



on determinism

History of Information
January 26, 2010

slides

<http://courses.ischool.berkeley.edu/i103/s10/SLIDES/HofIPDTDI-26.pdf>



aob



"Mouth of Hell"
Hours of Catherine of Cleves
1440

administrative issues?

waiting list clearing

assignments--please proofread

coming up: Manuscript Culture

see

"Demons & Devotion:
The *Hours* of Catherine of Cleves"

<http://www.themorgan.org/collections/works/cleves/default.asp>

Why the Apple Tablet (or iSlate) Will Change Everything

BY: Jerry Jackson, NotebookReview.com Editor

PUBLISHED: 1/26/2010

Apple's upcoming tablet computer, which is expected to be unveiled tomorrow, has everyone talking. Let's examine the most reliable rumors and explain why this will likely be the most important consumer electronic device since the iPhone.

NEWS

How Will Apple's Tablet Change Your World? Let Us Count The Ways...

Posted 12/31/2009 at 8:17:41am | by J.R. Bookwalter

Comments Print Email



Unless you've been living in a cave somewhere without access to the Internet, you've probably seen or heard something about a new tablet computer that Apple is rumored to be cooking up. But what you may not

agenda

confronting determinism

1. what is technological determinism?
- assignment

2. what's attractive about it?

3. examples old and new

4. how to think about it

reading for Thursday



concepts

causality

looking back to look forward

determinism

wishful thinking/whiggish history

necessary vs sufficient conditions

unintended consequences

moral hazard

Goodhart's law



I. what is it?

it's the claim that

"[N]ew technologies are discovered, by an essentially internal process of research and development, which then sets the conditions for social change and progress. Progress, in particular, is the history of these inventions, which 'created the modern world'

The effects of the technologies, whether direct or indirect, foreseen or unforeseen, **are as it were the rest of history."**

Raymond Williams, *Television, Technology, and Cultural Form*

what is td?



Heilbroner's example



what history tells us

"The hand-mill gives you society with the feudal lord; the steam-mill society with the industrial capitalist."

--Karl Marx



in full

"[M]en make cloth, linen, or silk materials in definite relations of production. ... these definite social relations are just as much produced by men as linen, flax, etc. Social relations are closely bound up with productive forces. In acquiring new productive forces men change their mode of production; and in changing their mode of production, in changing the way of earning their living, they change all their social relations. The hand-mill gives you society with the feudal lord; the steam-mill society with the industrial capitalist."

Karl Marx, *The Poverty of Philosophy*, 1847



counter-examples

trend spotting

"Engineers and managers engaged in prediction prefer the extrapolation of trends to the formulation of complex scenarios factors influencing the growth ... were, by implication projected into the future.

doubt raising

"History, of course, raises grave doubts about such extrapolations, but the study of history is not required of engineers and managers." --Hughes, *Networks of Power*, 1983

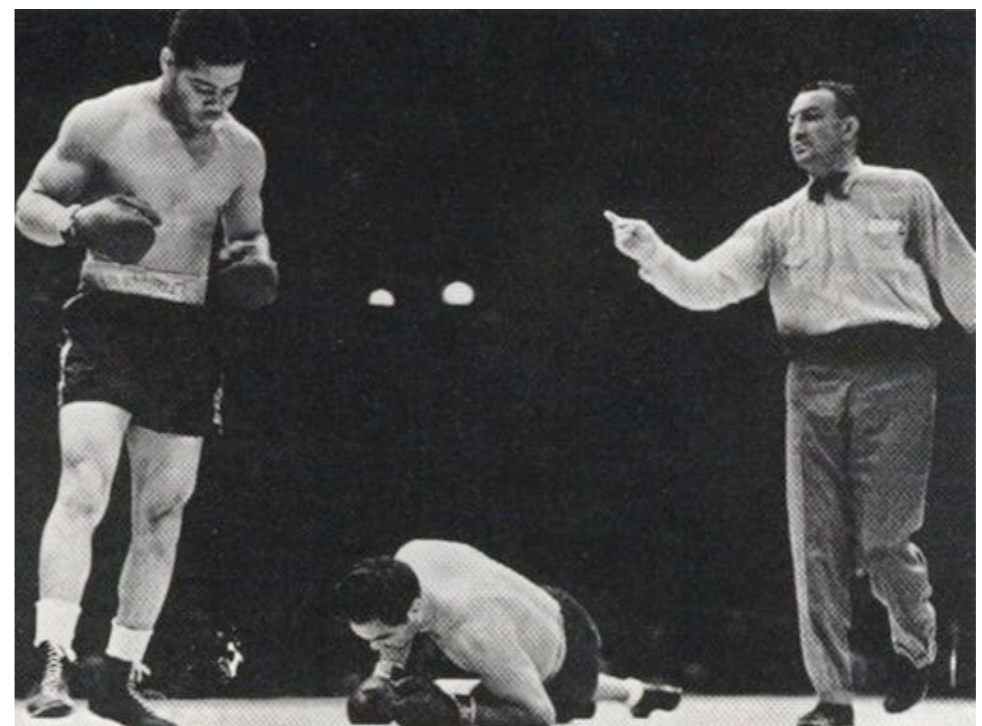


taking sides

Heilbroner -- machines did it

Hughes -- no they didn't

best of friends?



what is td?



causality

if we are the information age,
looking back
what got us here?

if it got us here,
looking forward
will it work (can it be stopped) elsewhere?

eg ICTD
greenhouse gasses





H.G. Wells
1866-1946

don't look back

professors of foresight

"It seems an odd thing to me that though we have thousands and thousands of professors and hundreds of thousands of students of history working upon the records of the past, there is not a single person anywhere who makes a whole-time job of estimating the future consequences of new inventions and new devices. There is not a single Professor of Foresight in the world. But why shouldn't there be?"

H.G. Wells, "Wanted -- Professors of Foresight," 1932



[Not Since The Invention Of The Wheel... Quest - EverQuest 2](#)

EverQuest 2 - Not Since The Invention Of The Wheel... Quest

eq2.gamepressure.com/quest.asp?id=285 - *Cached* -

[Not Since The Invention Of Television Have Consumers Had So Much...](#)

Not since the invention of television have consumers had so much choice . Watch out, consumers —it's a TV jungle out there. The array of new types and sizes ...

news.google.com/newspapers?nid=1955&dat=20030626&id... -

[Awful Announcing: Not Since The Invention Of The Glow Puck, Has A...](#)

Jul 24, 2007 ... Not Since The Invention Of The Glow Puck, Has A Graphic Been This

Distracting ... Not Since The Invention Of The Glow Puck, Has A Gr. ...

awfulannouncing.blogspot.com/.../not-since-invention-of-glow-puck-has.html -

Cached -

[elevatorchannel.com](#)

Not since the invention of the wheel allowed us to move near things far, helped us grind big things small and enabled us to turn left on Wilshire has a big ...

www.ericmaurice.com/elevatorchannel/flash.html -

[BonusCommissions.com | The Profit Solution for Innovative Agents](#)

Maybe not since the invention of dirt - but a long time, nonetheless. There's one thing we want to be crystal clear on. ...

www.bonuscommissions.com/ - *Cached* -

[Third World CyberActivists](#)

Not since the invention of the printing press have the people of the world been privy to so much information. With the invention of the printing press, ...

www.nathanielturner.com/thirdworldcyberactivists.htm - *Cached* -

[Revolutionary Invention Takes An Industry to the Next Level...](#)

Aug 14, 2007 ... [youtube]oCP0aMd8cM0[/youtube] Not since the invention of sliced bread has their been such interest in a new product.

www.futureofbusiness.info/revolutionary.../comment-page-1/ - *Cached* -

[Special Communications The Surgical Journal of the Future: How...](#)

by RK Tompkins - 2006 - *Cited by 2* - [Related articles](#)

Not since the invention of the printing press in 1440 by Johannes Gutenberg has there been such a revolution in the methods of dissemination of knowledge ...

www.springerlink.com/index/U07670R402825851.pdf -

[The University of California College Prep Initiative "UCCP..."](#)

(BUSINESS WIRE)—March 20, 2000 Not since the invention of No-Doze(tm) has a product been so clearly designed to ... TurboGrad Levels the College Prep ...

www.allbusiness.com/media-telecommunications/.../6001534-1.html - *Cached* -

[What Good is a Chocolate Mold Machine](#)

Not since the invention of the chocolate press (which allowed solid chocolate in the first place) and the chocolate conching machine (which grinds up the

looking back

two aspects

a. looking back to look forward

"not since the invention of ..."

who said

"not since Gutenberg invented the printing press more than 500 years ago, making books and scientific tomes affordable and widely available has any new invention empowered individuals ... as profoundly as ..."

about what?

b. looking back to see how well earlier predictions did and where they went right or wrong

looking back



Francis Bacon
1561-1626



Thomas Carlyle
1795-1881

"Printing, gunpowder and the compass ... whence have followed innumerable changes, in so much that no empire, no sect, no star seems to have exerted greater power and influence in human affairs than these **mechanical** discoveries."

Francis Bacon, *Novum Organum*, 1620

"He who first shortened the labor of copyists by device of movable types was disbanding hired armies, and cashiering most kings and senates, and creating a whole new **democratic** world: he had invented the art of printing."

Thomas Carlyle, *Sartor Resartus*, 1833



looking forward

The New York Times

run of the mill predictions

YouTube may be changing the political process in more profound ways, for good ...

In statements to the press, the company has been quick to take credit for radically altering the political ecosystem

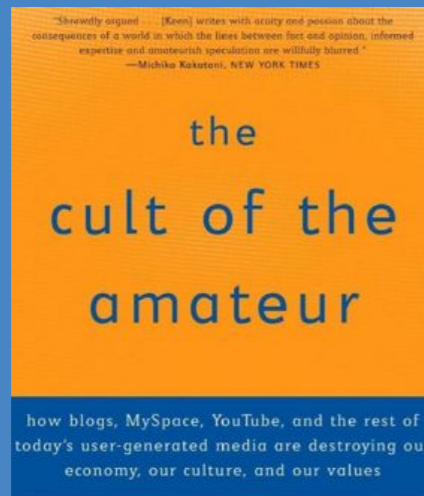
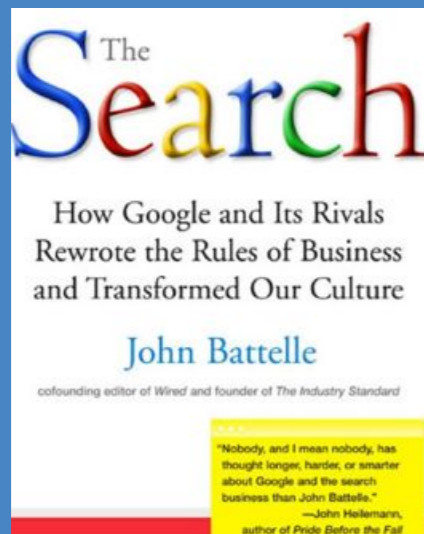
hedging

Some political analysts say that YouTube could force candidates to stop being so artificial ...

others see a future where politicians are more vapid and risk averse than ever.



bending your mind



"When technology shifts, it bends the culture"
Kevin Kelly, "Becoming Screen Literate,"
New York Times 2008

John Battelle, *The Search: How Google and Its
Rivals Rewrote the Rules ...
and Transformed our Culture*, 2005

Andrew Keen, *The Cult of the Amateur: How
Today's Internet is Killing our Culture*, 2006



we conform?

Chicago World's Fair, 1933:



"Science Explores,
Technology Executes,
Man Conforms"



man conforms



H.G. Wells
1866-1946

"And for the rest, those swarms of black, and brown, and dirty-white, and yellow people, who do not come into the new needs of efficiency?

Well, the world is not a charitable institution, and I take it they will have to go. The whole tenor and meaning of the world, as I see it, is that they have to go.

H.G. Wells, *Anticipations*, 1901

2. what's attractive

clear causality

clean history/futurism

i. someone invents x, and y results

hopeful history/futurism

ii. the invention of x led to us and that's progress

"whiggish" history

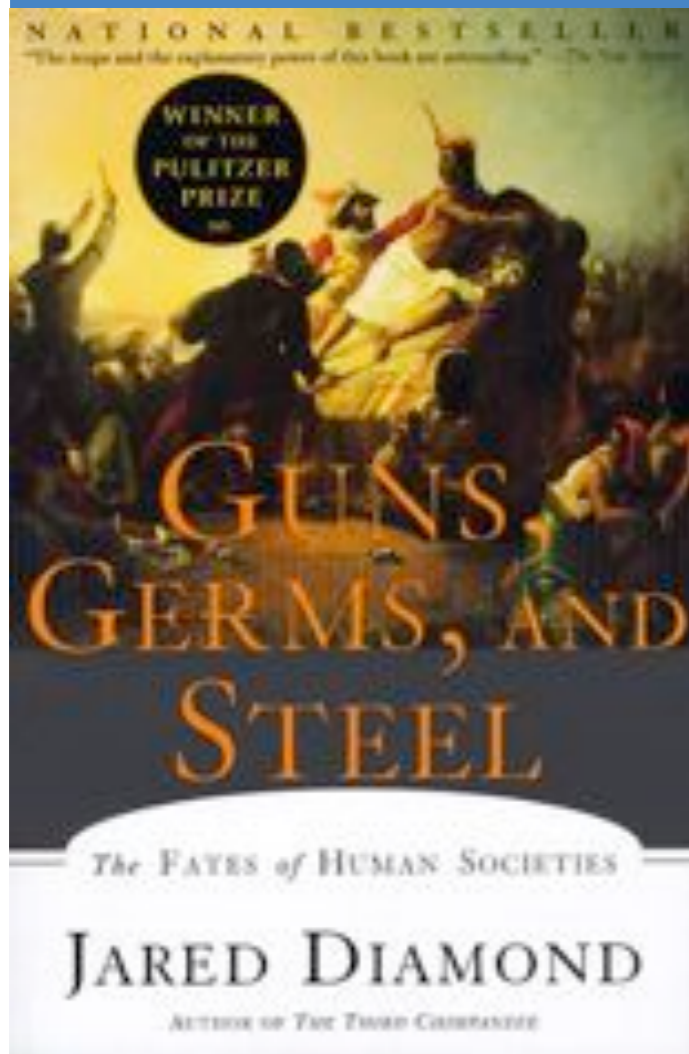
"The ratification if not the glorification of the present."

Herbert Butterfield,
The Whig Interpretation of History, 1931

what's
attractive?



clean and simple



Wired blog:
10 gadgets that changed the world





hopefully

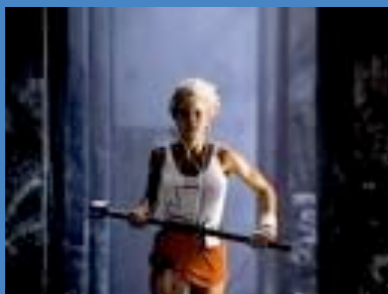
**predicting (wishing?)
with technology**

"We are in the midst of a technological,
economic, and organizational
transformation that allows us to
renegotiate the terms of freedom, justice,
and productivity."

Yochai Benkler. *The Wealth of Networks:
How Social Production Transforms Markets
and Freedom*, 2006



holding up?



Guy Kawasaki... one of those originally responsible for marketing the Macintosh.

"The first time I saw the Mac, it was a religious experience. The angels started singing and the scales were removed from my eyes," he said.

"This was a machine that worked the way you expected it to work. **We believed we would make people more creative and more productive and believed we were preventing world domination in the 1984 Orwellian sense by IBM.**"

[<http://news.bbc.co.uk/2/hi/technology/7841208.stm>]



confronting the facts

Solow's productivity paradox

"[W]hat everyone feels to have been a technological revolution, a drastic change in our productive lives, has been accompanied everywhere, including Japan, by a slowing-down of productivity growth, not by a step up. You can see the computer age everywhere but in the productivity statistics."

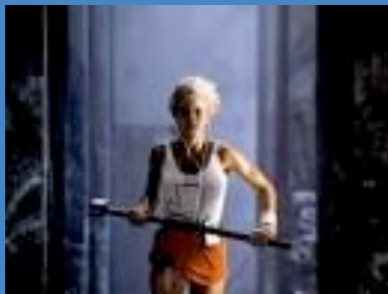
Robert Solow, "We'd Better Watch Out,"

New York Times, 1987, July 12

what's
attractive?



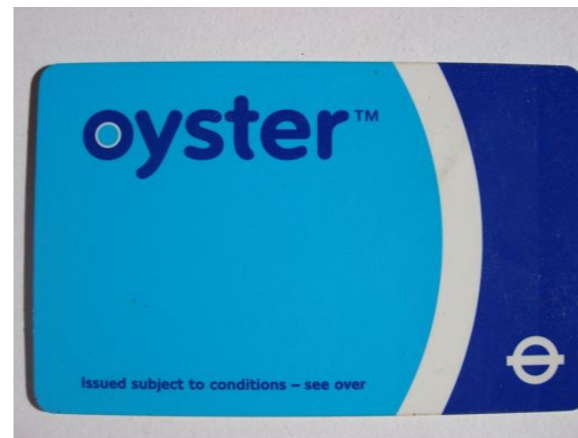
not so sure



"We cannot say whether the society of the computer will give us the latter-day capitalist or the commissar, but it will give us the technician and the bureaucrat.

... towards a much greater degree of organization and control."

--Heilbroner



what's
attractive?



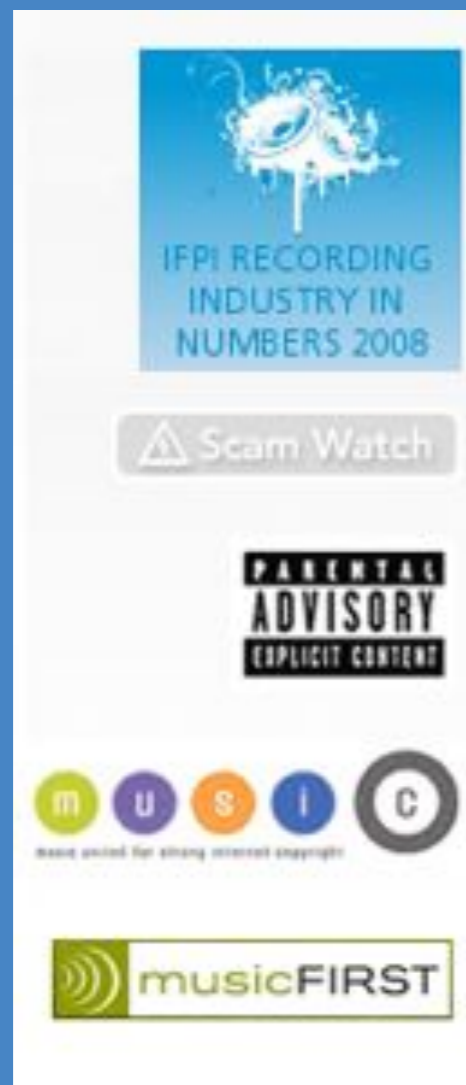
direction undetermined

"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way."

what's
attractive?



all going direct to heaven ...



"Universal access to the world's written knowledge [whereby] any digital work *could* be made available for experiencing to anyone, anytime, anywhere in the world .. the dream of universal access to *quality* digital works dangles just beyond reach."

Mark Stefik, "Letting Loose the Light," 1995

what's
attractive?



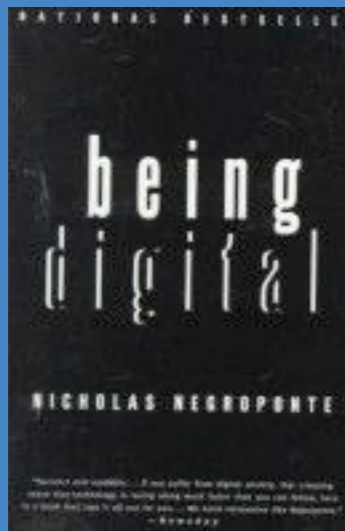
all going direct the other way



"We have locked up most of twentieth -
century culture and done it in a
particularly inefficient and senseless way."

James Boyle, *The Public Domain*, 2008

wishful thinking?



"Making just that enormous body of knowledge and wisdom accessible to young minds could close the generation gap with a few keystrokes."

Nicholas Negroponte, *Being Digital*, 1995

"One can predict that in a few more years, millions of schoolchildren will have the personal services of a tutor as well-informed as Aristotle."

Patrick Suppes, *Scientific American*, 1966



more prosaic



Donald Davies
1924-2000

- numerical computation
- editing and typesetting
 - design services
- availability of goods for sale
 - ordering of goods
 - booking of transport
 - banking
- remote access to national records
 - betting

Donald Davies, "Proposal for the
Development of a National
Communication service for on-line
Data Processing," 1965

technological sublime



"Westward the
course of
empire takes
its way."

"the rhetoric of the technological sublime"
Leo Marx, *The Machine in the Garden*, 1964





wishful thinking?

"Ye Gods, annihilate but space and time,
And make two lovers happy."

1728



confronting history

what and when?

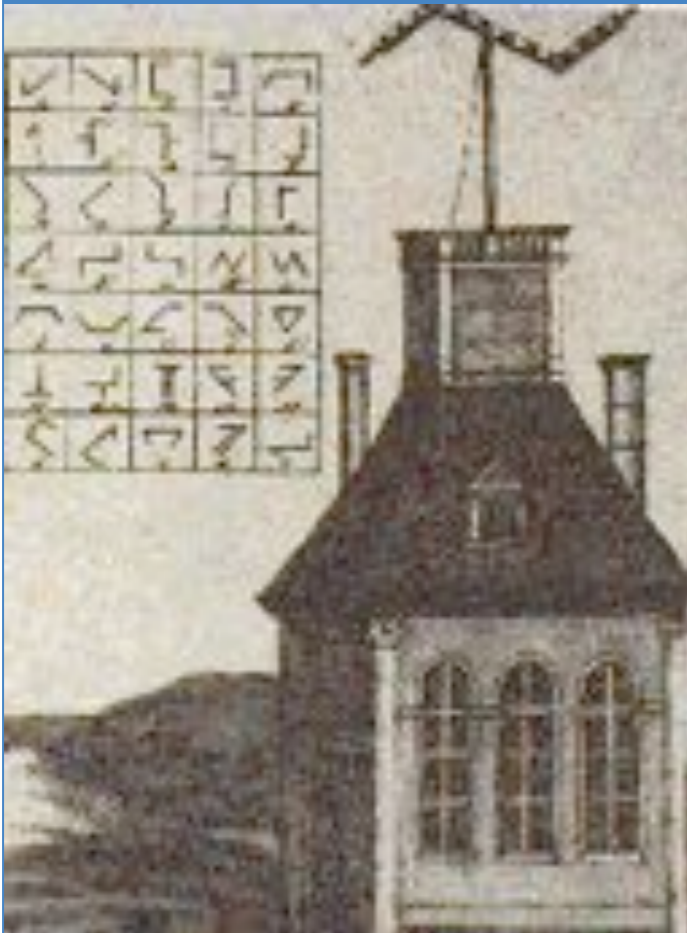
"at bottom, this invention might suffice to make possible the **establishment of democracy among a large population ... no reason why it would not be possible for all the citizens of France to communicate their will ... in such a way that this communication might be considered instantaneous."**



confronting history

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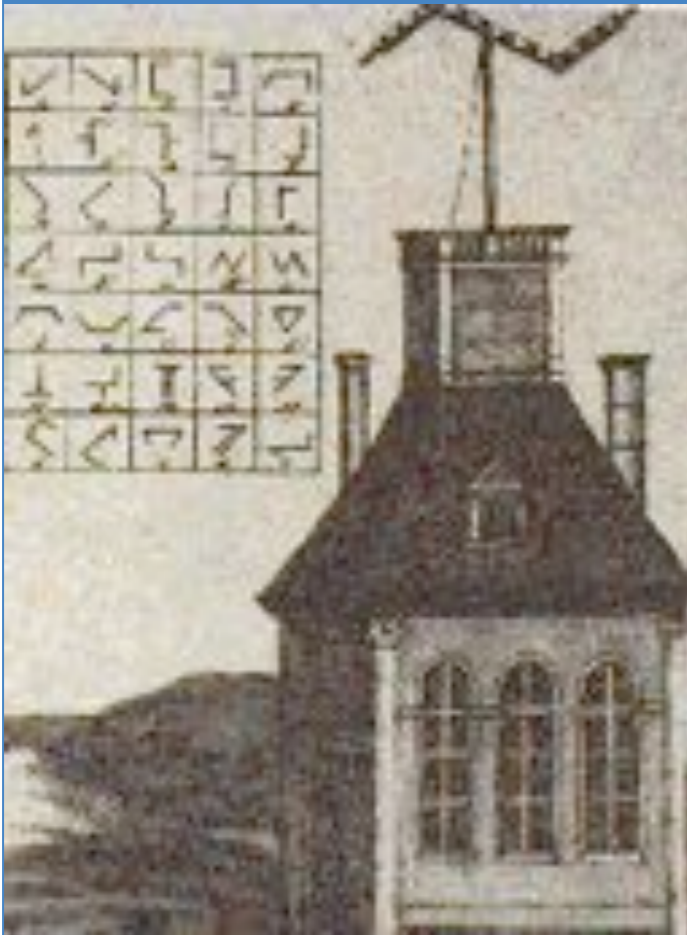


confronting history

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Alexandre Vandermond, 1795



Chapitre 1^{er}

Exposition.

Parvenu à la suite de travaux longs et pénibles, à trouver, enfin, un art nouveau regardé comme impossible par beaucoup de savans, une route nouvelle va fournir devant les efforts de l'homme, les distances vont disparaître et les extrémités du Monde se rapprocher.

Je crois devoir ^{comité} communique le résultat de mes travaux dans les archives, de l'industrie française, enregistres les efforts et les découvertes, et publier sous son et moyen un brevet d'invention pour authentifier mes travaux et mon invention résultant.

Conduire les Ballons dans l'air a été proclamé



Brevets d'Invention, de perfectionnement et d'importation, établis par les Lois des 7 janvier et 25 mars 1791.

Certificat de demande d'un Brevet d'Invention de cinq ans décerné à M. Duperron (français) à Paris département de la Seine

De la Requête de M. Duperron (français) adressée à la Cour Royale, département de la Seine, le 20 Mars 1832, dans laquelle il expose que, devant pour des droits de propriété temporaire accordés et garantis aux auteurs et importateurs des découvertes et perfectionnements en tout genre d'industrie, il demande un Brevet d'Invention de cinq ans, pour les procédés de son invention.

what & when?

"Parvenu à la suite de travaux longs et pénibles à trouver, enfin, un art nouveau regardé comme impossible par beaucoup de savans, une route nouvelle va fournir devant les efforts de l'homme, les distances vont disparaître et les extrémités du Monde se rapprocher."

French Patent Application, 5023, July 1832

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what & when?

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60 years on



"A line of telegraph ... from London to Kurrachee, and from thence to every part of India, ... intelligence and commands be daily and hourly communicated with the speed of lightening ... in this virtual annihilation of time and space in the communications between England and her distant possessions will be more than realised"

--*Blackwood's Edinburgh Magazine*, 1857



what and when?

"The progress of human knowledge has accomplished within a century revolutions in the character and condition of the human race so beautiful and sublime as to excite in every observing mind feelings mingled with the deepest admiration and astonishment. No age has illustrated so strongly as the present the empire of mind over matter and the ability of man to rise ... above obstacles with which nature has surrounded him. ... It is a happy privilege we enjoy of living in an age, which for its inventions and discoveries, its improvement in intelligence and virtue, stands without a rival in the history of the world ... Look at our splendid steamboats."



what and when?

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--*Scientific American*, 1841



what and when?

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the scientific american tradition



"And the Iron Horse, the earth-shaker, the fire-breather, which tramples down the hills, which outruns the laggard winds, which leaps over the rivers, which grinds rocks to powder and breaks down the gates of the mountains, **he too shall build an empire and an epic. Shall not solitudes and waste places cry for gladness at his coming?**"

--*Scientific American*, 1849



sea to shining sea



"the almost complete annihilation of time and space between the distant antipodal points of the American continent ... produced by the construction of the Pacific Railroad"

John Wesley Clampitt,
Echoes from the Rocky Mountains, 1888



America sublime

"Making a better
machine cannot make
men better."

Emile Zola
La Bête Humaine,
1890

"Objects of exalted power and grandeur
elevate the mind that seriously dwells on
them, and impart to it greater compass and
strength. Alpine scenery and an embattled
ocean deepen contemplation, and give their
own sublimity to the conceptions of
beholders. The same will be true of our
system of Rail-roads. Its vastness and
magnificence will prove communicable **and add
to the standard of the intellect of our
country.**"

New England Magazine 1832



coming soon

telephone

airplane

radio

television

...

the Apple tablet???



one more

"When I was a student, half a century ago, we used to talk of the abolition of distance, because of those then comparatively recent triumphs, the telegraph, the steamship, and the railway train. Some of us knew already of the possibility of the radio, but nobody believed we should live to take a ticket and fly around the world. ... television seemed a complete impossibility ... All my life I have seen the abolition of distance becoming more and more complete."

H.G. Wells, "Wanted--Professors of Foresight," 1932



nuclear sublime

too cheap to meter?

"nuclear domestic power packs leading to a social revolution in our own time, a society without class, privilege, cities, nations or geographical boundaries ... **a single, uniformly spread community, sharing as neighbors the whole surface of the earth.**"

R.M. Langer, 1940.



electrical sublime

"Electric circuitry has overthrown the regime of 'time' and 'space' and pours upon us instantly and continuously concerns of all other men. It has reconstituted dialogue on a global scale. Its message is Total Change, ending psychic, social, economic, and political parochialism. . . . Ours is a brand-new world of allatonceness. 'Time' has ceased, 'space' has vanished. **We now live in a *global village* . . . a simultaneous happening."**

Marshall McLuhan et al., *Medium is the Message*, 1967



electrical sublime

"After three thousand years of explosion, by means of fragmentary and mechanical technologies, the Western World is imploding, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time ... **we approach the final phase of the extensions of man--the technological simulation of consciousness.**"

Marshall McLuhan, *Understanding Media*, 1964



1889

Marks of time:

electric shoe

electric flour

electric cough

lozenges

electric velveteens

electric confectionary



Graham's Celestial Bed

heard this before

"... this age of ours ... when the pulsations of electricity vibrate and throb around this earth, uniting nations as one family by those powerful yet sensitive bonds wrought by science and riveted by man's quenchless thirst for still higher and better achievements."

Morris S. Wise,
Trade-marks and Trade-mark Law, 1898



fiber sublime



"[Broadcast] serves only to remind us how bound and gagged we are--how tied to the limits of time and space that angels travel in an instant ..."

"anyone can transmit any amount of information, any experience, any opportunity to anyone or everyone, anywhere, at any time, instantaneously, without barriers of convenience or cost, the resulting transformation becomes a transfiguration. **The powers it offers us bring us back to the paradigms of paradise.**"

-- George Gilder, *Telecosm* 2002



raising the bar

"The singularity is technological change so rapid and so profound that it represents a rupture in the fabric of human history. Some would say that we cannot comprehend the singularity."

-Ray Kurzweil, <http://www.kurzweilai.net/>



net sublime



"We are as Gods, and might as well get good at it."
Stewart Brand, *Whole Earth Catalogue*



determined mistakes

necessary vs sufficient

new vs old

technology vs institution

constraint vs resource

getting your history wrong

generalizing from a limited case

faulty causality

getting your future wrong



determined mistakes

necessary vs sufficient

"Is industrial technology the necessary and sufficient condition for capitalism?" - Heilbroner

going soft?

the handmill produces feudalism?

couldn't have feudalism without handmill?

once the handmill was superseded, feudalism was in trouble?



determined mistakes

There are persons who can write not illegibly in pencil, but are as enigmatical as Rufus Choate or Horace Greeley when they take up the pen. There are persons too lazy to resort to ink and pen who can conquer their besetting sin enough to make a few dabs with a pencil. Living must have been more laborious before the pencil age. Blue pencil, red pencil, what should we do without them? Yet writing with one's own hand seems to be disappearing, and the universal typewriter may swallow all. Librarians of a century or two hence may be searching for the last reference to pencils.

New York Times 1938

the new vs the old





determined mistakes

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New York Times 1938

the new vs the old





determined mistakes

technology vs institution



Grandfather:
Well, I finally finished my
doctoral thesis.



Woman:
Way to go, [George](#).



Grandfather:
Did my research at
[Indiana University](#).

Woman:
[Indiana?](#)



Grandfather:
Yep. 1996 took the
school's library...and
digitized it. So I could
access it over the Internet.

She asks her [son](#) to take
the call in.



Grandfather:
You know... it's a great time
to be alive.



Tag:
IBM. Solutions for
a small planet.

how to
thing about
td



It didn't take much vision to figure out that unlimited perfect copyability, with global reach and at zero marginal cost, was slowly transforming the printing press into a latter-day steam engine. And once that became obvious, we said so, over and over again, all the time. We said it in public, we said it in private. We said it when newspapers hired us as designers, we said it when we were brought in as consultants, we said it for free. We were some tiresome motherfuckers with all our talk about the end of news on paper. And you know what? The people who made their living from printing the news listened, and then decided not to believe us.

Clay Shirky, boingboing, Dec 2008

determined mistakes

constraint vs resource





determined mistakes

unintended consequences

superbugs

reindeer

moral hazard

seatbelts

naked streets



determined mistakes

unintended consequences

superbugs

reindeer

moral hazard

seatbelts

naked streets



determined mistakes

unintended consequences

superbugs

reindeer

moral hazard

seatbelts

naked streets



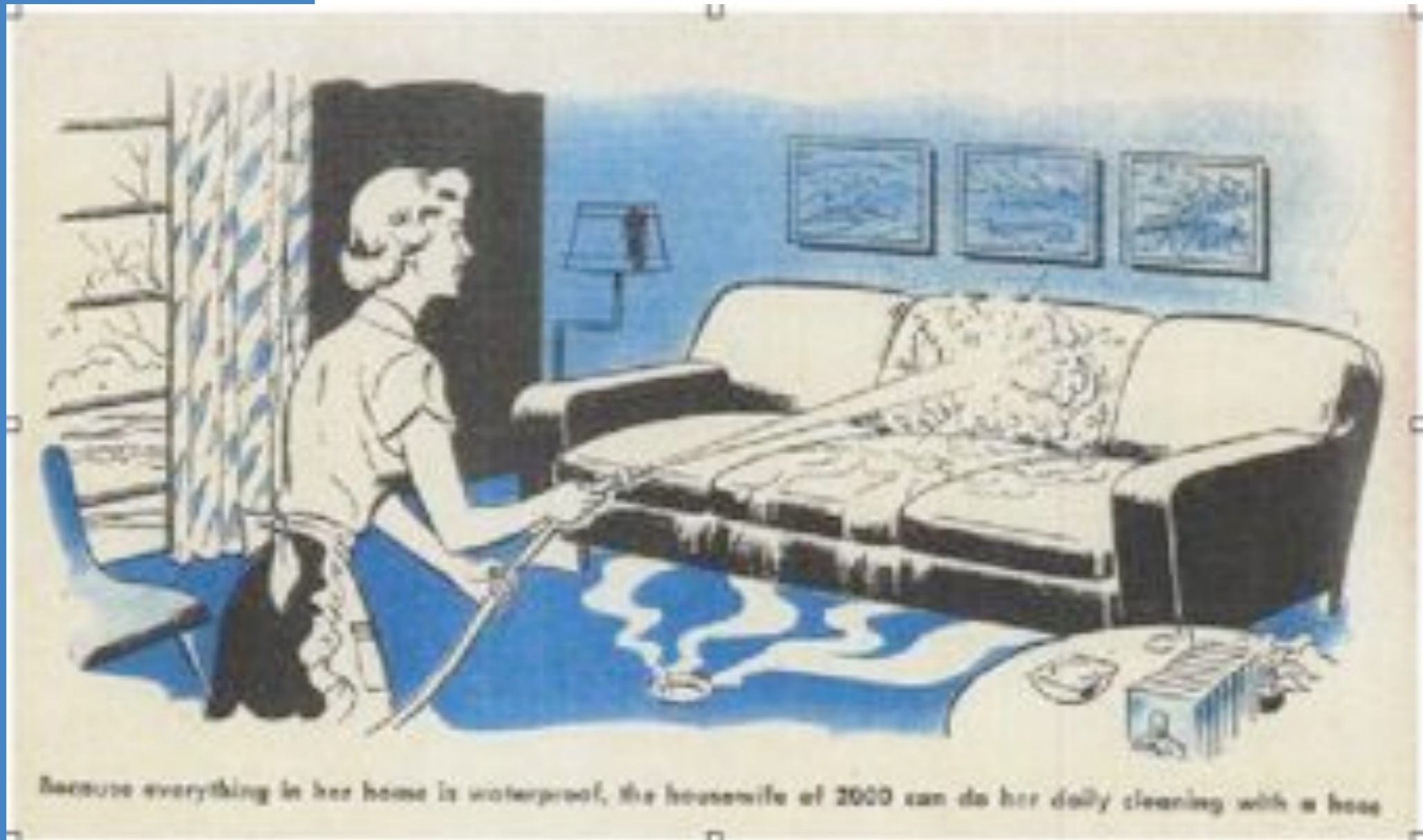
determined mistakes

getting your history wrong





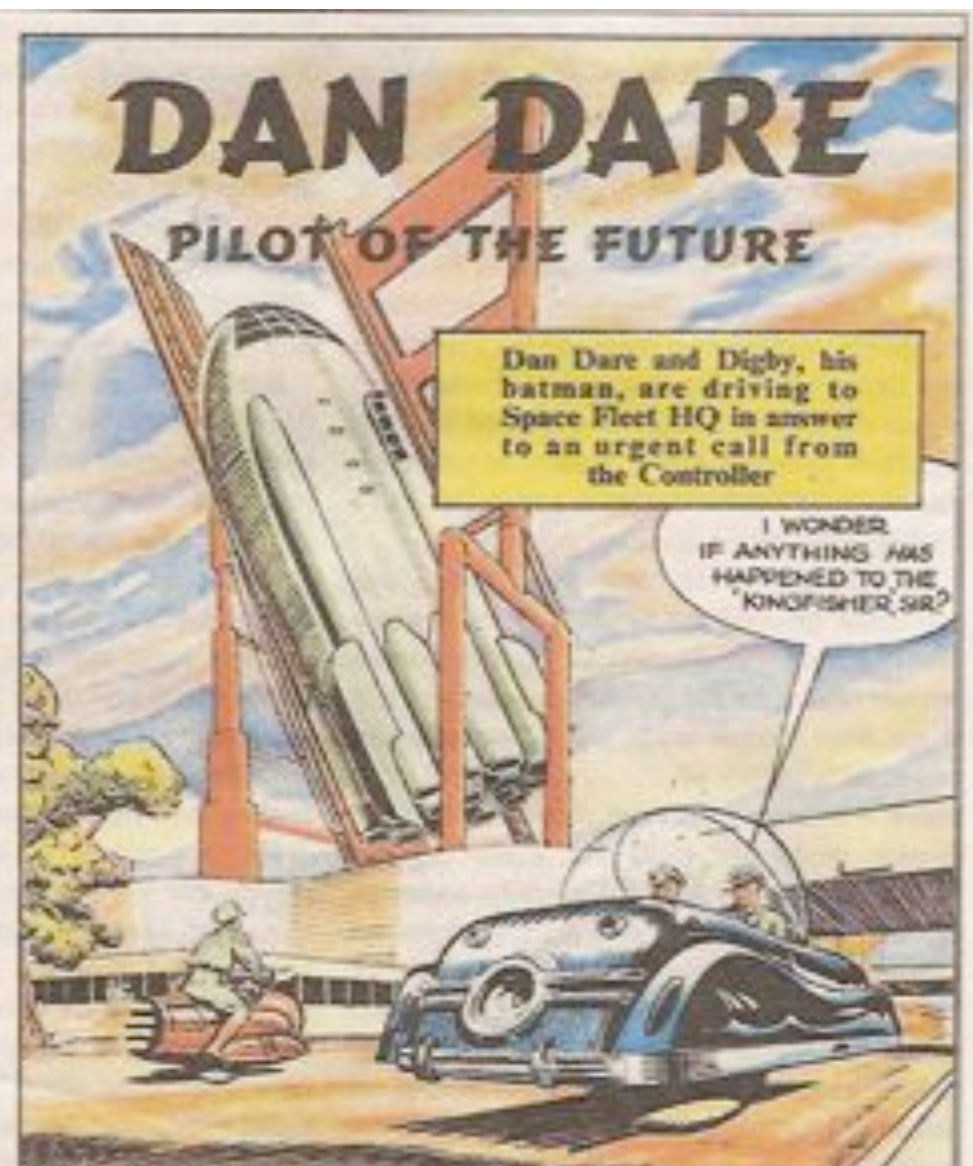
nunberg error



how to
thing about
td



nunberg error





determining questions

what happened?

what did (or didn't) come before?

what did (or didn't) follow?

what contributed?

what happened elsewhere?



ending

confronting determinism

1. what is technological determinism?
2. what's attractive about it?
3. examples old and new
4. how to think about it



next up

the technology that did change the world?

28 Jan: The First Technologies of Information: Writing Systems

reading

Required reading:

- Marshack, Alexander. 1999. "The Art and Symbols of Ice-Age Man," in David Crowley, ed. *Communication in History: Technology, Culture, Society*. Allyn & Bacon. Pp. 5-14
- Robinson, Andrew. 1999. "The Origins of Writing." In David Crowley, ed. *Communication in History: Technology, Culture, Society*. Allyn & Bacon. pp 36-42