

Silicon Valley



What is Silicon Valley ?



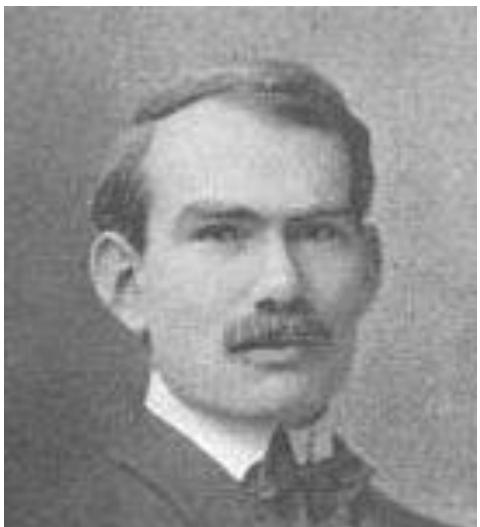
Silicon Valley is an **economic cluster**.

A network of networks, rich in financial and social capital spanning every area of technology, all focused on developing and **commercializing** new technologies.

SV is therefore the center of technical innovation of the US and of the world.



History matters !



What is called today the Bay of San Francisco was accidentally discovered in 1769 by the Spanish soldier and explorer Gaspar de Portolà



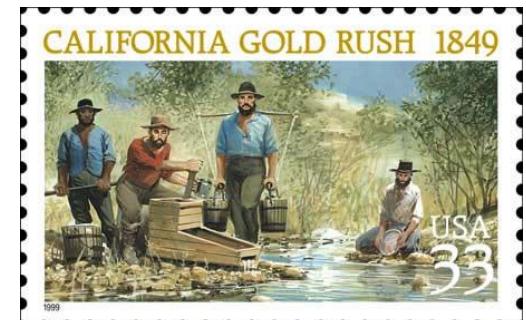
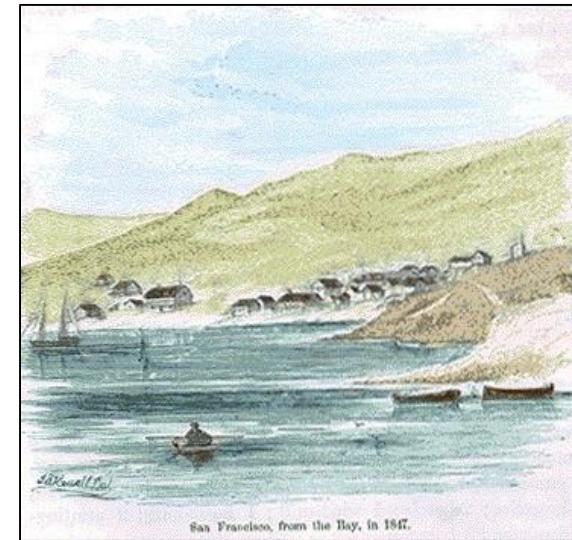
How many inhabitants were there in San Francisco in the year 1846 ?

200

100 Ohlone Indians + 100 Mexicans

San Francisco grew from such small settlement to a boomtown of about 36,000 by 1852.

Why ? What had happened ?





The Berkeley campus of the University of California opened in 1883.



Stanford University opened in 1891.



The Silicon Valley system stands on six cornerstones



30 “Fortune-500” companies of Silicon Valley

- Adobe
- AMD
- Agilent
- Apple
- Applied Materials
- Brocade
- Cisco
- eBay
- Facebook
- Google
- Hewlett-Packard
- Intel
- Intuit
- Juniper Networks
- KLA Tencor
- LSI Logic
- Marvell
- Maxim
- National Semicond.
- NetApp
- Netflix
- Nvidia
- Oracle
- Salesforce
- SanDisk
- Sanmina
- Symantec
- Western Dig.
- Xilinx
- Yahoo!

100 Silicon Valley stars

3Com	IBM	Quantcast
A10 Networks	IDEO	Quora
Actel	Informatica	Rambus
Actuate Corporation	Intuitive Surgical	Riverbed Technology
Adaptec	Kerio Technologies	ROBLOX
Aeria Games	LinkedIn	RSA
Akamai Technologies	Logitech	Redback Networks
Altera	LynuxWorks	Samsung
Amazon	Maxtor	SAP
Amdahl	McAfee	Siemens
Ampex	Memorex	Silicon Graphics
Antibody Solutions	Micron Technology	Silicon Image
Aricent	Microsoft	Solectron
Asus	Mozilla Foundation	Solstice
Atari	Move Inc	Sony
Atmel	Nokia	SRI International
Broadcom	Netscape	SunPower
BEA Systems	NeXT Computer	Synopsys Inc.
Business Objects	Ning	Tata Consultancy Services
Chegg	NXP Semiconductors	Tibco Software
Cypress Semiconductor	Nook	Tesla
Dell	Olivetti	TWiT
Electronic Arts	Opera Software	Tellme Networks
EMC Corporation	OPPO	TiVo
Extreme Networks	Palm	Twitter
E*TRADE	PalmSource	VA Software
Fairchild Semiconductor	Panasonic	VeriSign
Force10	PayPal	VMware
Foundry Networks	Philips	Vocera
Fujitsu	PlayPhone	WebEx
Groupon	Qualcomm	YouTube
Hitachi	Quanta Computer	Yelp

How many Universities and Colleges are there in SV ?

34

1. The Art Institute of California
2. California College of the Arts
3. Carnegie Mellon University
4. California State University
5. Chabot College
6. Cogswell Polytechnical College
7. De Anza College
8. Evergreen Valley College
9. Foothill College
10. Golden Gate University
11. Hult International Business School
12. John F. Kennedy University Campbell
13. Lincoln Law School of San Jose
14. Menlo College
15. Mission College
16. Northwestern Polytechnic University
17. National Hispanic University
18. Notre Dame de Namur University
19. Ohlone College
20. Peralta Colleges
21. Saint Mary's College of California
22. San Jose City College
23. San José State University
24. San Francisco State University
25. Santa Clara University
26. Silicon Valley University
27. Stanford University
28. University of California, Berkeley
29. University of California, Davis
30. University of California, Santa Cruz
31. University of Phoenix San Jose Campus
32. University of San Francisco South Bay
33. University of Silicon Valley Law School
34. West Valley College

How old is Silicon Valley as an economic cluster in technology ?

100 years

Between 1911 and 1913, at the corner of Emerson and Channing in downtown Palo Alto, Lee De Forest, the Father of Electronics, developed the triode amplifier (vacuum tube) at Federal Telegraph.



The problem to solve was ship-to-coast-to-ship communication.

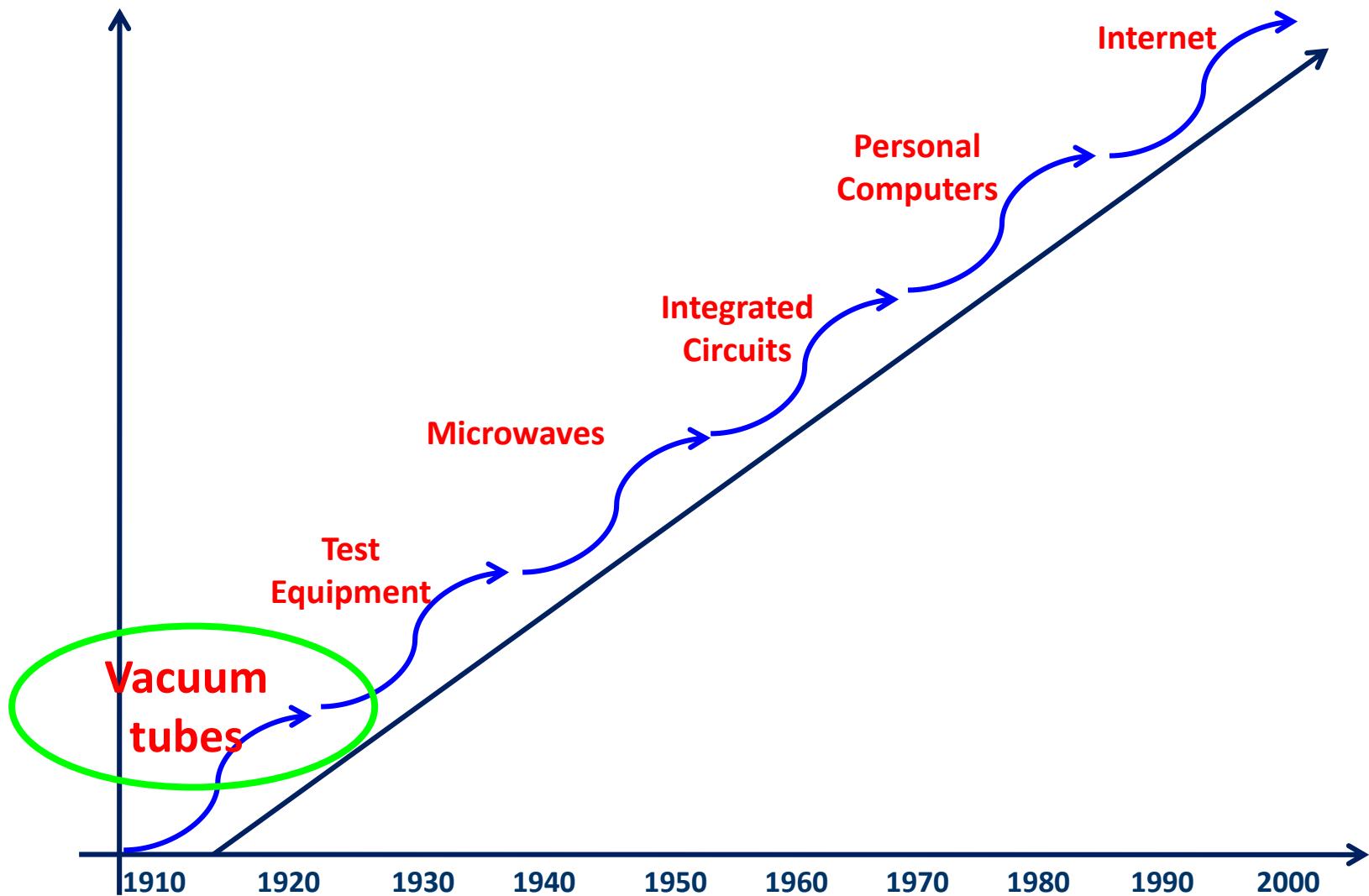


Vacuum tubes made cheap, powerful radios possible.

The Bay Area then developed an early lead in radio technology.

Radio technology eventually snowballed into radar, television, electronics, computers, modern software, and eventually the Internet.

the SV path of innovation

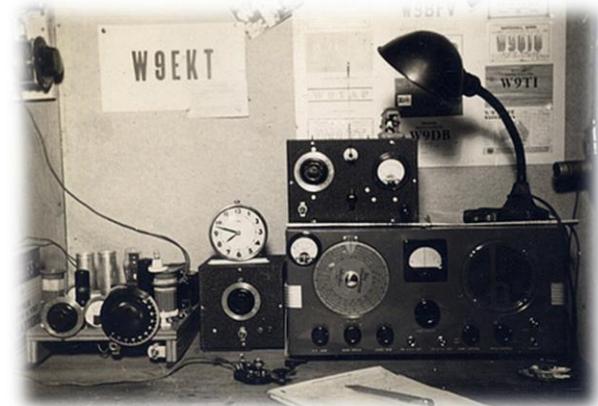


The descendants of gold miners and pioneers, Californians were always **early adopters and innovators**.

Radio companies began appearing in San Francisco soon after that first transmission, and they sound much like the social networks of today: **risky investment in new mediums of communication**.

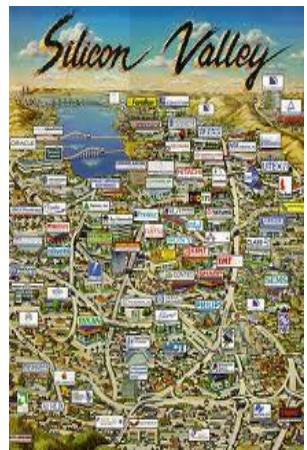
One such radio company was funded by a public offering of stock by its founder Charles Litton, a 10 year old prodigy.

A culture of collaboration among radio companies developed. That same culture characterizes the valley today: **intensely competitive and collaborative**.





In history, the closest comparison to the Silicon Valley phenomenon was the cultural and artistic Renaissance in Florence, spanning the 14th to 17th Century.



The most determined and most talented engineers, researchers and entrepreneurs have flocked to the Valley from every corner of the world for **more than a century** to build **thousands of companies** that pioneered many of the technologies that underpin global civilization.

Leland Stanford

In the late 19th century Leland Stanford lived in Wisconsin and he moved to California during the Gold Rush, where he became an extraordinarily rich man.

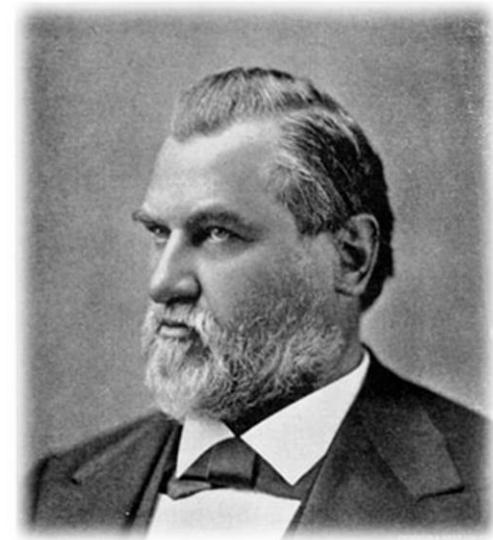
By digging more gold than anyone else ?

No, by selling shovels to the gold-rushers !

Stanford was the keeper of a general hardware store for miners that grew in a wholesale house and then into a fortune.

Stanford became a full-blown tycoon - California Governor, US Senator - his interests came to include Wells Fargo, Union Pacific, and the Occidental and Oriental Steamship Company.

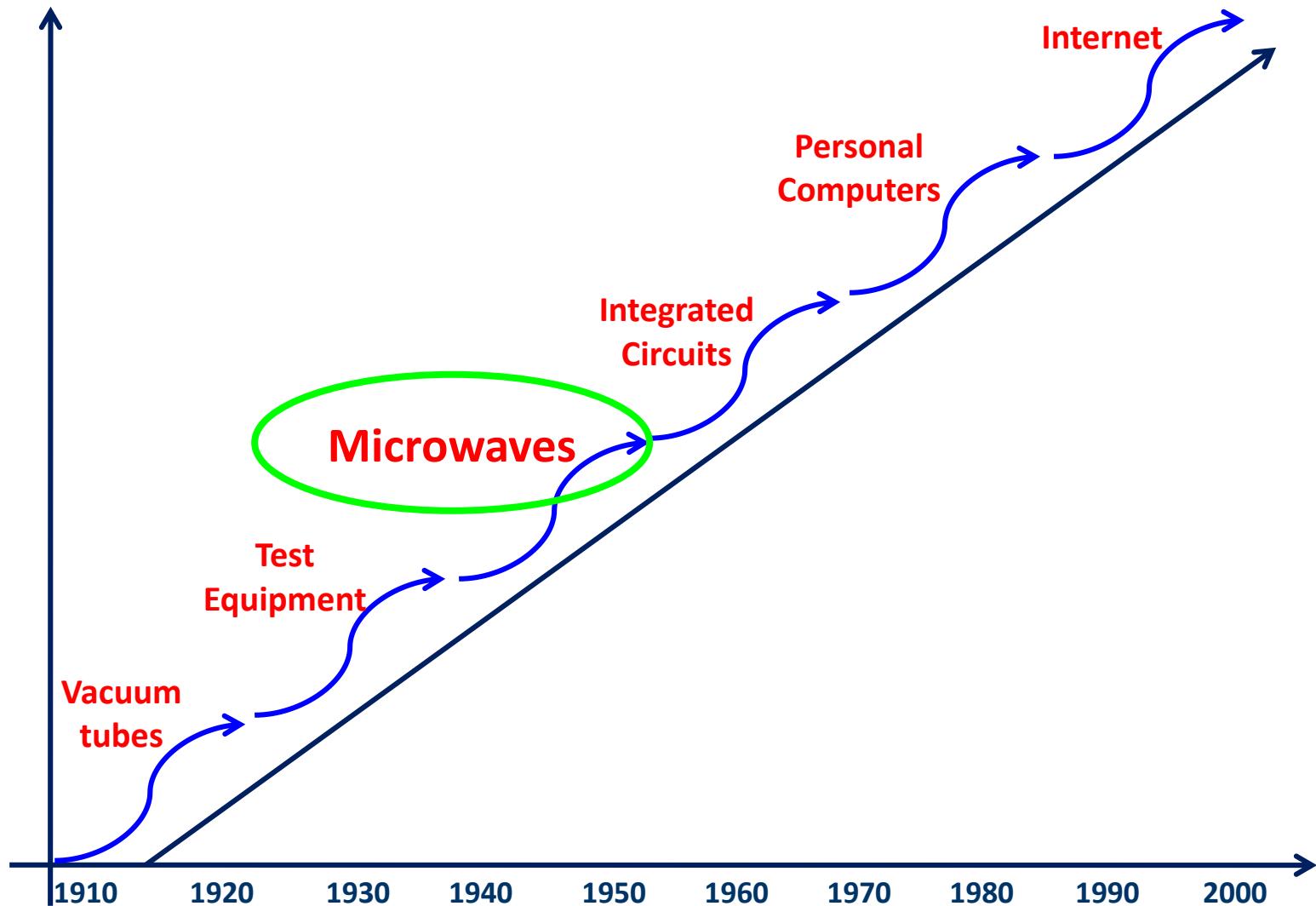
Needless to say, he founded **Stanford University**, on the site of his 650 acre farm just outside Palo Alto.



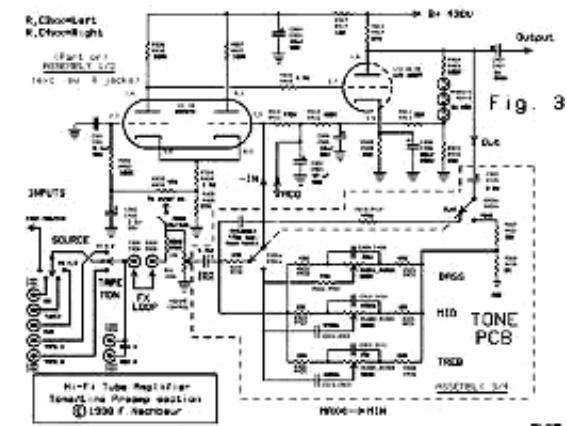
- There would not exist a Silicon Valley without Stanford
- Stanford pioneered University to Industry relations during the time when most engineering departments, especially elite ones like MIT and the Eng. Schools in Europe would fire Professors and graduate researchers for having extracurricular interests in industries



the SV path of innovation



- Frederick Terman was born in 1900 and earned a Sc.D. in electrical engineering at MIT in 1924.
- He wrote the fundamental text-book of Radio Engineering
- In the late 1920s, Terman was Professor of Electric Engineering at Stanford and he designed a course of study and research in electronics that focused on work with vacuum tubes, circuits, and instrumentation.





- How many commercial jet airplanes are there in the world today (Boeing, Airbus etc.)? 20,000
- Now, do you know how many Allied bomber airplanes were there in England in 1944 ? **28,000**
- That was called the “Combined Bomber Offensive” of the British and the Americans against Germany



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- Why that many ?

Because 6 to 20 out of 100 did not make it back from each bombing mission

- 
- ... and why was that ?

Because the Germans had lots of good radars driving the anti-aircraft artillery batteries.



Germany had build and integrated electronic air defense network to detect, aim and destroy the allied bombers.



- During World War II, the Department of Defense called Fred Terman to build and direct a staff of 850+ people at the secret Radio Research Laboratory at Harvard University.

- This organization was the center of all **Electronic Warfare** during WWII. It originated all of the allied jammers to block enemy radar, tunable receivers to detect radar signals, and aluminum strips ("chaff") to produce spurious reflections on enemy radar receivers. These countermeasures significantly reduced the effectiveness of radar-directed anti-aircraft fire.

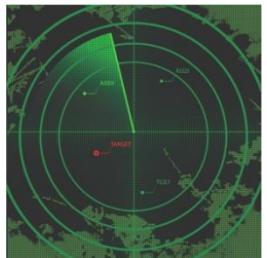




- After the war Terman returned to Stanford and was appointed dean of the School of Engineering.
- In 1951 he spearheaded the creation of Stanford Industrial Park (now Stanford Research Park), whereby the University leased portions of its land to high-tech firms.
- Companies such as Varian Associates, Eastman Kodak, General Electric, and Lockheed Corporation moved into Stanford Industrial Park and made the mid-Peninsula area into a hotbed of innovation which eventually became known as Silicon Valley.

- Fred Terman is then essentially the father of Silicon Valley together with William Shockley.
- He was the kind of Professor who encouraged Bill Hewlett and David Packard to start their company and he personally invested in it.





- In the 1950s Terman basically moved the electronic/microwaves Lab from MIT to Stanford and continued working on electronic countermeasures and electronic intelligence (ELINT).
- Stanford became center of excellence for the CIA, NSA, Navy, Air Force etc.
- Billions of dollars of federal/defense money entered the local economy through federal research and military contracts
- The engineering department developed a secret weapons “Terman-lab” with 400 scientists and technicians.



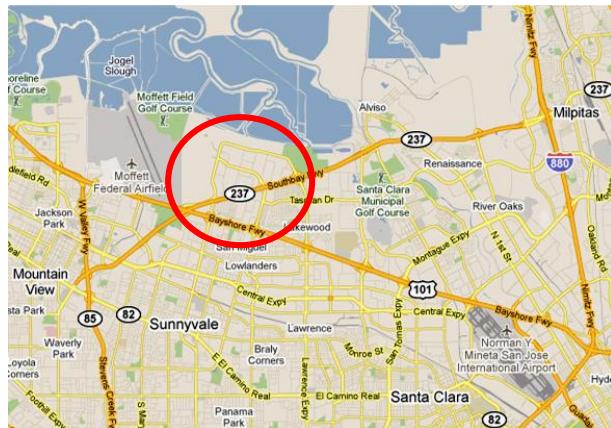


- By the end of the '50s three quarters of all the PhD thesis were classified **military projects**.
- The Terman-lab then encouraged graduate students to **start companies** and commercialize the result of their researches
- It also encouraged Professors to consult for companies, started **technology transfer & IP licensing**.
- The **Silicon Valley** as we know it started here, in terms of an entrepreneurship system.

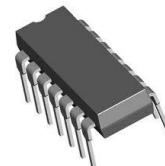
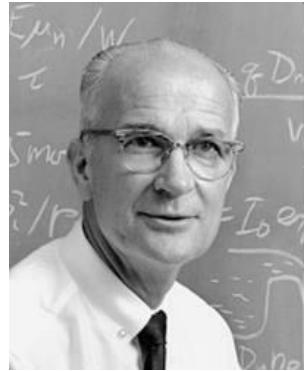




- In 1956 Lockheed, the aircraft manufacturer from Southern California, won a defense contract to build the submarine ballistic missiles Polaris.
- Lockheed then started a division in Sunnyvale that reached 20,000 employees in 4 years where also some other spy satellites were developed and built.

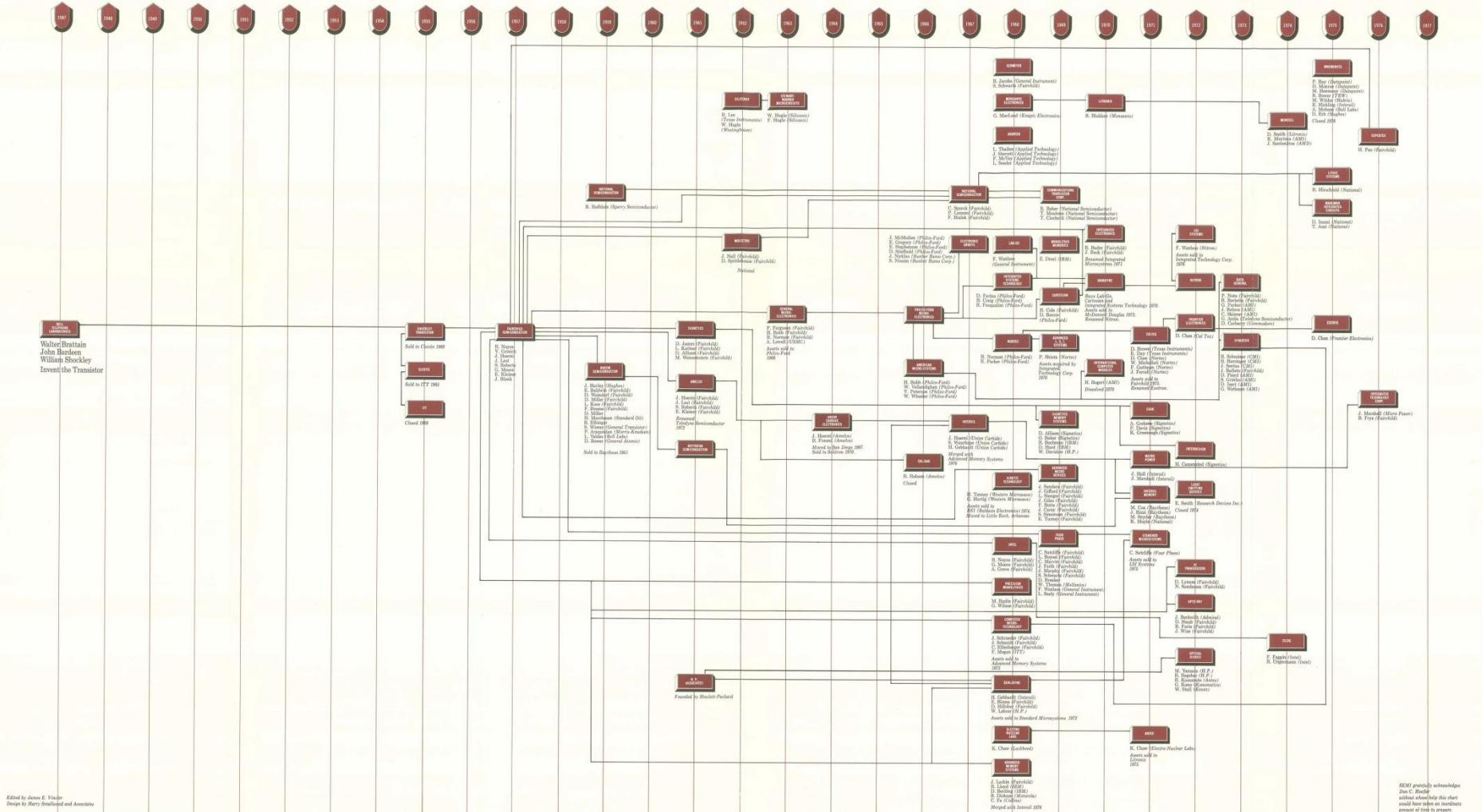


- Again in 1956, William Shockley, the former director of radar bombing team for Air Force co-invented the **transistor**, won the Nobel prize and started a company, Shockley Semiconductor .
- Shockley was a great scientist and a terrible employer/manager so eight of his best employees left Shockley's company to found **Fairchild Semiconductor**, the first VC-backed start-up.
- Gordon Moore and Robert Noyce then left Fairchild to found another start-up called **Intel**.
- Within the next 20 years, 65 semiconductors companies were started.

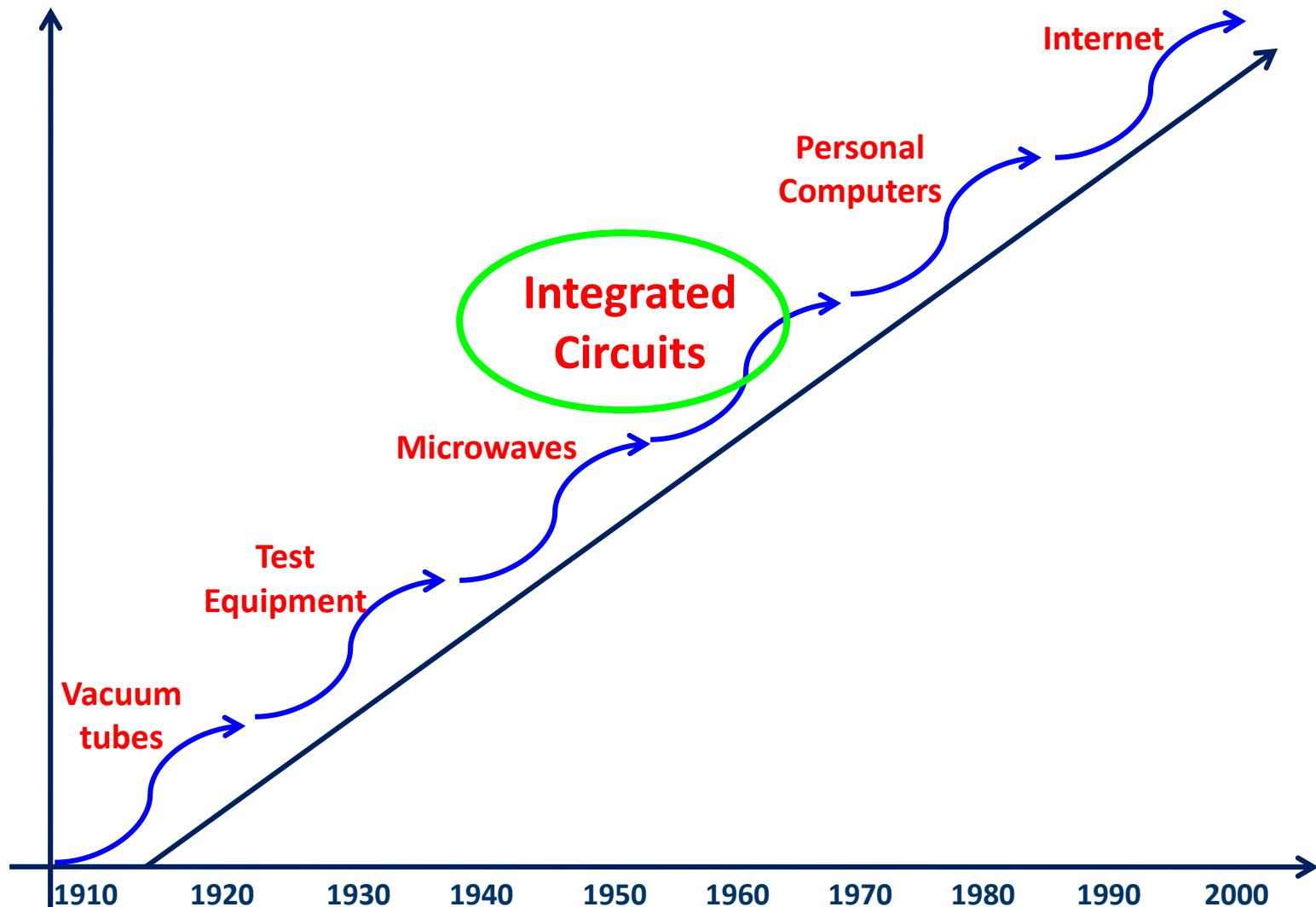


SV semiconductor genealogy

SILICON VALLEY GENEALOGY



the SV path of innovation



- Silicon Valley is not just about technology and entrepreneurship
- The indispensable partners of SV entrepreneurs and innovators are **venture capitalists**, essentially financial people (who are equally crazy).

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- Venture capital (VC) is financial capital provided to early-stage, high-potential, high risk, growth startup companies. The venture capital fund makes money by owning equity in the companies it invests in, which usually have a novel technology or business model in high technology industries.

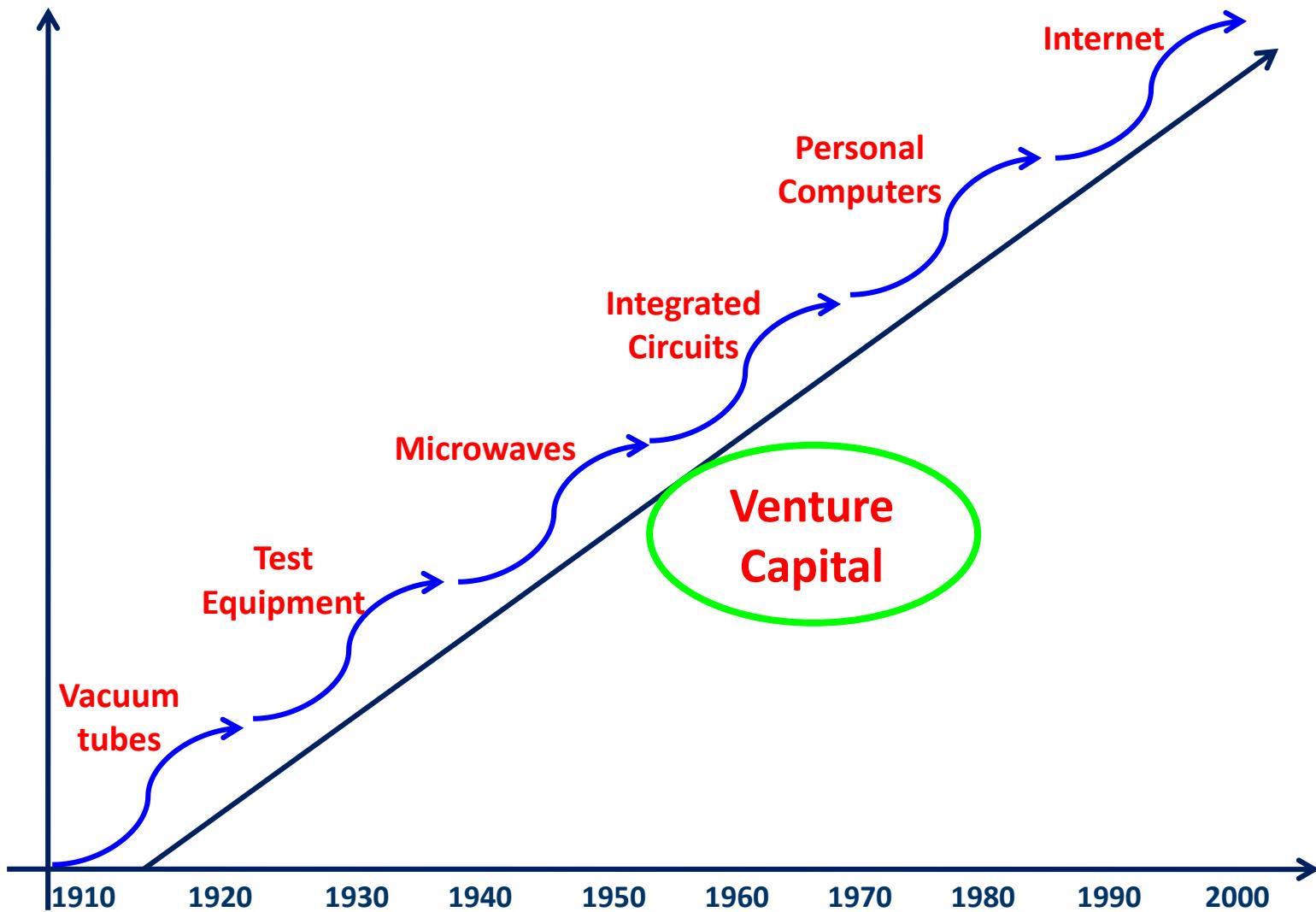


- Until the early '60s there was no notion of VC in the USA. If one wanted to start a company either he needed to get customers or to go to a bank for a loan.
- The VC industry originated from “Limited Partnerships”. Those companies raise money from pension funds, private organizations, wealthy individuals, - the **limited partners**
- Investment professionals manage the fund – the **general partners** i.e., the VC's compensated with the “2 & 20” rule (2% management fee + 20% carried interest i.e., of the profits)
 - Draper Gaither & Anderson 1958
 - Rock and Davis 1961
 - Sutter Hill 1964
 - Kleiner Perkins 1972
 - Sequoia Capital 1972

- From 1995 to 2000 Venture Capital backed Internet companies went from 0 to \$ 400 B (in just 5 years !)
- In the same time Kleiner Perkins invested \$ 1.3B in 250 tech startups resulting in 192,000 jobs and \$ 73B in sales (average investment \$ 5.3M, average sales achieved \$ 292 M).



the SV path of innovation



SV's engines of entrepreneurship

1st engine

entrepreneurs

Military
finance



1946 – 1968

- * Funding for companies was military finance
- * Motivated by crisis /defense

2nd engine

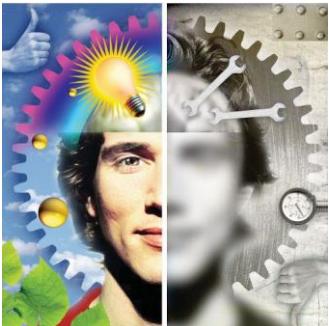
entrepreneurs

Venture
finance



1960 – xxxx

- * Motivated by profit
- * Boomed after 1978 because of “Capital Gain Bill” and “Retirement Security Act”



Silicon Valley has an established strong tradition and unique mechanism in place for:

- innovation & new technologies development from excellence research centers and Universities
- a pervasive culture of entrepreneurship
- innovation transfer and commercialization through unique infrastructures such as the VC parks and angel community, experienced corporate and IP law firms, tech-savvy entrepreneurs with an inherent culture of risk taking, highly skilled work-force and management, etc.,

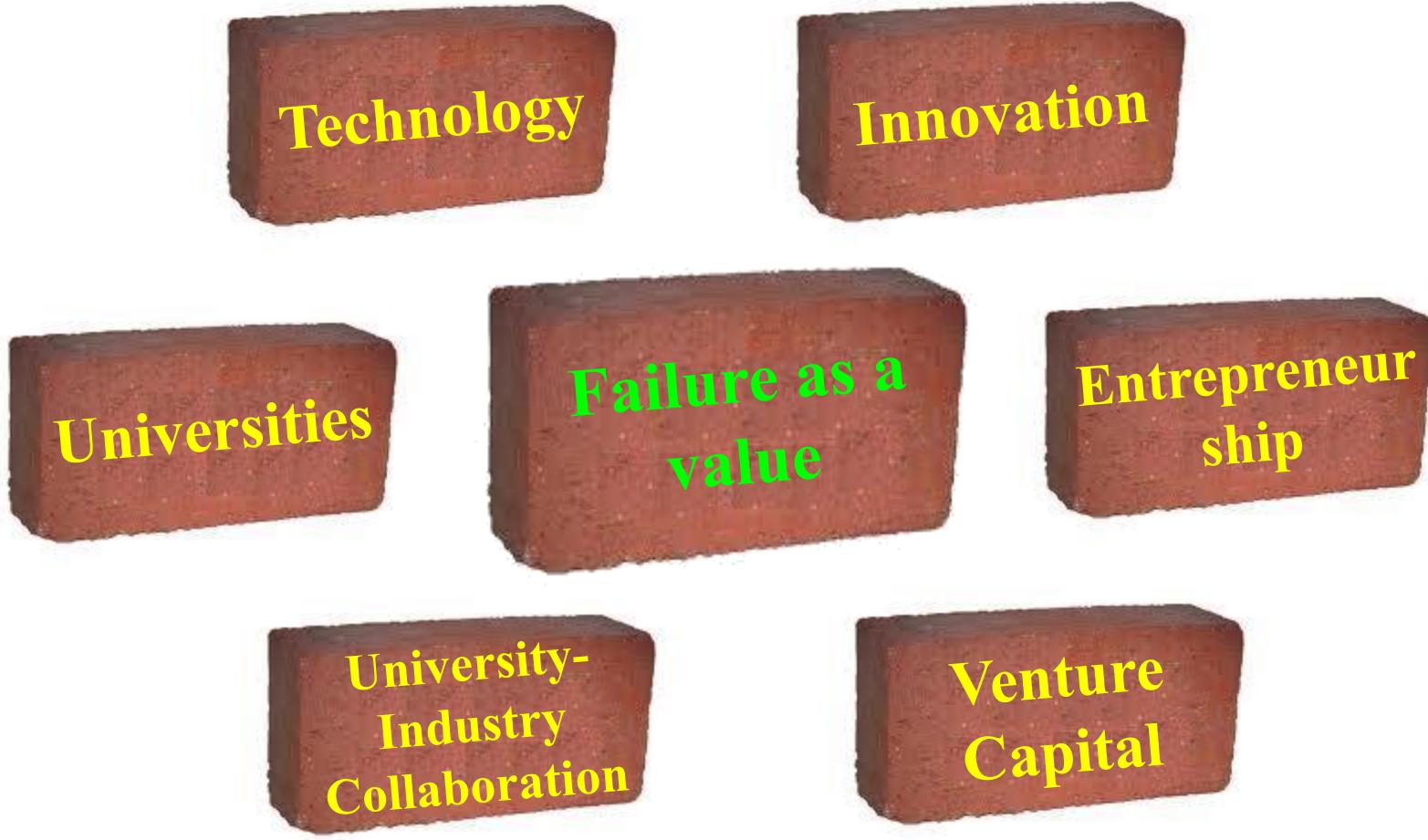
All these ingredients and more make the Silicon Valley the ideal location to identify, found and grow new technology start-ups.

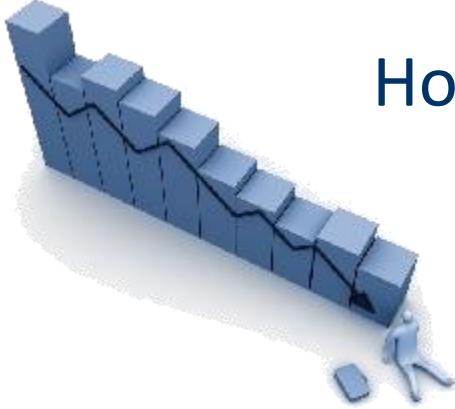
- A startup is a small organization used to search for a repeatable and scalable business model
- Entrepreneurs are the individuals who are great in doing anything necessary to find that business model

In Silicon Valley, startups are an industry and entrepreneurship is a profession.



The Silicon Valley system stands indeed on **seven** cornerstones





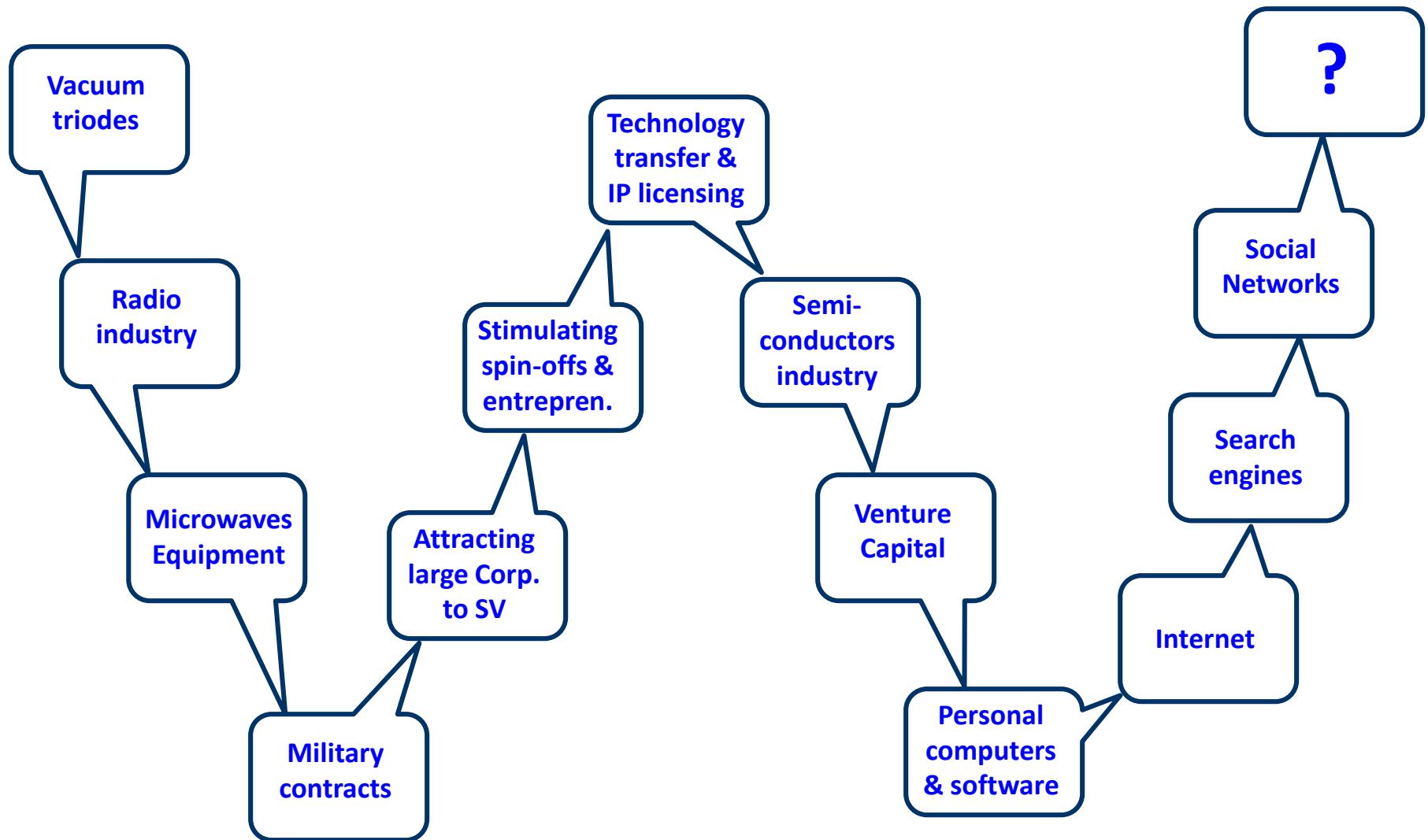
How is a failed entrepreneur called in SV ?

It is called **EXPERIENCE**

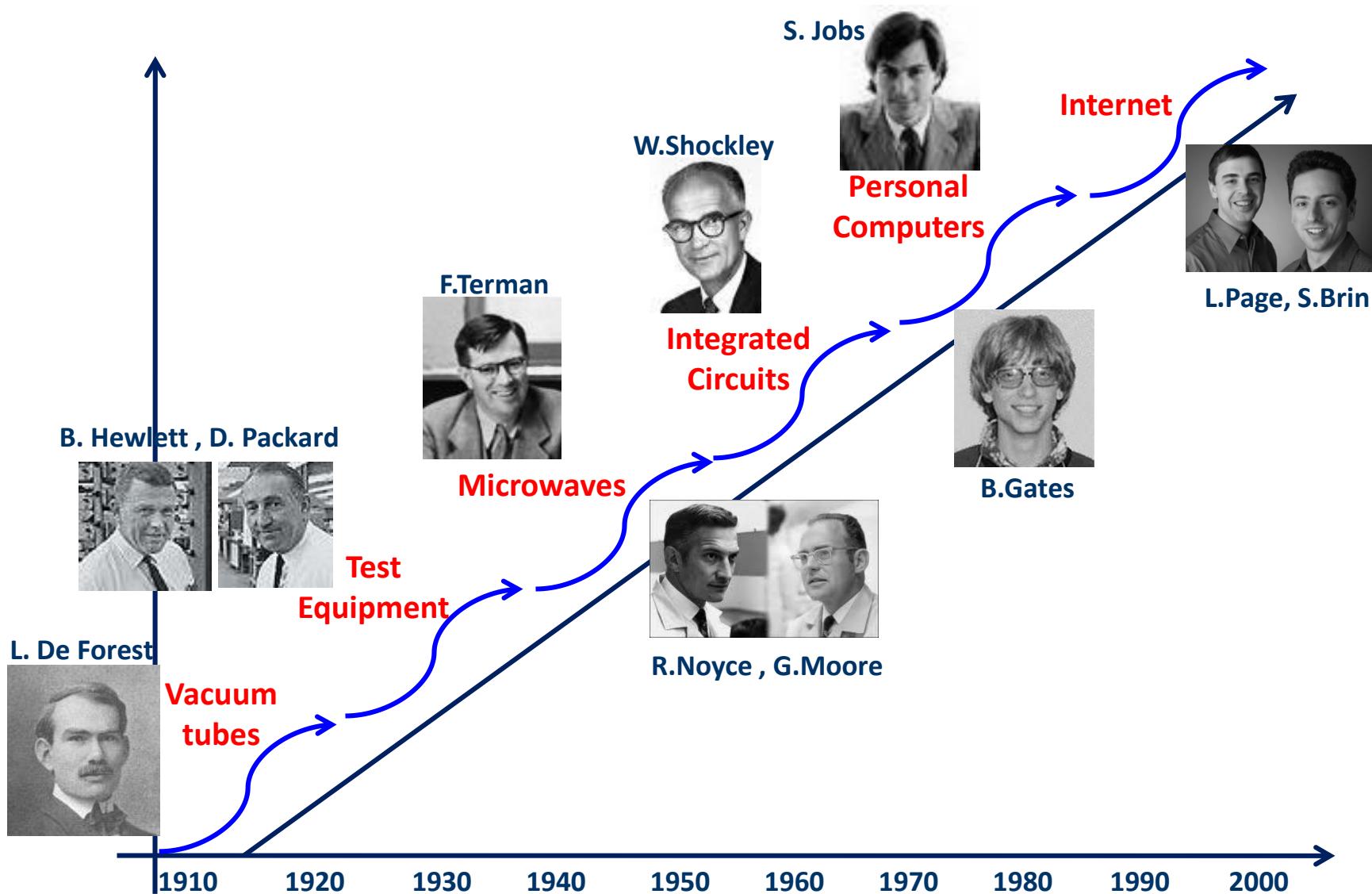
Everywhere in the world, if you fail you have embarrassed yourself, your family, community or even your nation.

Here, failure is accepted as experience. As long as you don't blame it on someone else, you have learnt many lessons, the most important hopefully being that you are not going to make that same mistake again.

the Development path of SV at a glance



SV celebrities



Q & A



Many thanks for your attention

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