Some Thoughts on Computing Technology and Society

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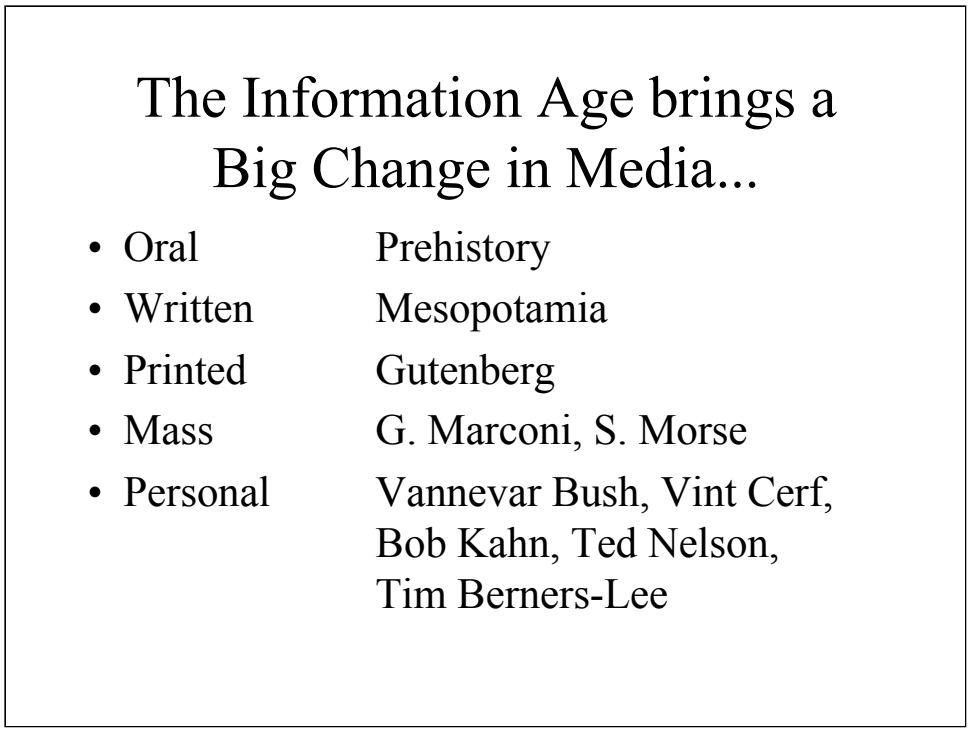


References

The Trial of Socrates, by I.F. Stone
Includes a discussion about what Socrates didn't like about books: you couldn't have a conversation with them.

The Culture of Time and Space, 1880-1918, by Stephen Kern
How the emergence of psychological time, the railroads putting in standardized time tables, relativity, etc. changed our perceptions of the world in this incredibly important period.

Endless Horizons, by Vannevar Bush
See the chapter "As We May Think", where "memex" anticipates hypertext.

Computer Lib/Dream Machines, by Ted Nelson
This is the book which is full of great speculations about hypertext and and early explanation of computers. It's been out of print for a while, but a new printing should be available sometime in 1999, I believe. It's not even on out-of-print sites like alibris.com.

Driven By Exponentials.

- Computing / Microcosm
  Gordon Moore's Law
- Communication / Telecosm
  George Gilder
- Miniaturization
  Richard Feynman
  Eric Drexler

References

Microcosm, by George Gilder
Out of print, a few copies available e.g. at alibris.com.

Telecosm, by George Gilder
This forthcoming book is about the telecommunications revolution, and its many impacts. Some of the draft chapters of the book are available at http://www.seas.upenn.edu/~gaj1/ggindex.html.

There's Plenty of Room at the Bottom, by Richard P. Feynman
A seminal talk on nanotechnology, given in 1959.
http://nano.xerox.com/nanotech/feynman.html

Engines of Creation, by K. Eric Drexler
The original popular book about Nanotechnology.

Unbounding the Future, by K. Eric Drexler
Less technical than the above.

Nanosystems: Molecular Machinery, Manufacturing and Computation
by K. Eric Drexler
More technical than the previous two.

Nanotechnology: Molecular Speculations on Global Abundance
by BC Crandall, ed.
Speculations about the impact of nanotechnology.

The Diamond Age, by Neil Stephenson
Science Fiction about Nanotechnology in the future.

http://nano.xerox.com
A web site about nanotechnology.

Biological Principles Should Come to Dominate.

- Mechanical / Industrial Systems
  - Isaac Newton
  - Henry Ford
- Complex Adaptive Systems
  - Charles Darwin
  - John Holland
  - Kevin Kelly
  - Murray Gell-Mann

References

Origin of Species, by Charles Darwin
A good read.

The Selfish Gene, by Richard Dawkins
More darwinism from the foremost modern defender of the faith.

The Meme Machine, by Susan J. Blackmore and Richard Dawkins
Dawkins invented the idea of a "meme" which is like the gene for an idea, in cultural evolution. This new book (which I am looking forward to reading soon), looks very interesting.

The Evolution of Cooperation, by Robert Axelrod
Game theory meets behavior.

Guns, Germs and Steel, by Jared Diamond
A BIG book tying many things (geography, history, evolution,...) together. A must read.

Hidden Order: How Adaptation Builds Complexity, by John Holland
An introduction to Complexity Adaptive Systems by a pioneer.

At Home in the Universe: The Search for Laws of Self Organization and Complexity by Stuart Kauffman
More material, as Holland's book is rather short.

Out of Control, by Keving Kelly
A popular introduction to "swarm systems", and the personalities involved in complexity science, robotics and the like.

The Quark and the Jaguar, by Murray Gell-Mann
The nobel-laureate colleague of Feynman, and founder of the Santa Fe Institute writes about Complex Adaptive Systems.

New Rules for the New Economy, by Kevin Kelly
Some interesting thoughts on the effect of the new rules on companies and the economy.

The Information Age Brings New Economics...

- Capitalism with Mechanical Age
  - Karl Marx
  - Adam Smith
  - J.M. Keynes
- New Information Age Economy
  - Thomas Jefferson
  - John Perry Barlow
  - Brian Arthur
  - Clayton Christensen

References

Das Kapital: A Critique of Political Economy, by Karl Marx and Friedrich Engels
Worth reading in the original.

The Wealth of Nations: An Inquiry into the Nature and Causes, by Adam Smith
The seminal book on capitalism and free markets.

General Theory of Employment, Interest and Money, by John Keynes
More about economics in the world of atoms.

The Economy of Ideas, by John Perry Barlow
http://www.eff.org/~barlow/EconomyOfIdeas.html. See also http://www.eff.org/~barlow/library.html.

Cybernomics: Toward a Theory of Information Economy, by John Perry Barlow
Available at http://www.ml.com/woml/forum.

Increasing Returns and Path Dependence in the Economy, by W. Brian Arthur
About the "network effect" and how increasing returns causes more monopolies and early winners amplified in the age of the internet.

The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, by Clayton M. Christensen
Important reading to understand why innovative firms fail to capitalize on new innovative ideas. About the economics and social aspects of innovation.

Learning and The Library (Answering Socrates?).

- Oral Tradition
- Writing
- Books
- Realia

Ray Bradbury
The Accountants
The Church
Brewster Kahle
Stewart Brand

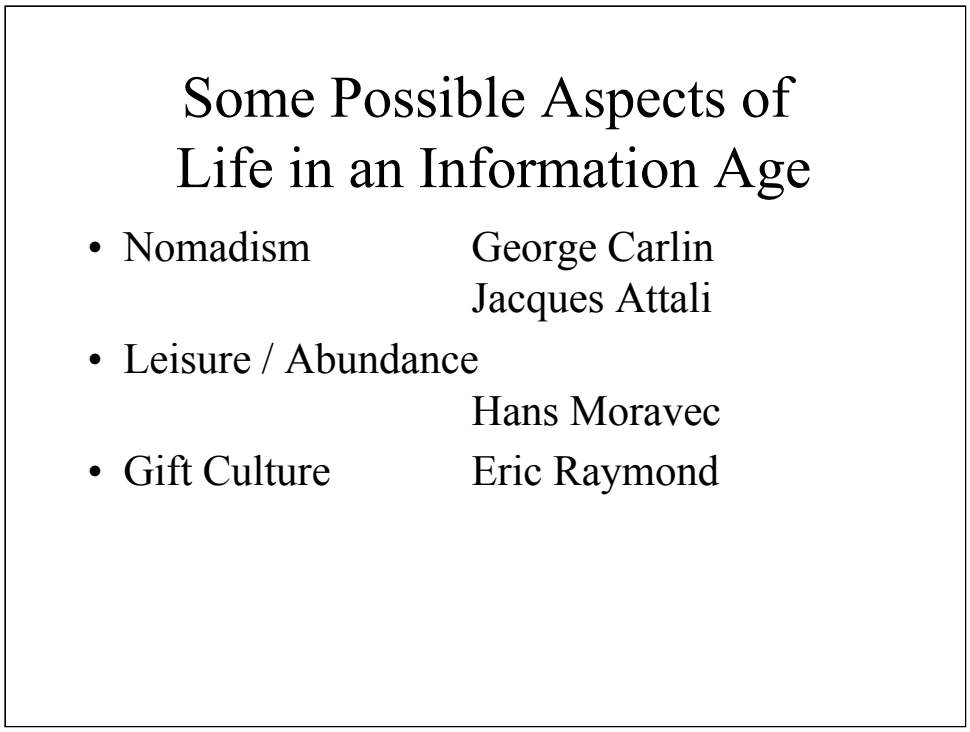
References

The Trial of Socrates, by I.F. Stone
As before.

Fahrenheit 451, by Ray Bradbury
A world without books.

Archiving the Net, by Brewster Kahle
Article from Scientific American available at http://www.archive.org.

<About archiving and libraries>, by Stewart Brand
I'm unable to find a hard reference to this, but have sent mail to Stewart.



References

Lignes d'Horizon, by Jacque Attali (french)
Millennium, by Jacques Attali (translation)

I'm trying to track these down. Books that influenced our thinking about "nomadic computing" that led to aspects of Java and Jini.

Robot, by Hans Moravec
See especially chapter 4.

The Age of Spiritual Machines, by Ray Kurzweil
Interesting to compare to above book, also about the impact of technology on lifespan, robotics and the like.

The Cathedral and the Bazaar, by Eric Raymond
Homesteading the Noosphere, by Eric Raymond
One of the leading proponents of "open source" talks about its social impacts, available at http://www.tuxedo.org/~esr/writings.

Some 21st Century Sciences

- Quantum Computing — Feynman, M. Gell-Mann
- Complex Adaptive Systems — John Holland, MGM, Kevin Kelly
- Human Centered Design — Don Norman
- Metaphors — George Lakoff

References

Feynman Lectures on Computation, by Richard Feynman
About Quantum Computers and Reversible Execution Computers.

The Feynman Processor: Quantum Entanglement and the Computing Revolution, by Gerald Milburn and Paul Davies
Less than totally satisfying introductory book. (See Holland, Kaufmann, Kelly, etc. books about CAS above)

The Invisible Computer: Why Good Products Fail, the Personal Computer Is So Complex, and Information Appliances Are the Solution, by Don Norman
A manifesto for simple and smart networked devices.

The Design of Everyday Things, by Don Norman

Things That Make Us Smart: Defending Human Values in the Age of the Machine, by Don Norman

Turn Signals Are the Facial Expressions of Automobiles, by Don Norman
More books about good design and cognitive science principles.

Machine Beauty, by David Gelernter
About elegance in technology design by a great thinker.

Mirror Worlds, by David Gelernter
Predicted the web and predicts a future world where simulation and data mining will dominate, helping to make computing devices more human centered.

Women, Fire and Dangerous Things: What Categories Reveal about the Mind, by George Lakoff

Metaphors We Live By, by George Lakoff and Mark Johnson
Understanding categorization, metaphors, and how the mind works is the key to future big breakthroughs in man-machine interface, and Lakoff is seminal reading in this area.

Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought, by George Lakoff and Mark Johnson
A new (and big) book, that I hope to read soon.

Threats

- Media Values / Unintended Consequence — Marshall McLuhan
- Disinformation — Aldous Huxley
- Depersonalization — Neil Postman
- Robotics — Hans Moravec, Ray Kurzweil
- Nanotechnology — Eric Drexler

References

Understanding Media: The Extensions of Man, by Marshall McLuhan
About the consequences of Mass Media.

Brave New World, by Aldous Huxley
Bleakly disinformed world.

Conscientious Objections: Stirring Up Trouble about Language, Technology and Education, by Neil Postman
A key book by a great thinker about these topics.

The Disappearance of Childhood, by Neil Postman
About how the transition from a written to a media culture has changed the lives of children.

Technopoly: The Surrender of Culture to Technology, by Neil Postman
Amusing Ourselves to Death: Public Discourse in the Age of Show Business, by Neil Postman
Other Postman books...

Robot, by Hans Moravec
The Age of Spiritual Machines, by Ray Kurzweil
As described above.

Engines of Creation, by Eric Drexler
And other Nanotech books, as above.

The Character of the 21st Century

- It's a time of great change and possibility
- Probably an era of abundance, not scarcity
- Can we avoid a new century of isms?
- Failure to understand new economics may be a source of great conflict

The Game is Afoot

- It's a great time to be Creative
- Limits of Imagination Major Limit
- Lots of Opportunity for Greatness:
  - Happiness is the exercise of vital forces
    along lines of excellence
    in a life affording them scope.
    - The Greeks, channeled by Marilyn French