Digital State:
The Story of Minnesota's Computing Industry

Thomas J. Misa
Charles Babbage Institute

1 Mar. 2015

tinyurl.com/ful-misa

Topics today . . .

1. Mn *was* Silicon Valley
2. Birth* in St. Paul's Midway
3. "Silver mine" (impacts...*)
4. "Gold mine" (consequences*)
5. Lessons for high-tech innovation?
6. CBI + what to 'see' today?

*(of Mn's pioneering computer industry)

California's 'Silicon Valley'

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Adobe

Apple

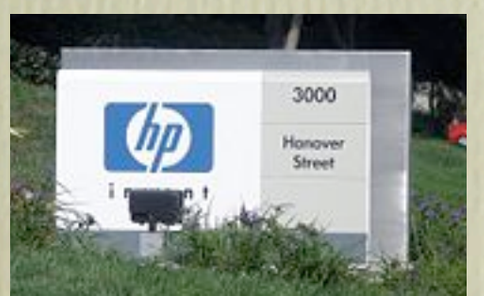
Cisco

eBay

Facebook

Google

HP



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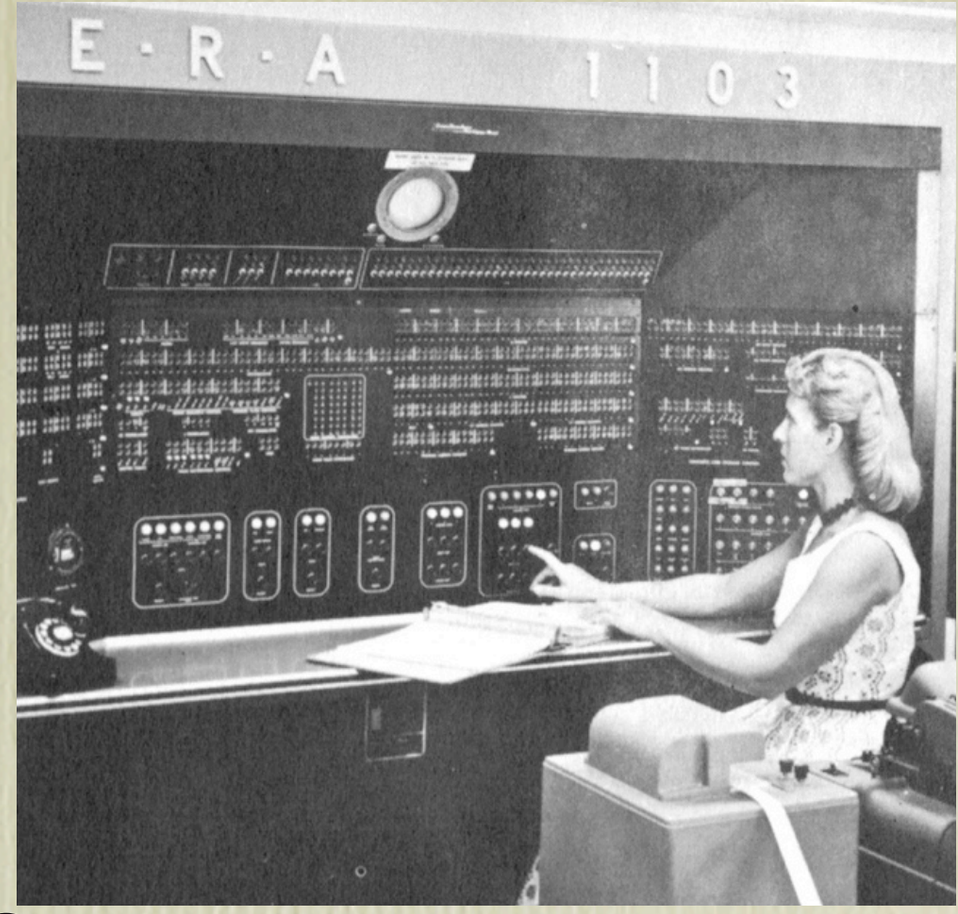
MN *was* Silicon Valley



- ‘stored program’ computer [1950]
- magnetic data storage
- computer industry
- ‘supercomputer’
- ‘first’ WWW

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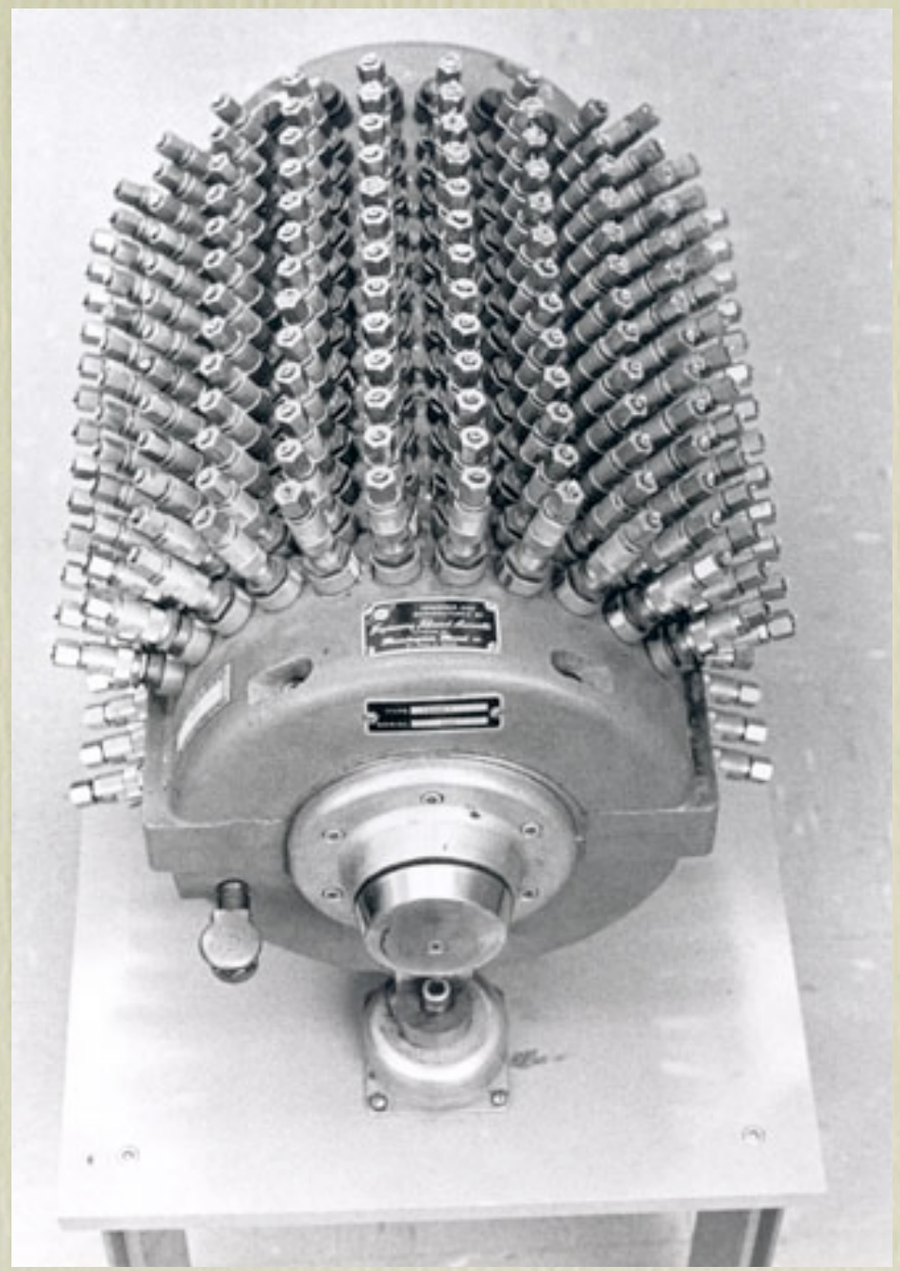

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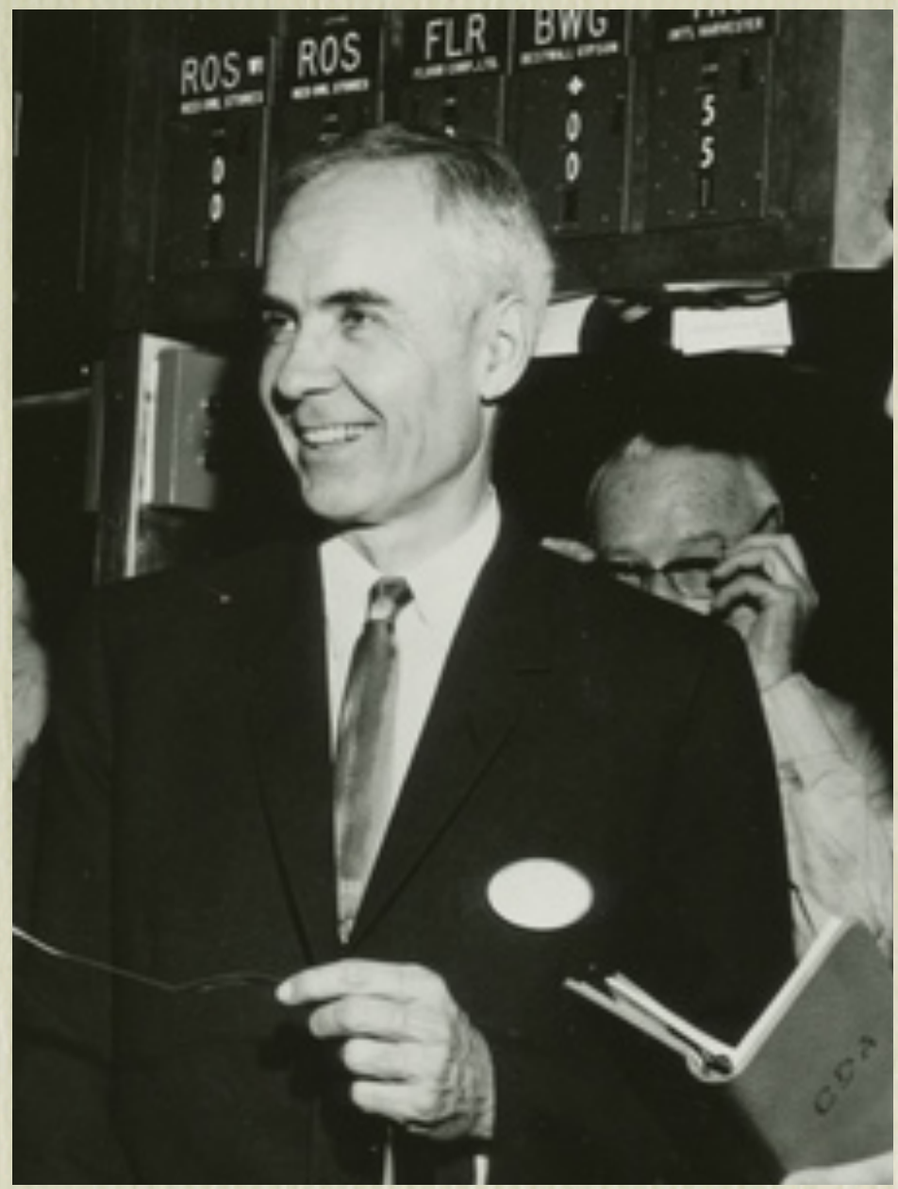

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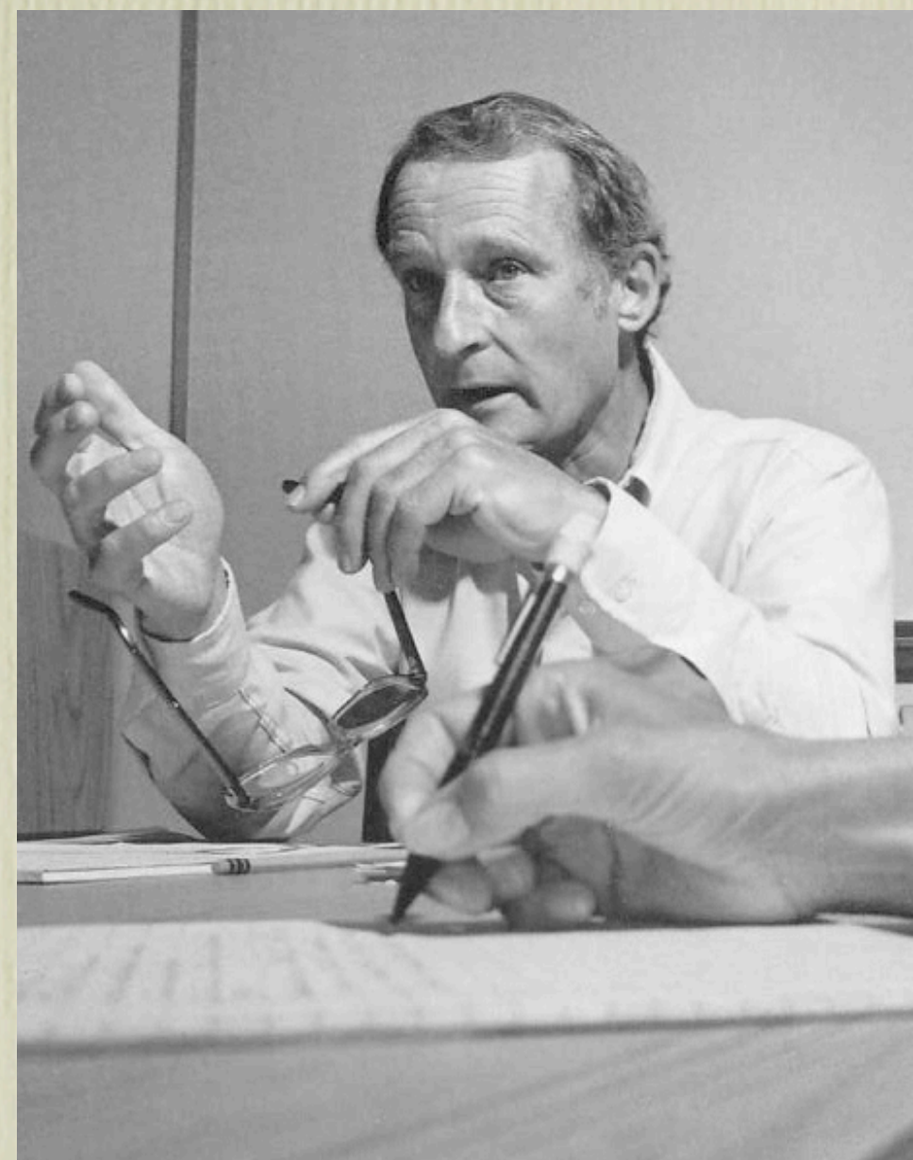

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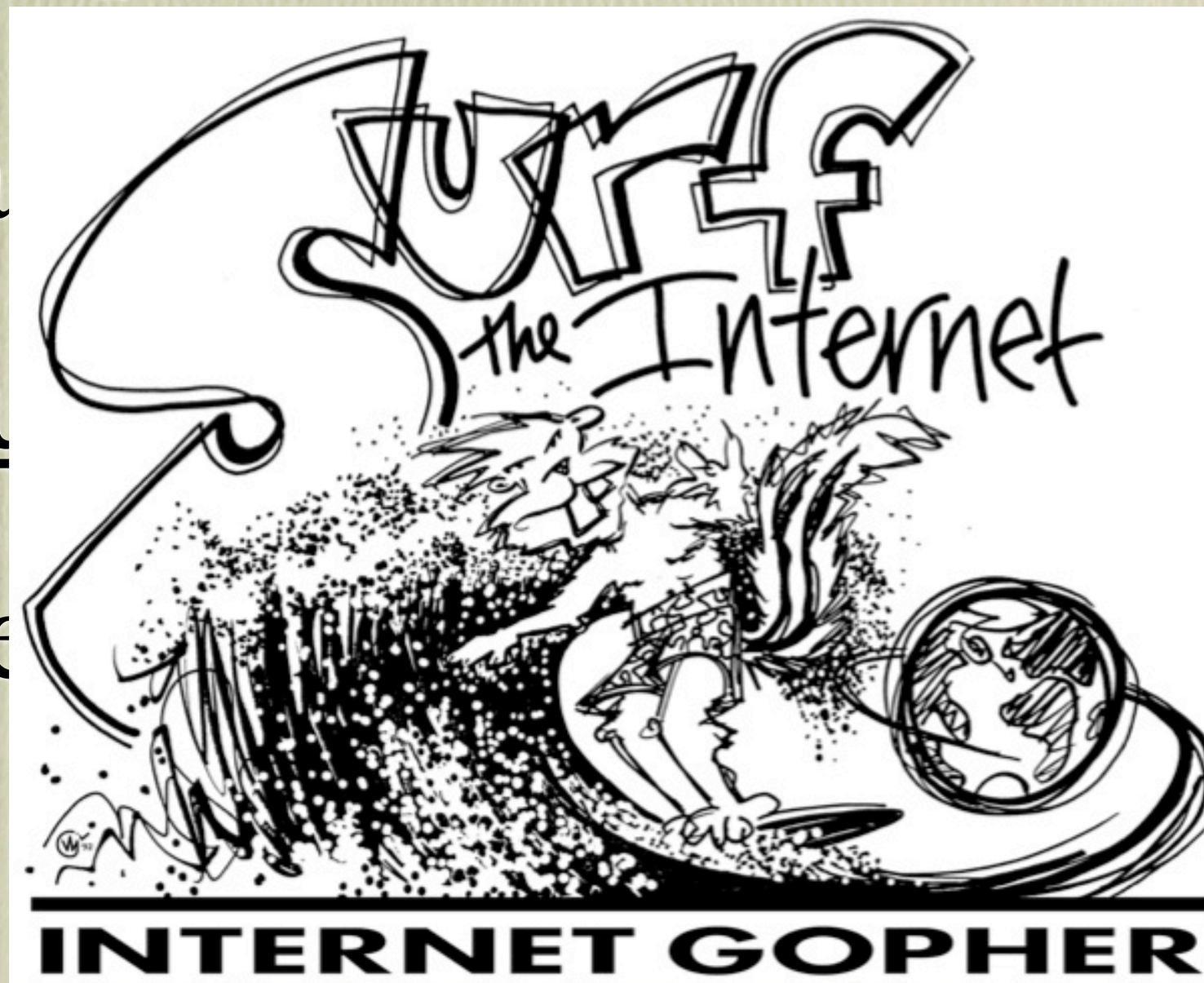

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Computer industry in St. Paul

- Secret crypto built Dayton OH … to wartime Washington
- John Parker's St. Paul glider factory
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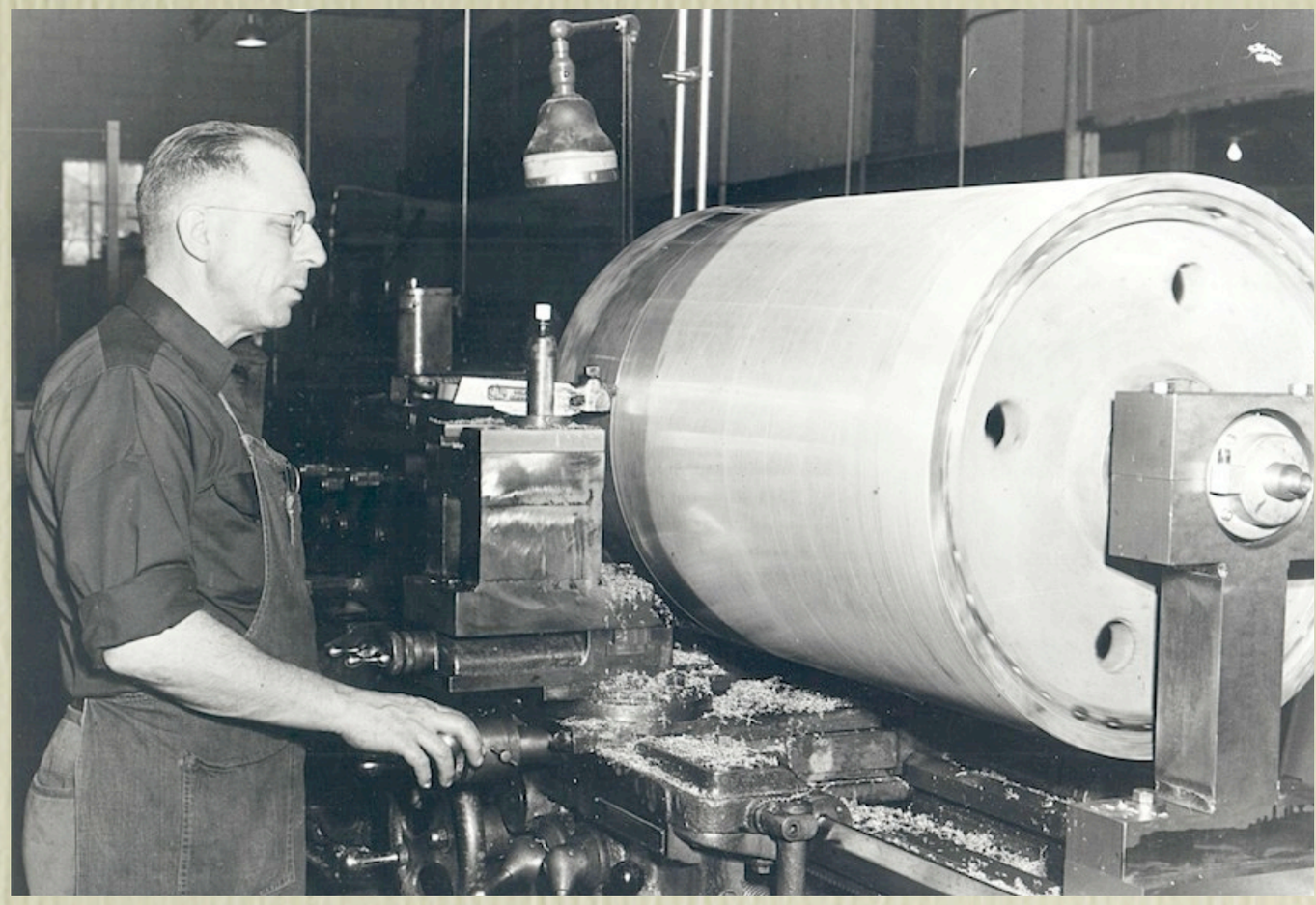
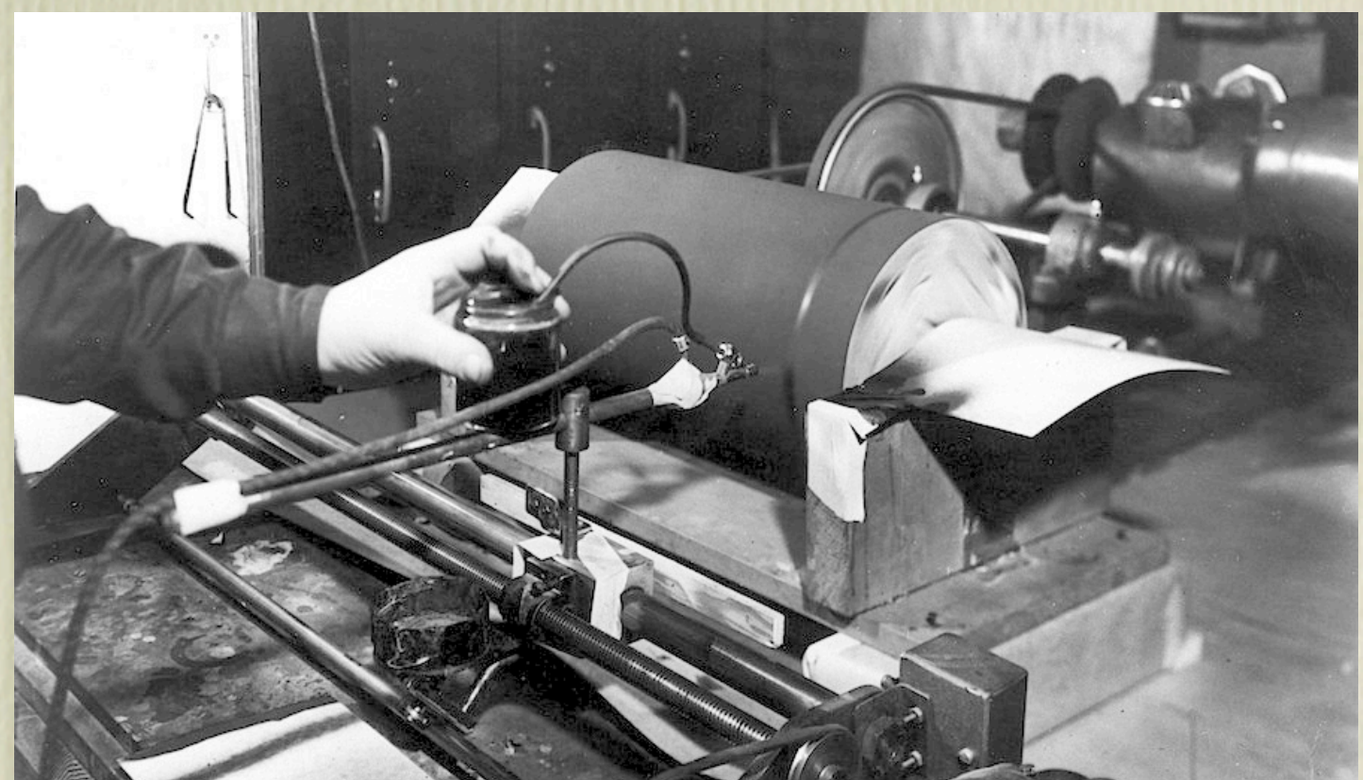
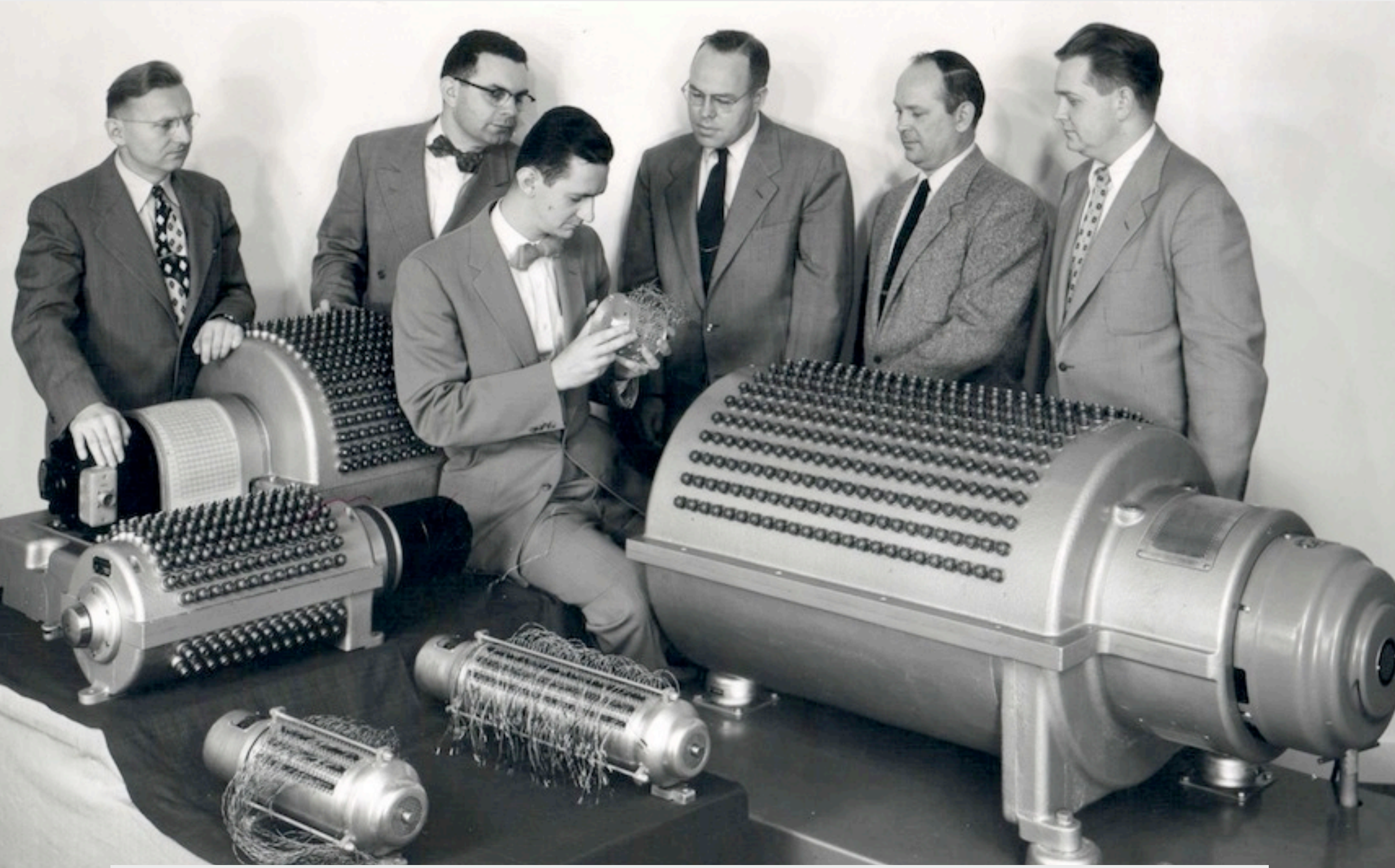
Birth in Midway industrial district

- Workers Snelling shops ➧ ERA



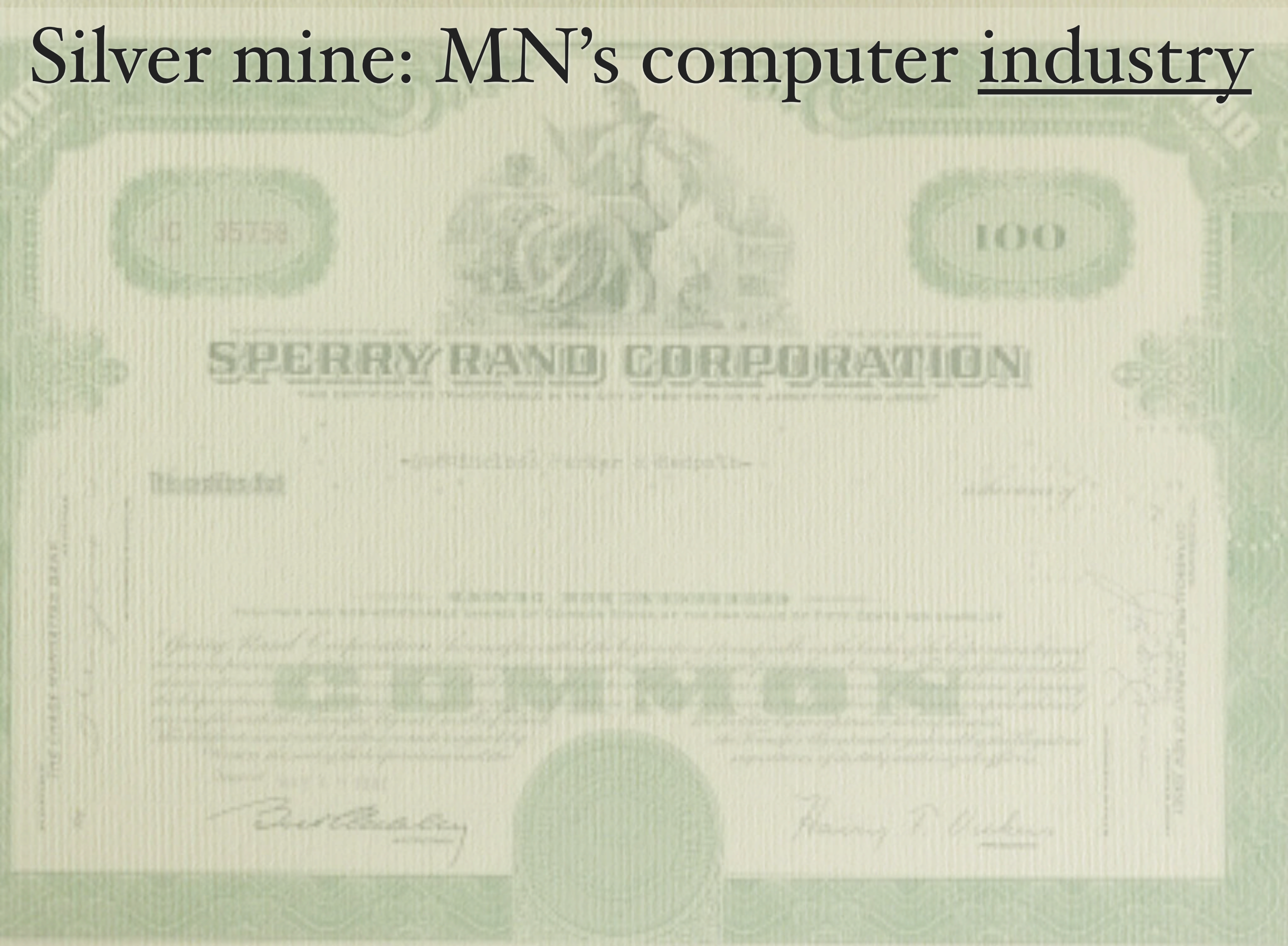
- Spray-on magnet ERA + 3M





ERA's Jack Hill, Arnold Cohen, Frank Mullaney☎,
Bob Perkins, Arnie Hendrickson, Bill Keye [c.1955]

Silver mine: MN's computer <u>industry</u>



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6. IBM-Rochester [1956--]

Silver mine: MN computer workforce

MN by mid-1970s . . .

- . . . 1.8% of US population
- . . . 3.3% of US manufacturing jobs
- . . . 12% of US $6B computer sales
- . . . 17% of US computer mfg jobs

Why ‘not’ Silicon Valley MN?

- ✓ Technology & innovation
- ✓ Computer-center ‘industrial district’
- ✓ Venture capital #2 [1958-63]
- ✓ Sales to military + govt + univ labs + FAA’s air-traffic control

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- ✦ Less visible in commercial markets
- ✦ No journalist’s “Silicon Valley” [1971]
- ✦ Secret work ⇔ public visibility?

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✓lessons for high-tech innovation?

Chasing Silicon Valley . . . .

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- Metro Detroit Tech Economy 'Equal to all of Silicon Valley' [2.12.2015]

Chasing Silicon Valley . . . .


Sand Hill Rd
EXIT
40

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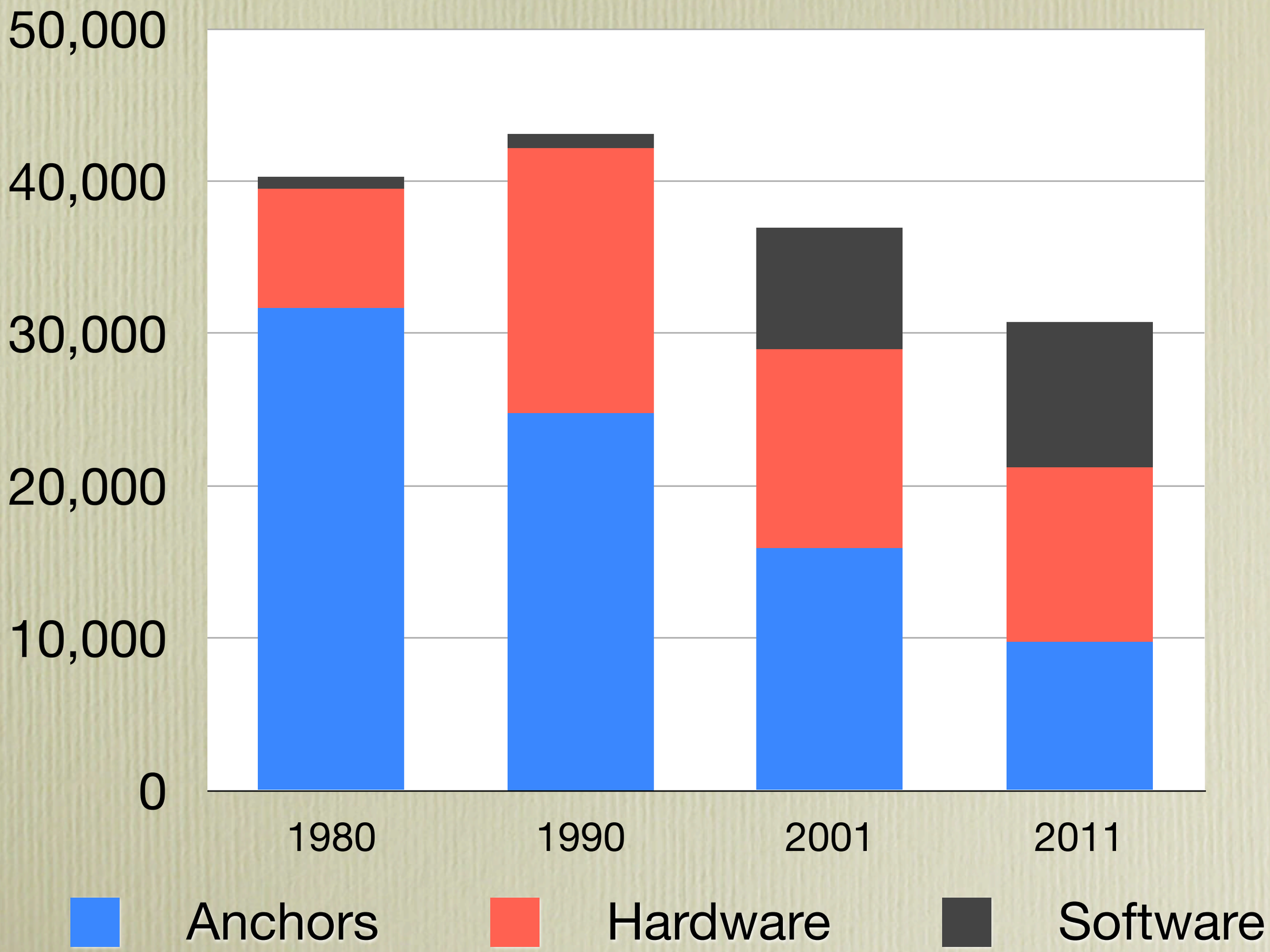
- Why Creating The Next Silicon Valley … Is The *Wrong Goal* [Forbes 7.2014]

Minnesota employment in computing (1980-2011)



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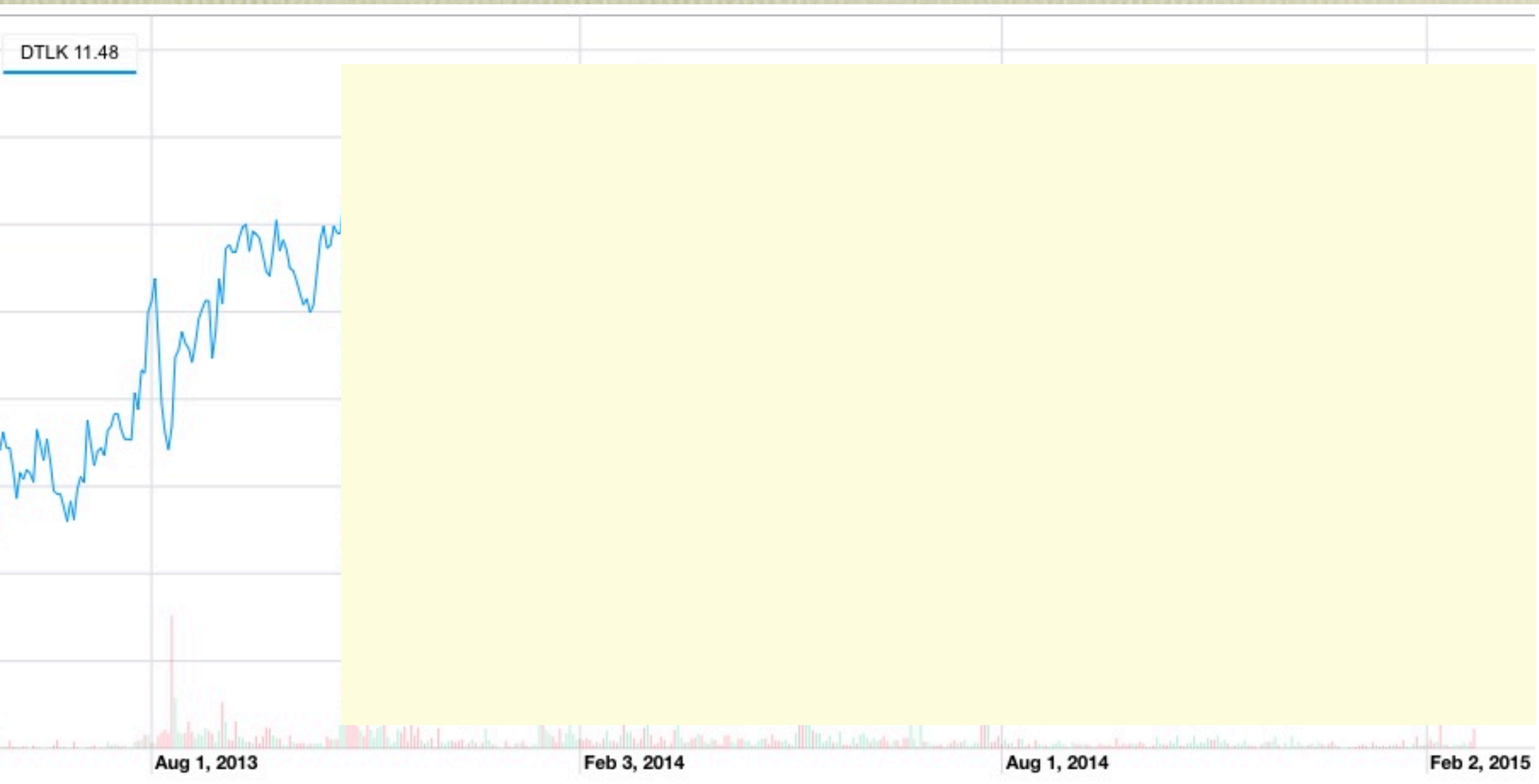
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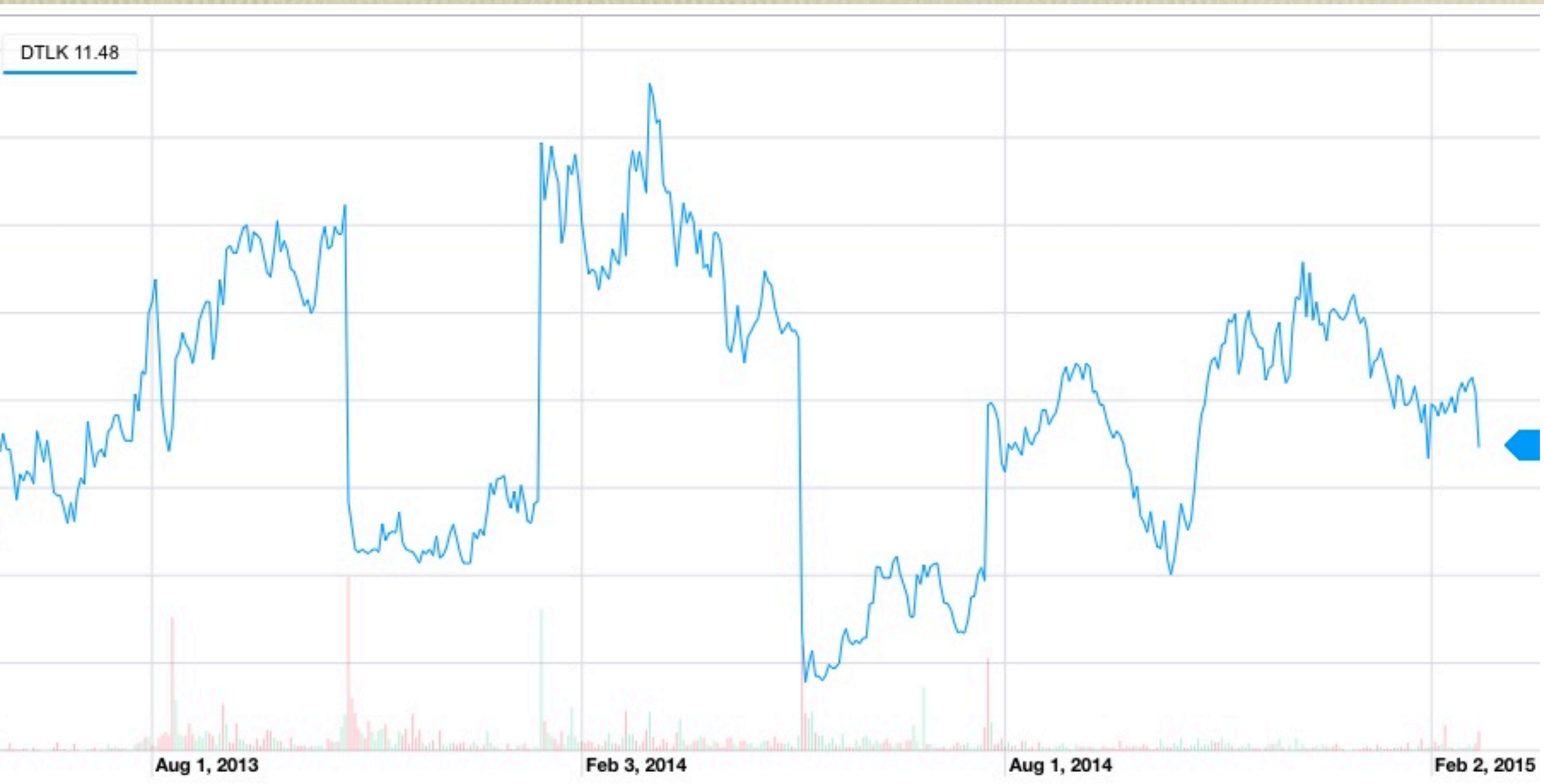
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CBI *from* CA *to* MN 1980

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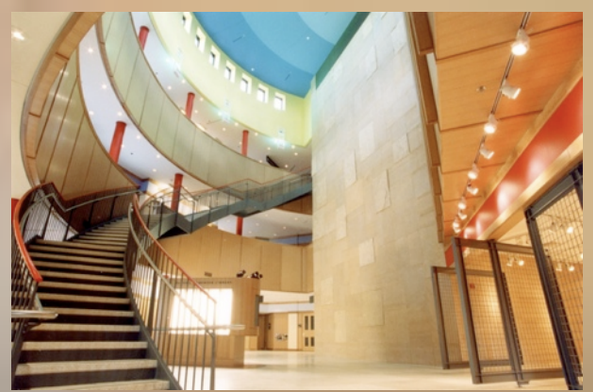
- 250 archival collections
- 400 oral histories
- 150,000 photos
- "1 mile" of paper records
- 4 staff + colleagues
- www.cbi.umn.edu



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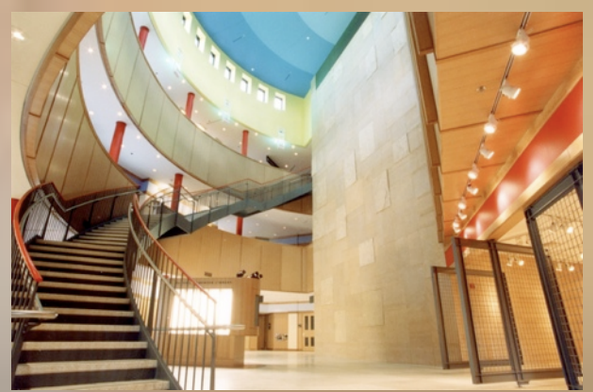
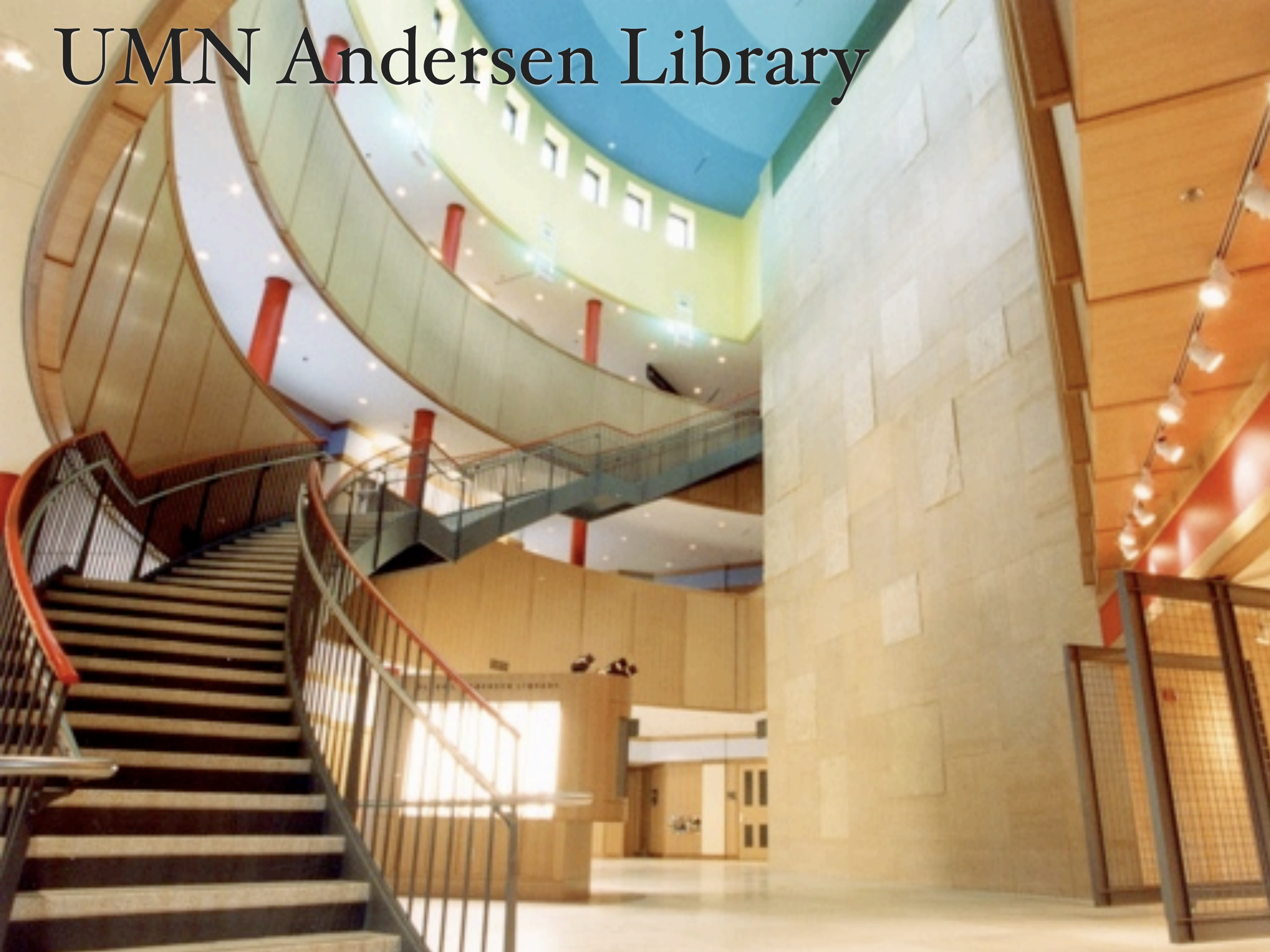
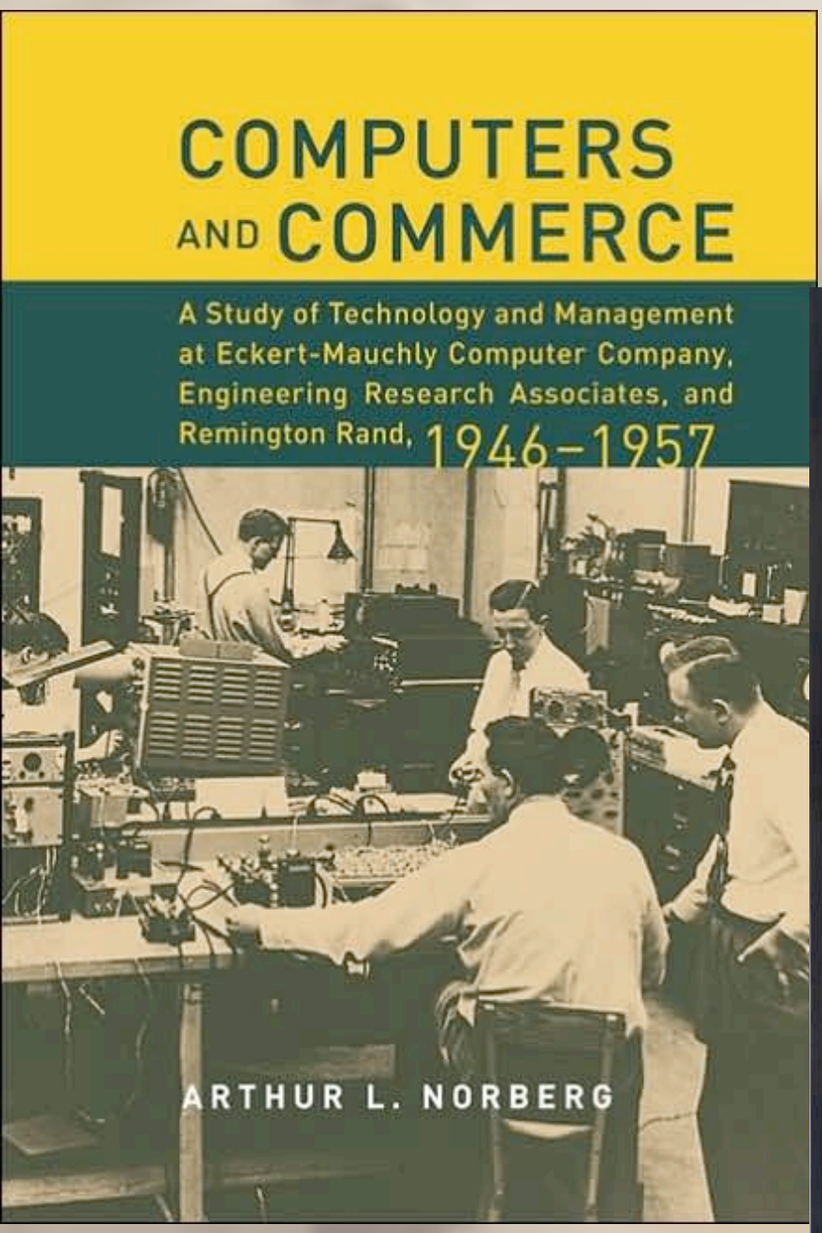
Charles Babbage (1791-1871)

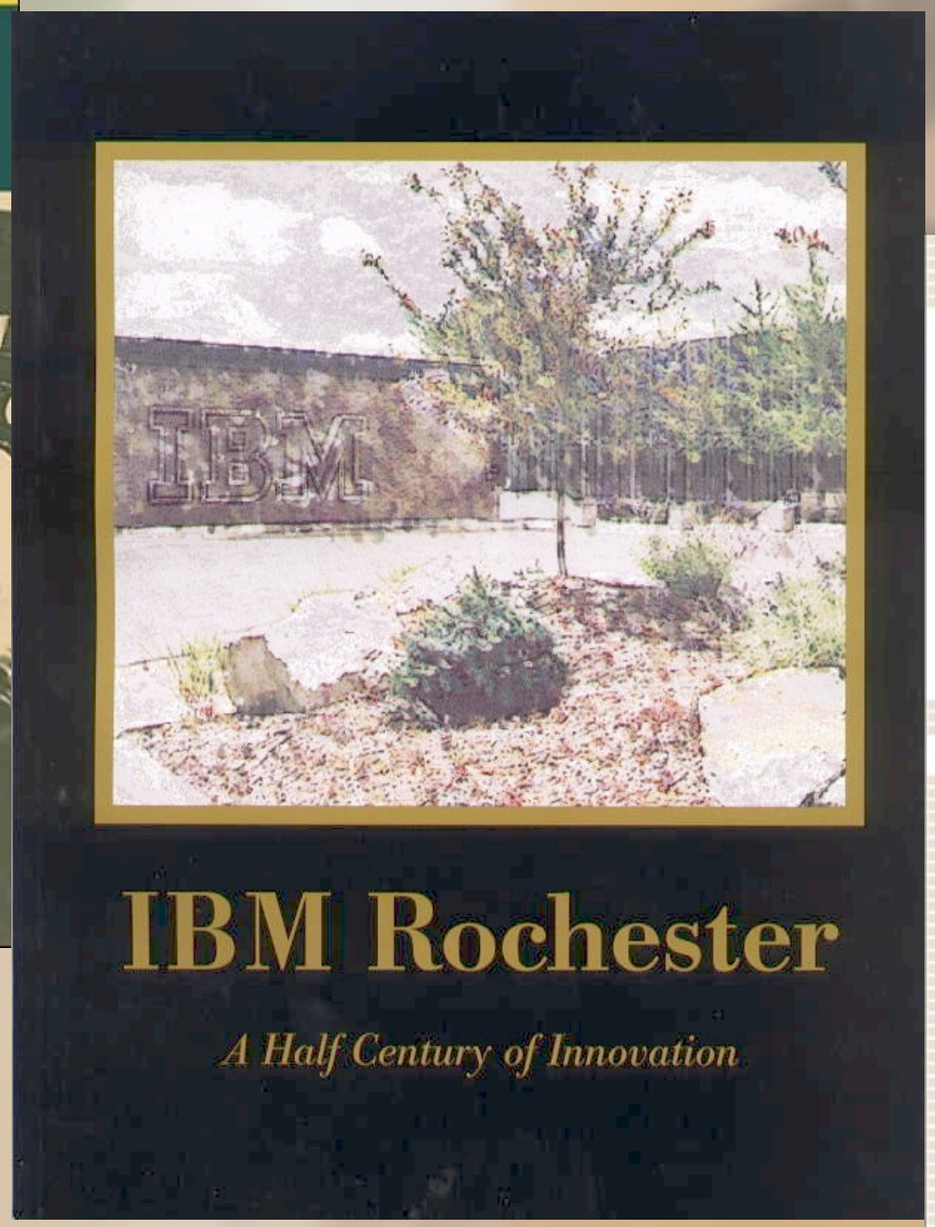


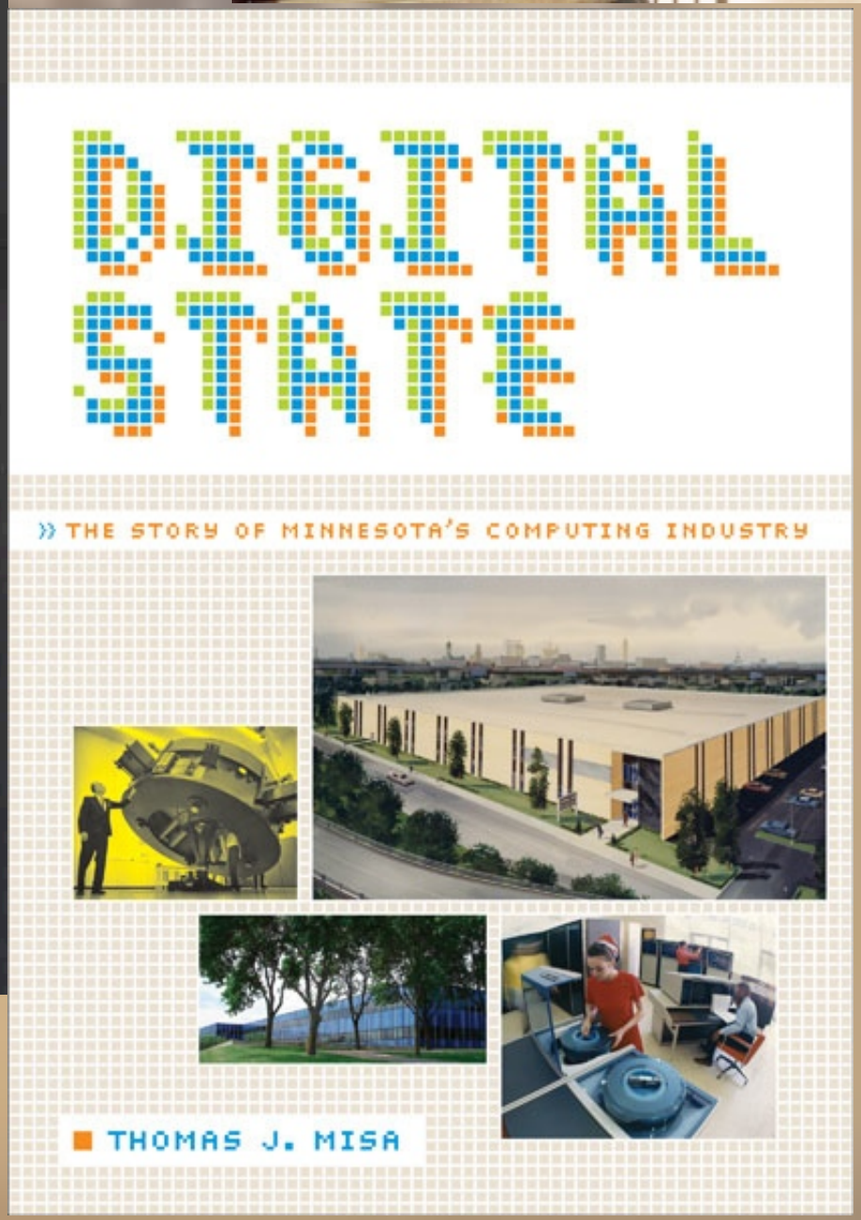
UMN Andersen Library



CBI *and* MN computing







What to see today?

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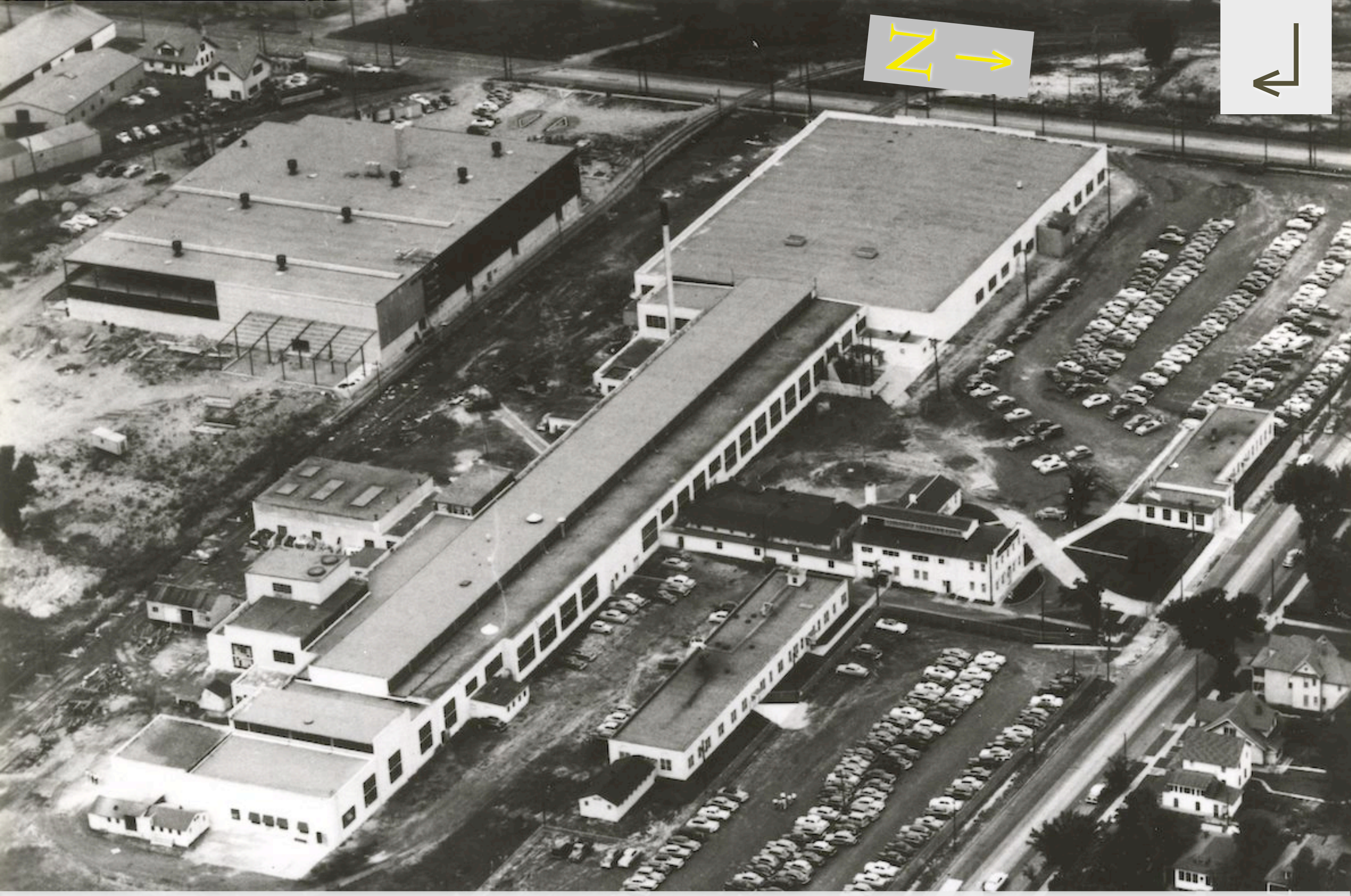
Univac West 7th/Shepard Rd (1956)

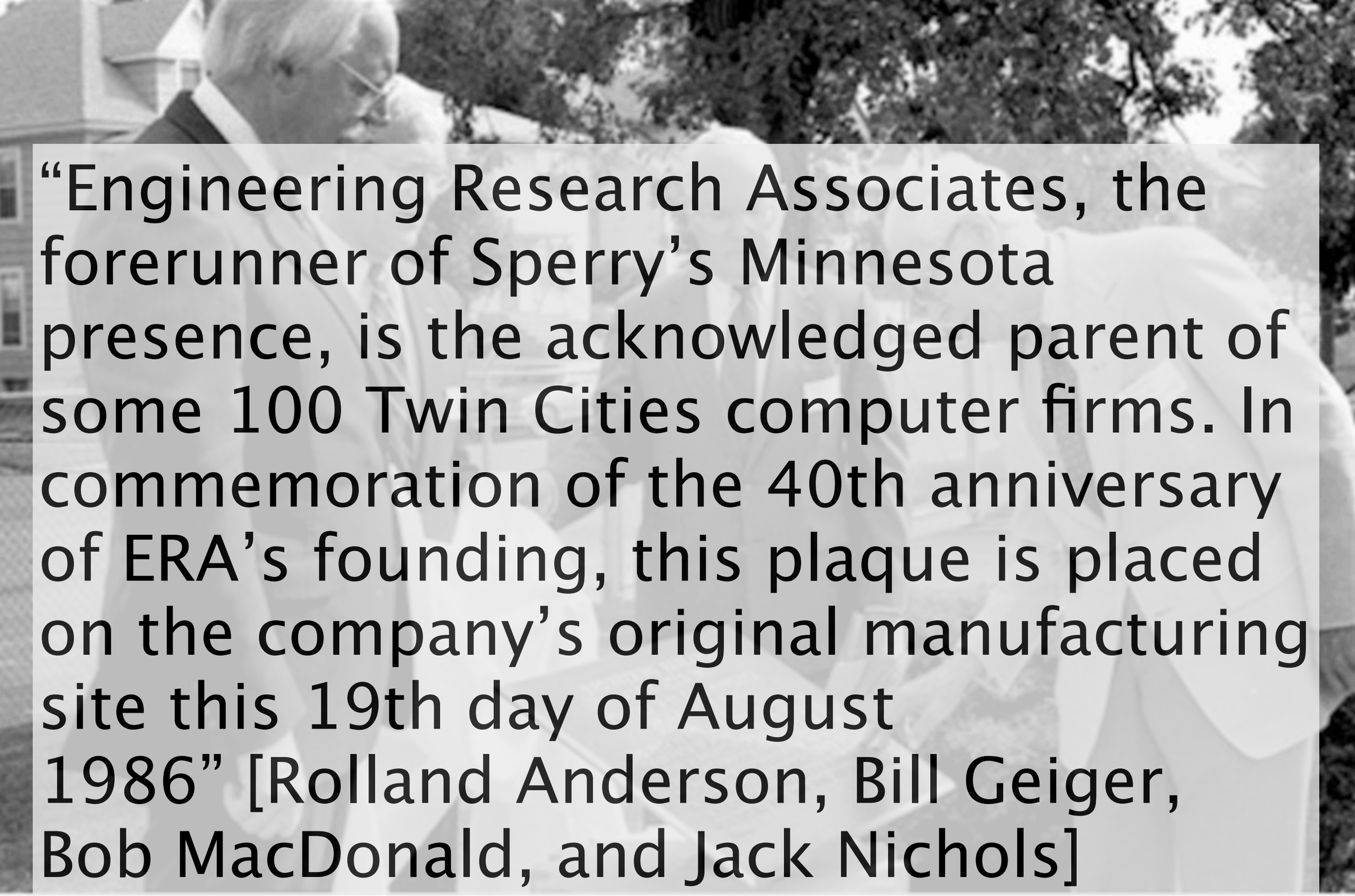
US Bank West 7th/Shepard Rd (2013)


Available
952 837 3040



ERA Plant #1 W. Minnehaha Ave. (c.1955)

Univac #2 W. Minnehaha Ave. (1986)



Univac #2 W. Minnehaha Ave. (1986)

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Control Data Northside plant (1967)

Control Data Northside plant (1973)

Control Data Northside plant (2013)

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Honeywell S Minneapolis (here:1940s)

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Honeywell relay department (c.1930) MHS

Honeywell S Minneapolis (c.1955) MHS

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Control Data 7801 Computer Ave. (1980s)

Control Data disk drive factory (1972)

Seagate 7801 Computer Ave. (2013)

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Control Data *now* Health Partners (1980s)

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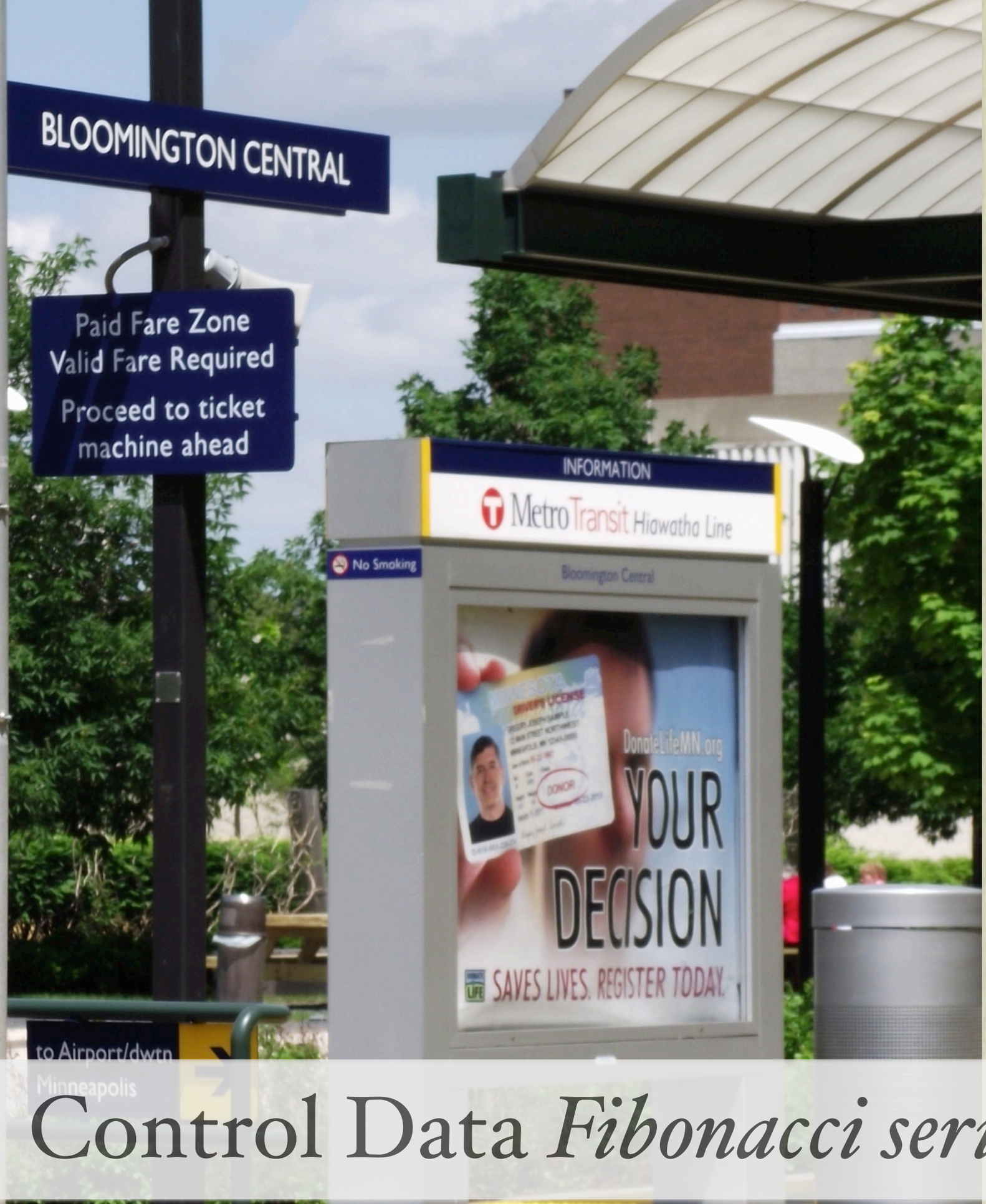
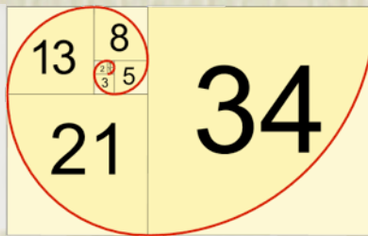


Control Data *Fibonacci series* (2004)



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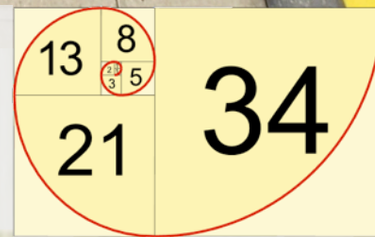

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DIGITAL STATE

» THE STORY OF MINNESOTA'S COMPUTING INDUSTRY

■ THOMAS J. MISA

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AN: Can you tell me something about . . . Goldberg?
FM: In those days . . . security was very tight. We didn't tell anybody what we were doing or who we were doing it for. But it was built around a magnetic drum with the information going on the magnetic drum and then . . . compare two or more tracks in different ways . . . . there were a lot of elements of computers in them . . . . The output was on a line printer . . . designed also at ERA. There were a lot of . . . things that went into computers like the magnetic drum, tape reader, tape punch, line printer . . . used for more general-purpose computers.
AN: Were all of those developed at ERA? *FM*: Yes . . .