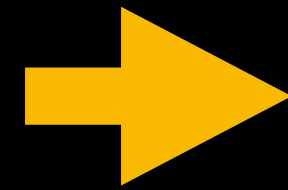
**Stripe was funded by  
Sequoia Capital.**



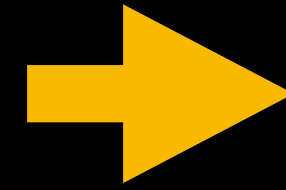
**Sequoia Capital was the VC  
firm that funded Apple,.**



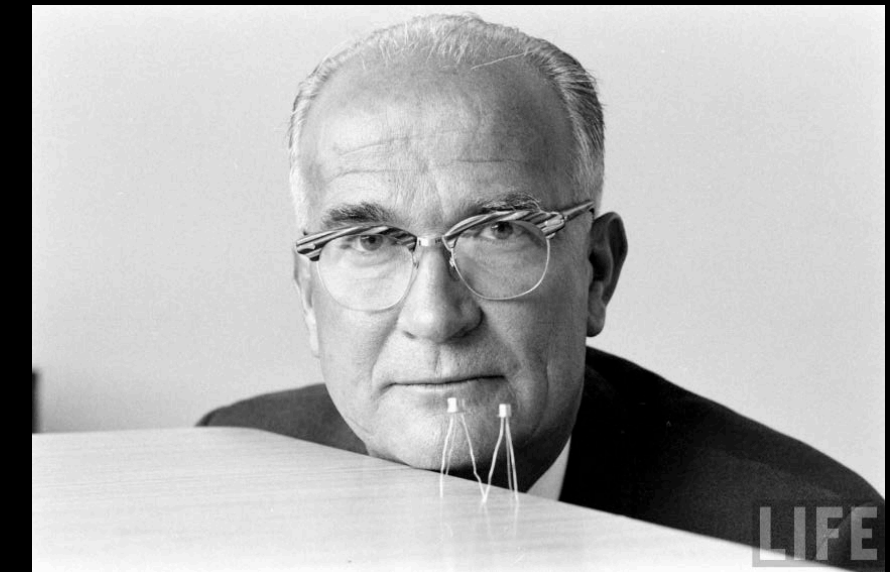
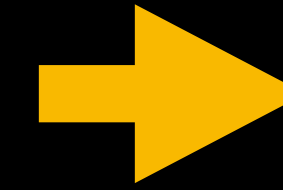
**Sequoia Capital was  
founded by Don Valentine.**



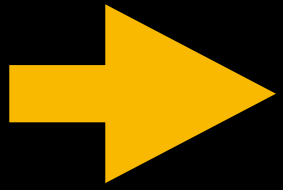
**Don Valentine was  
sales manager at Fairchild.**



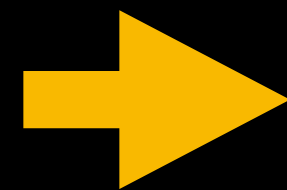
**Fairchild was founded  
by the traitorous eight.**



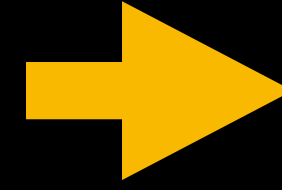
**They quit their jobs at  
Shockley Semiconductor**



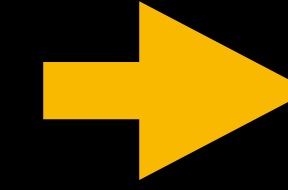
**Victor Grinich was  
one of the Traitorous  
Eight.**



**Victor Grinich got his PhD  
at Stanford University,  
under Fred Turman**



**The university was founded  
by Leland Stanford.**



**Leland Stanford was a 49er.**



An aerial photograph of a valley at dusk. The foreground shows rolling green hills with some trees and a winding road. In the middle ground, a city is visible with its lights glowing against the twilight sky. The background features a range of mountains under a sky with soft orange and blue hues.

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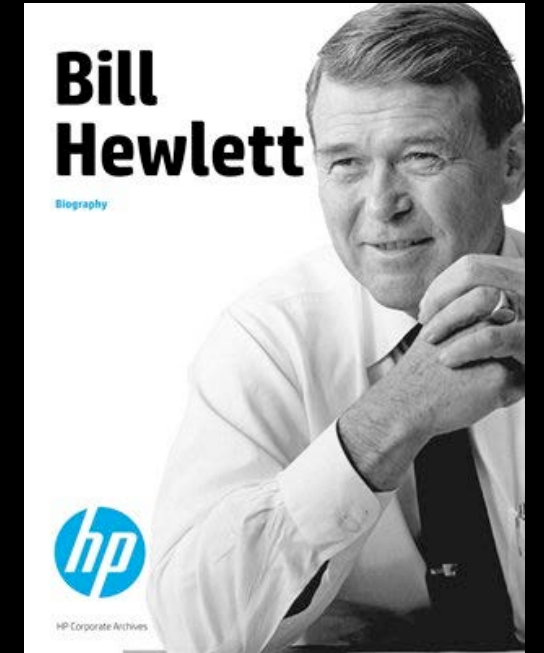
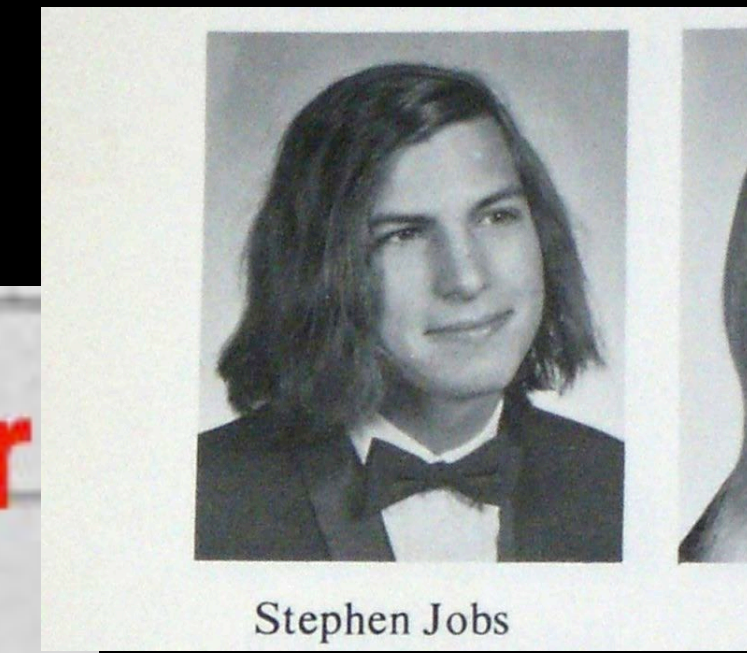
A whole new generation of startup companies  
are developing AI, Machine Learning,  
Autonomous Vehicles, Gene Editing,  
Blockchain, Medical Devices, Deep Learning,  
New EV technologies, AgTech, and much more.







# A culture of reinvestment.







**Stanford University**



# **Welcome to Silicon Valley.**

**bretw@stanford.edu**