20 Years

Well, actually, further back than that!
And 5000 years forward

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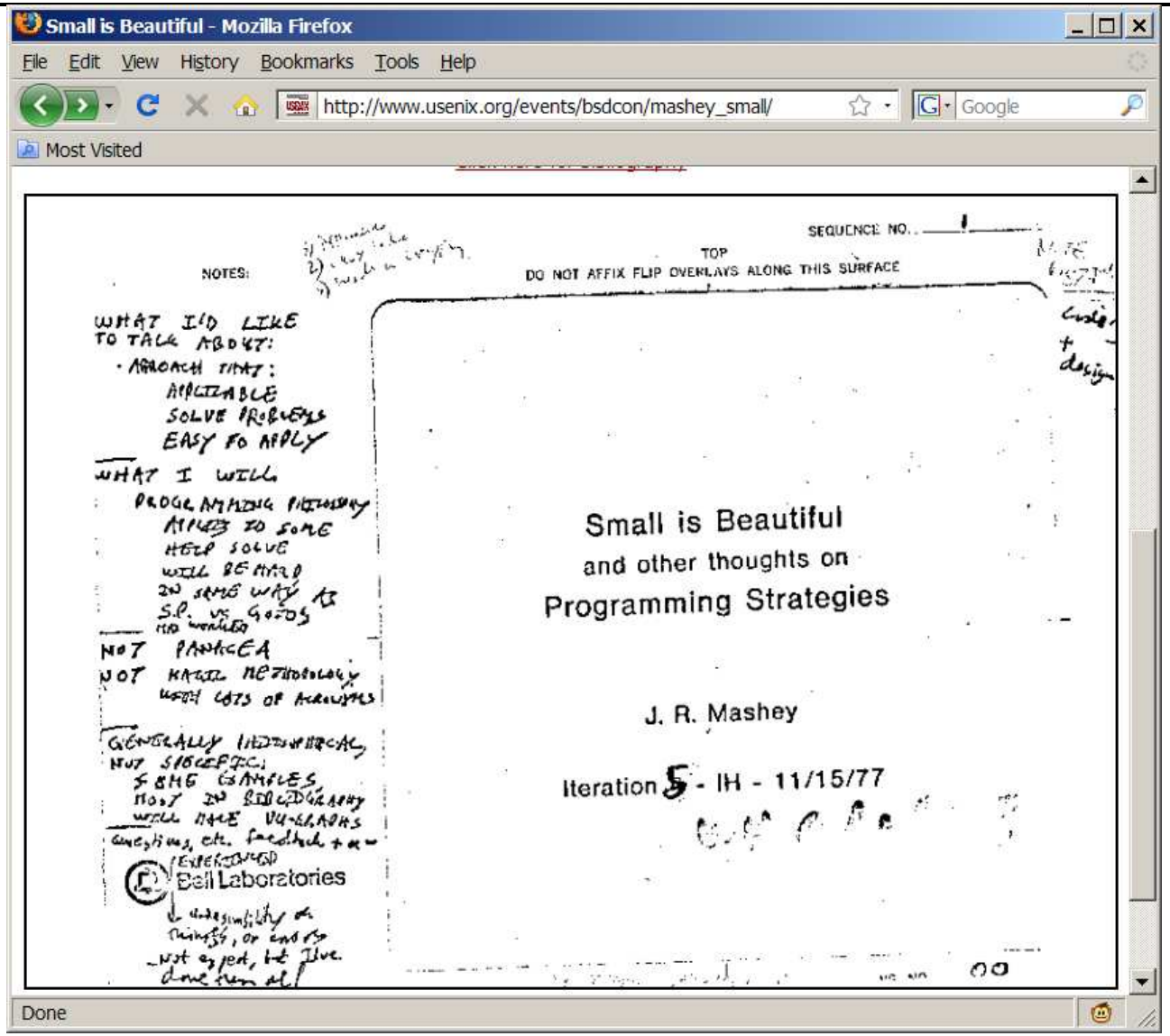
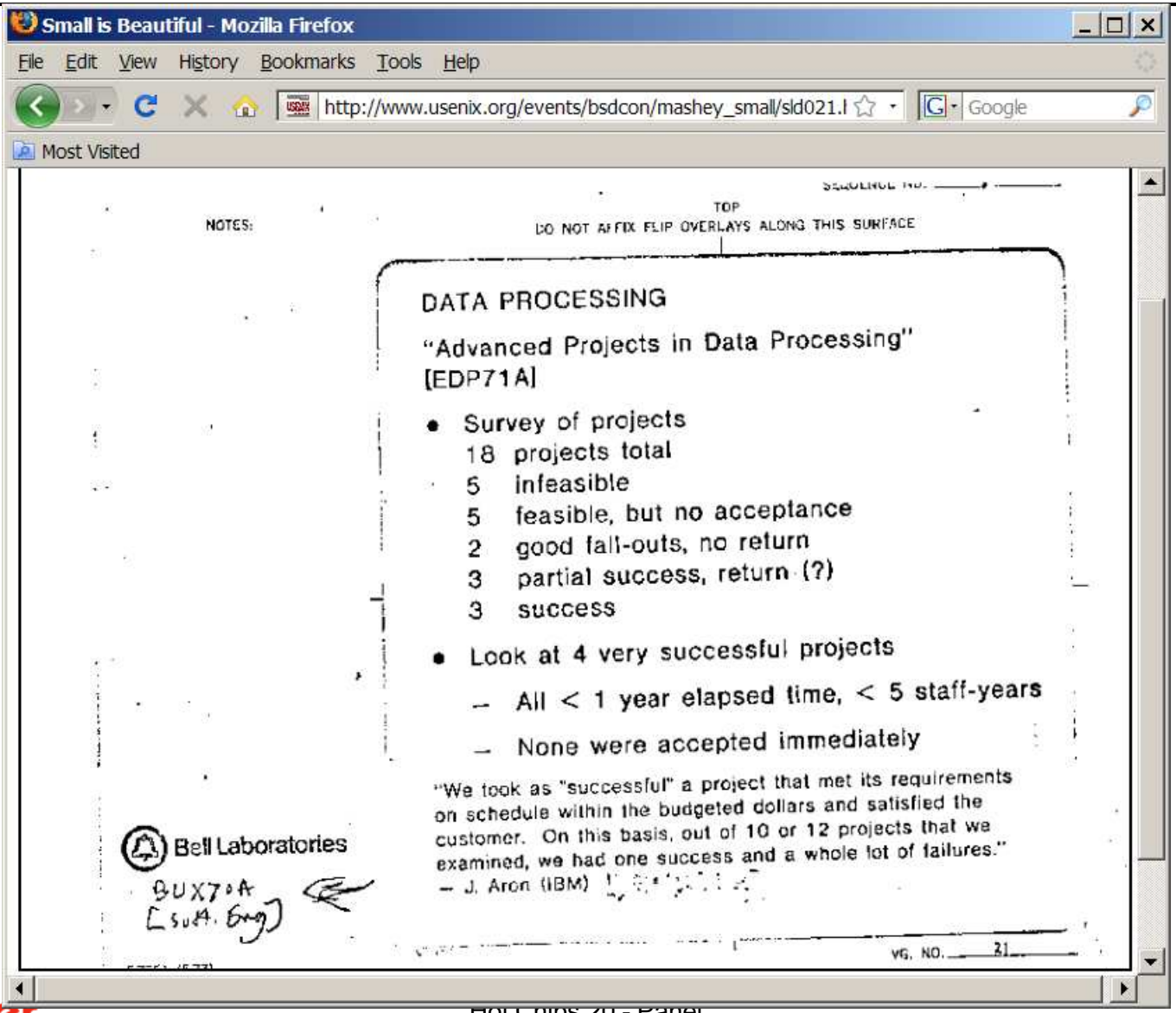
Overview

- Introduction
  - *Many failures, but no surprise*
- “Small is Beautiful and Other Thoughts on Programming Strategies”
  - 1977-1983,
  - dug out again in 2002, http://www.usenix.org/events/bsdcon/tech.html
- Why things fail
- Hot Chips 1989
- Baggage and Surprises

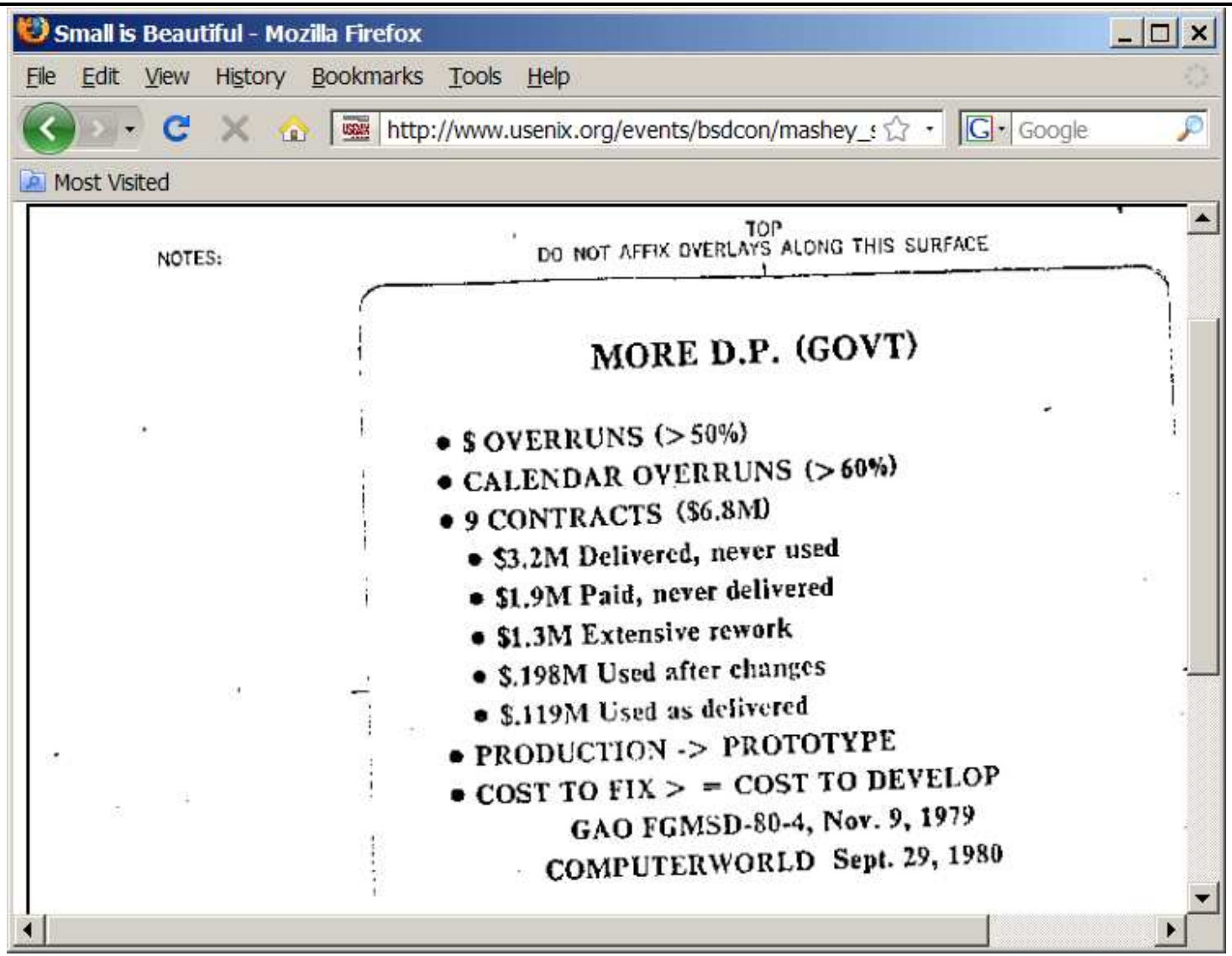
The 1977 talk



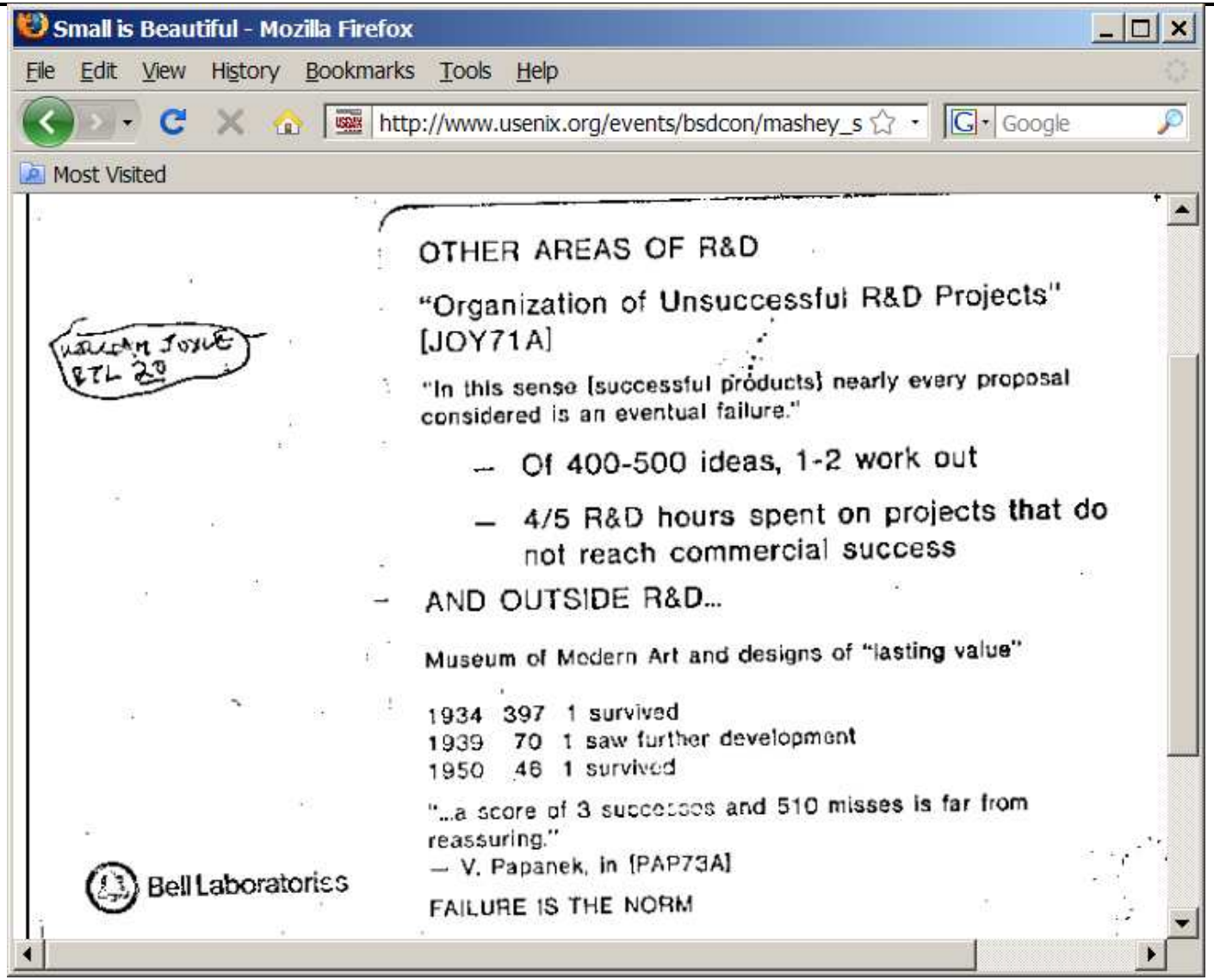
The 1977 talk – software failure



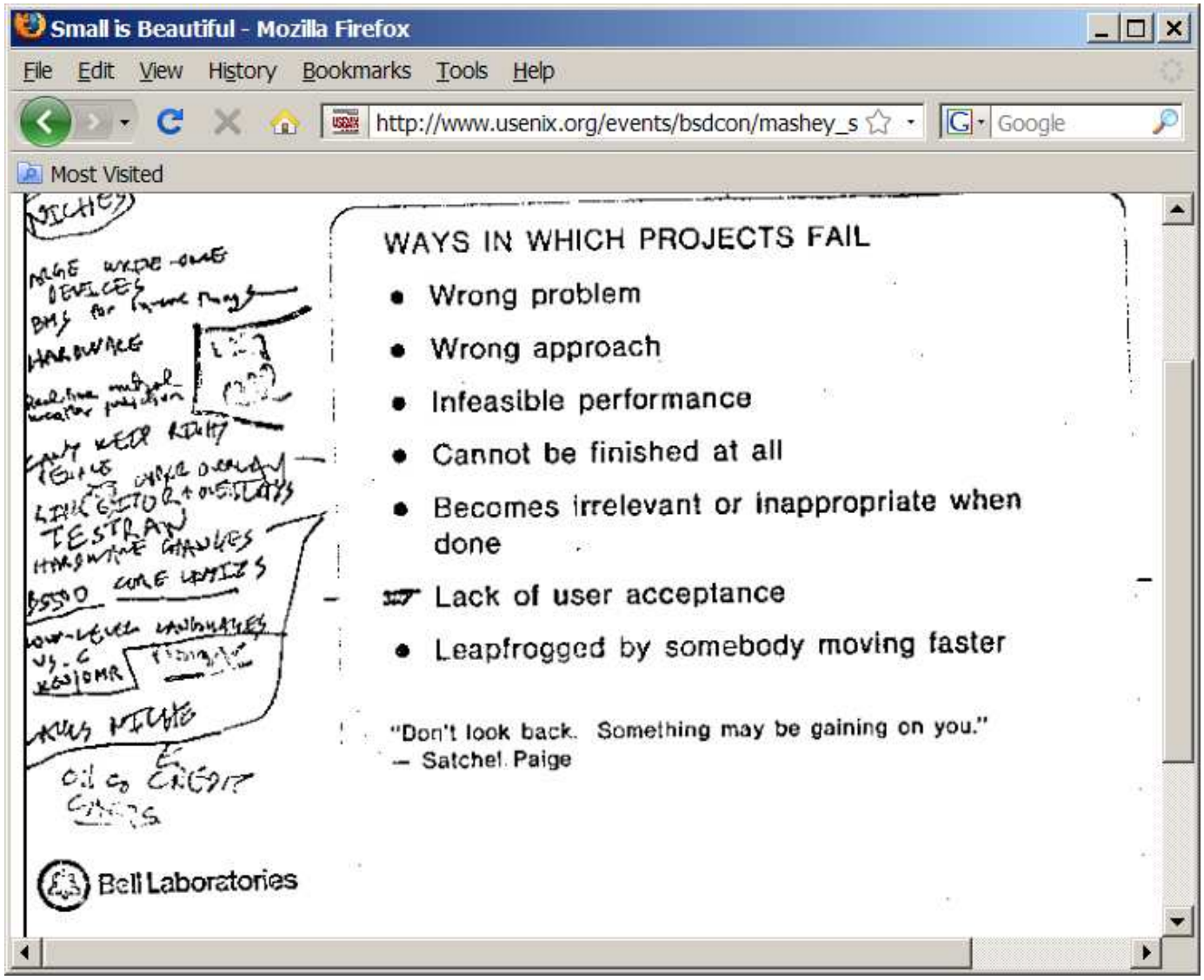
The 1977 talk – software failure



The 1977 talk – other failures



1977 – failure modes … and hardware?



1977 – failure modes … and how is hardware different?

- More $$
- (Usually)
- But (lack of) software can cause failure

Hot Chips 1989

- ECL SPARC Chip Set
- Architecture of the P1 – A 250 MHz SPARC in GaAs

  Mike O'Dell: Putting UNIX on Very Fast Computers or What the Speed of light Means to Your Favorite System Call, USENIX, Summer, 1990

- Intel i860 Million Transistor 64-bit Processor
- Panel Session : Compiler Issues with Hot Chips

- Building on-the-edge hardware is hard
- Building it without having software issues in good shape … deadly

Hot Chips 20 - 2008

- Biggest surprise - How long it took to get 64-bit CPUs
- Next biggest - C has evolved from 1973, but … 35 years
  - And of course, FORTRAN is still around, 50+ years
- And the future, 5000 years off, from Vernor Vinge, “A Deepness in the Sky”, quoted in ACM Queue - **Languages, Levels, Libraries, and Longevity**
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“The programs were crap…Programming went back to the beginning of time…There were programs here that had been written five thousand years ago, before Humankind ever left Earth. The wonder of it—the horror of it…these programs still worked…down at the very bottom of it was a little program that ran a counter. Second by second, the Qeng Ho counted from the instant that a human had first set foot on Old Earth’s moon. But if you looked at it still more closely… the starting instant was actually about fifteen million seconds later, the 0-second of one of Humankind’s first computer operating systems…

“We should rewrite it all,” said Pham.

“It’s been done,” said Sura.

“It’s been tried,” corrected Bret…“You and a thousand friends would have to work for a century or so to reproduce it… And guess what—even if you did, by the time you finished, you’d have your own set of inconsistencies. And you still wouldn’t be consistent with all the applications that might be needed now and then…”

“The word for all this is ‘mature programming environment.’”

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