

technological determinism

History of Information
January 25, 2011

aob

administrative issues?

waitlist cleared?

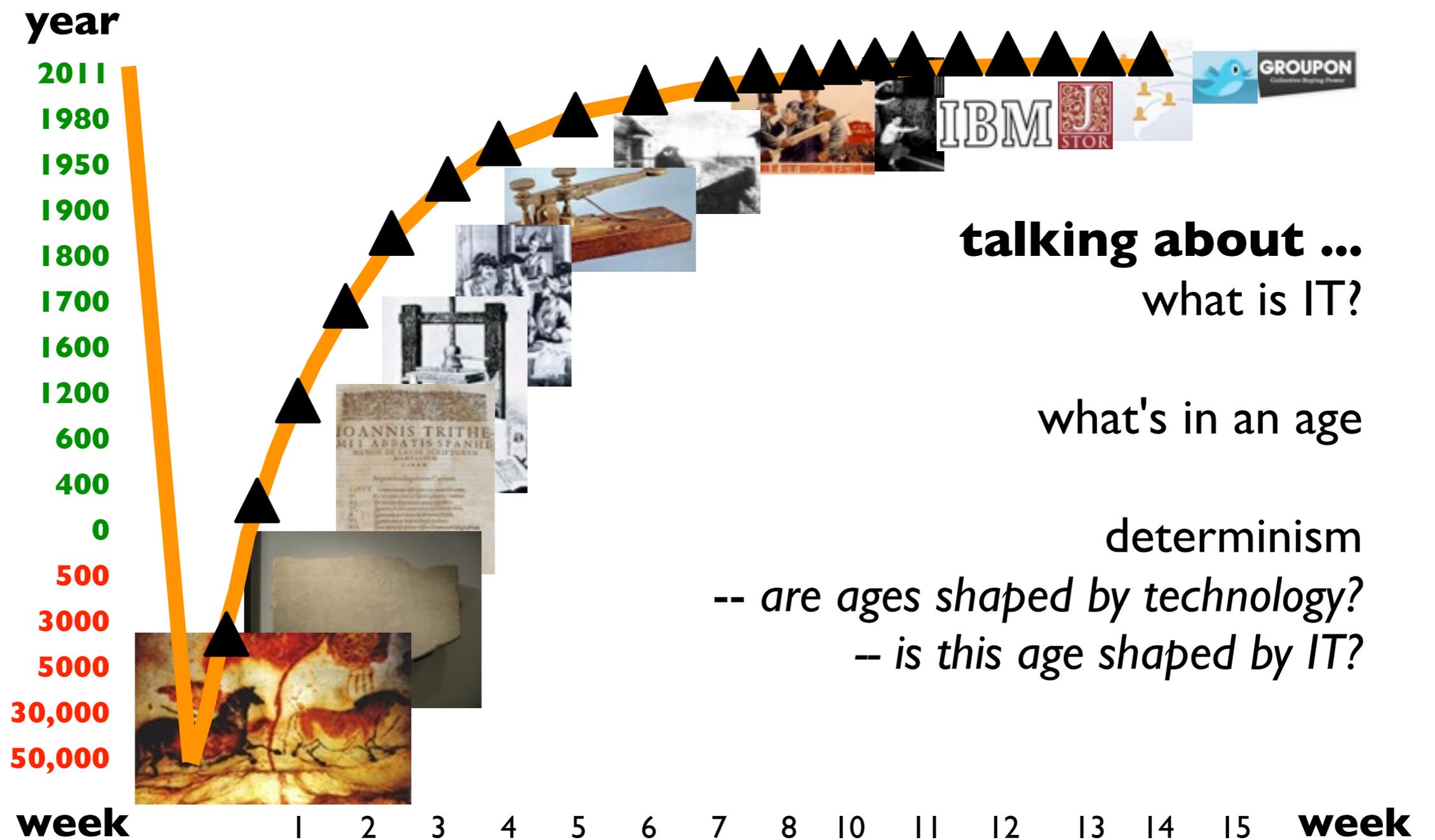
assignments

deadline

argument

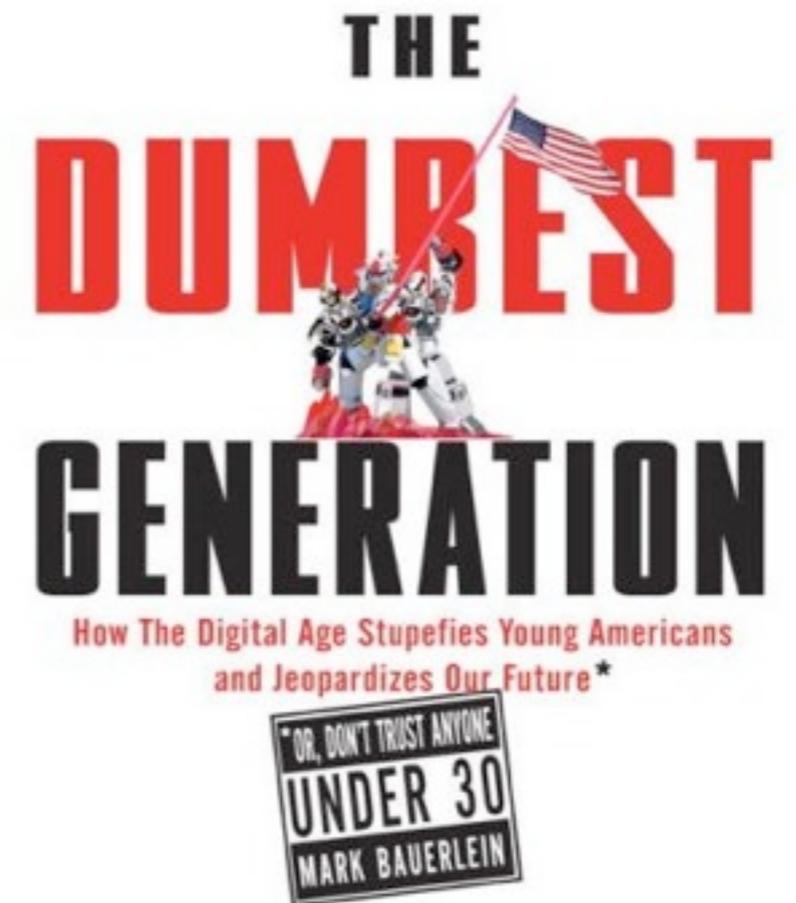
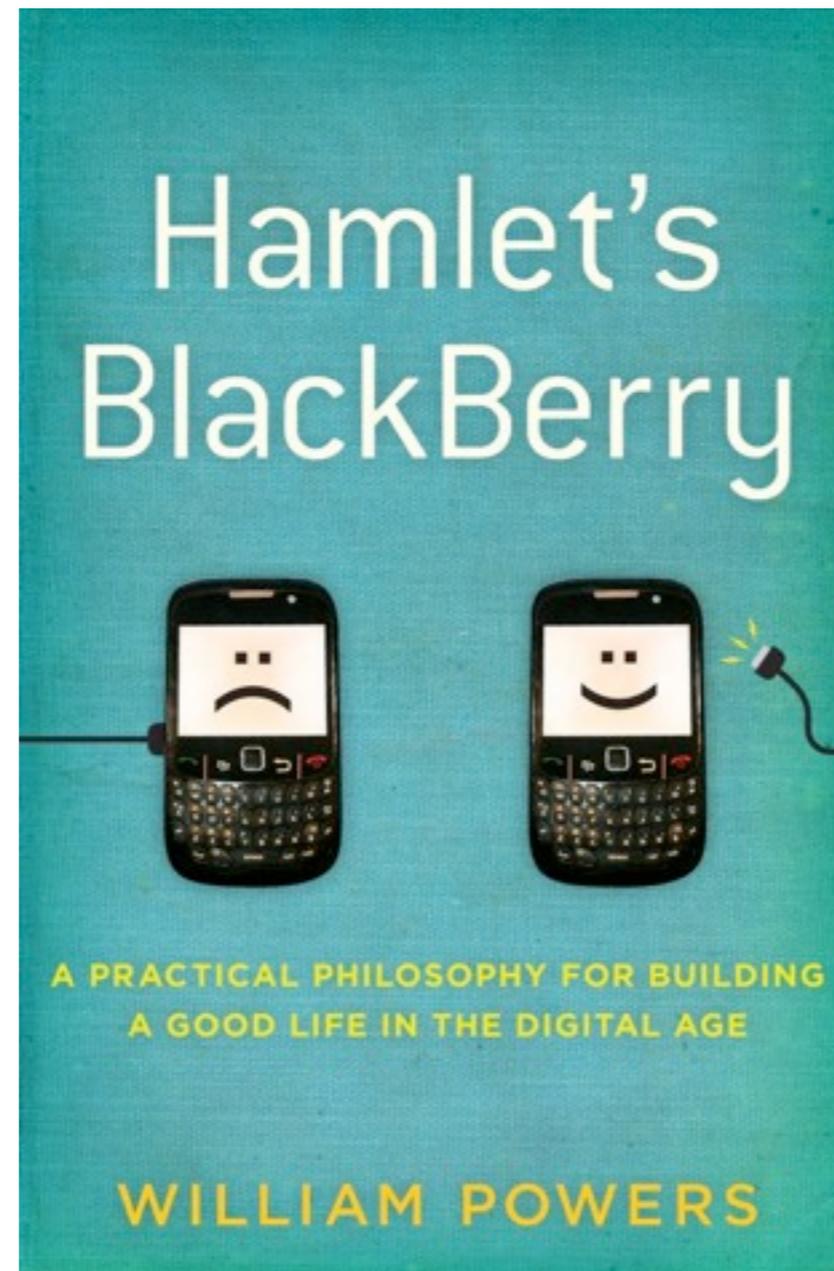
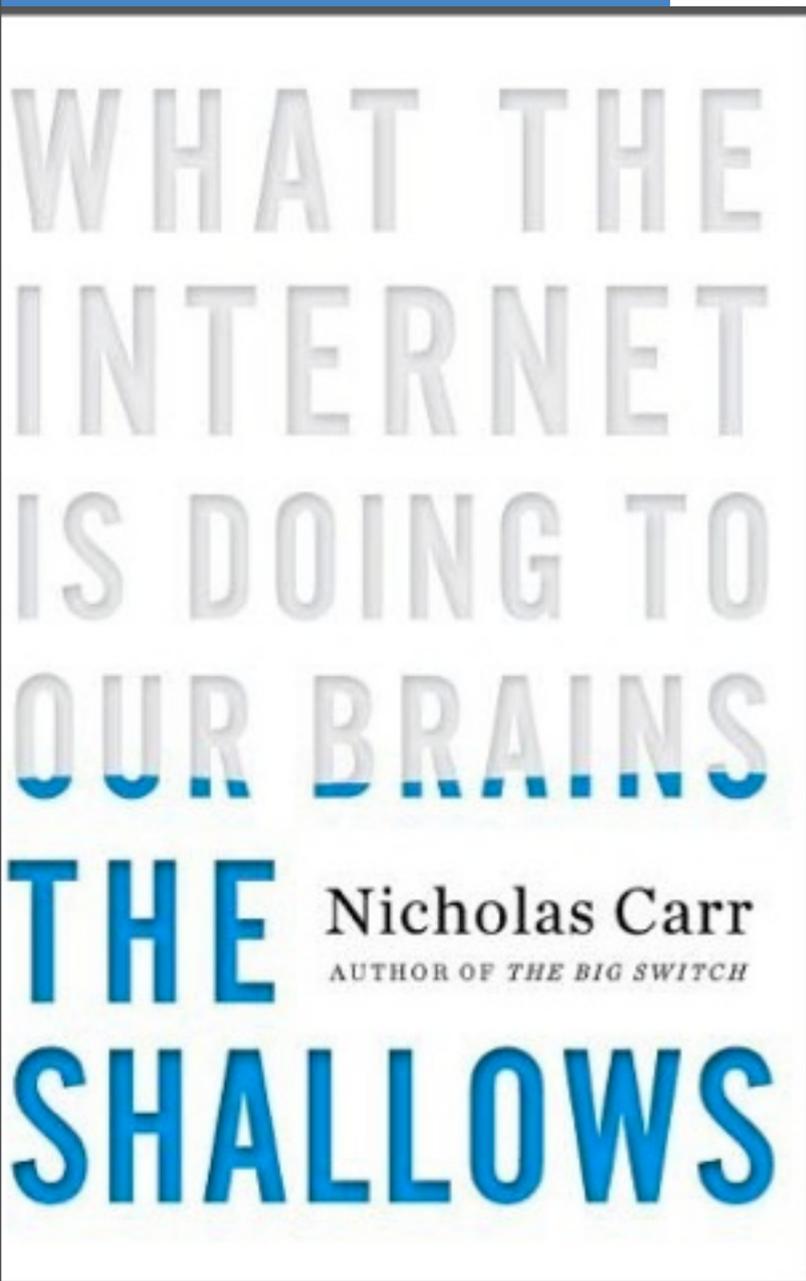
spelling, grammar, etc

where are we going?





going up or down?



overview

what is technological determinism?

taking sides

an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes

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*



Heilbroner's example



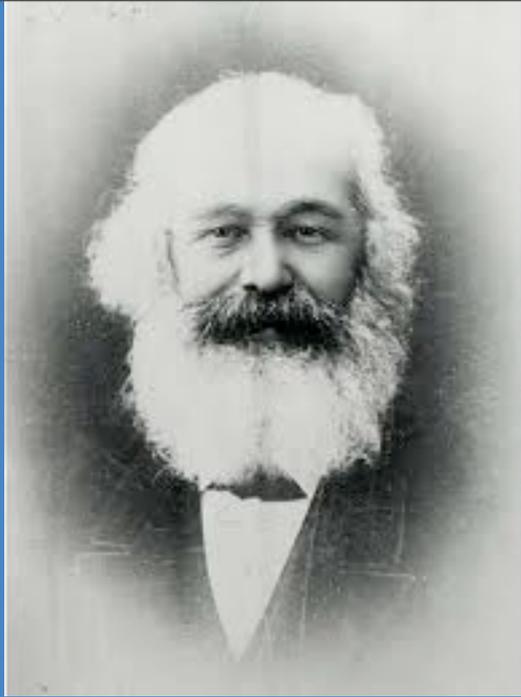
what history tells us

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

--Karl Marx



Hofl II -- determinism 7



Karl Marx
1818-1883

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



modern versions

"Kirkpatrick insists that for Zuckerberg, Facebook has never been about building an advertising platform. 'The idea that any of that is done for commercial reasons in order to advantage their opportunities to sell advertising, he considers insulting,' Kirkpatrick says. 'This is the Zuckerberg people really need to understand, the guy who is doing it to change the world, not to make money.'"

Time Newsfeed [<http://newsfeed.time.com/2010/06/08/>]

eg the technium

"The technium is evolution accelerated, so it is crammed with emergent self-created forms. These patterns have nothing to do with consciousness or awareness. They emerge in the dumbest systems sufficient complex to adapt. We call these forms inevitable, because like a spiral vortex in draining water, or snowflakes in a winter storm, they will manifest themselves whenever the conditions are right. But, of course, they never render themselves in the same details exactly." --Kevin Kelly

http://www.kk.org/thetechnium/archives/2009/08/progression_of.php

overview

what is technological determinism?

taking sides

an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes

taking sides

Heilbroner -- machines did it: 44%

Williams -- no they didn't: 35%



maybe; maybe not: 21%



determinist

Raymond Williams opposes the widely accepted view of the nature of social change known as technological determinism, where "new technologies are discovered... which then sets the conditions for social change and progress" (Williams, 13). On the other hand, Robert Heilbroner accepts this concept, illustrating his point with a passage by Karl Marx, "The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist." If the Internet is used instead of the television in Williams' nine examples for how television has altered our world, then I believe the arguments do become more convincing, thus proving Williams wrong. In the specific case of the Internet, Heilbroner's approach makes more sense because the Internet's development is on a sort of set course and seems to be "bounded by the constraints of knowledge and capability... a determinable force of the historic process" (Heilbroner, 340). While I would normally support William's belief that both technological determinism and symptomatic technology are not wholly accurate because they fail to consider intention in the process of research and development, for example, the development of new weaponry in response to warfare, Heilbroner would most likely agree that it is the Internet's profound impact that has determined and altered the nature of our current socioeconomic order. The internal process of research and development which led to the Internet was a determined path, yet the way the Internet is applied and used in people's daily lives is fundamentally a reflection of social influences.

-Elise

determinist

Williams argues that his nine definitions of the technologically deterministic television are "sterile" due to the fact that they abstract technology from society. If we instead consider the Internet, I believe his argument no longer holds. In particular, interpretations (iv) and (v) now carry more weight: Developed as a method of augmenting existing communications technologies, the Internet enabled intermingling, and therefore inherent changing, of various societies. The Internet (rather, ARPANET) did not grow out of isolation, but as a means to unify the existing but segregated networks and media of the world, and as such, cannot be considered a self-acting force; Heilbroner's view of incremental progress as a social activity more accurately fits the development of the Internet Protocol.

-Jon Ko

Hofl II -- determinism 14

anti-determinist

We can replace television and the internet with any technology in the first five examples, and they would still be accidental. We could put any other technology in the last four examples and they would still be symptoms of change in a society. Internet, like any other technology, is simply a result of change in society. So my view here is there is no such thing as technological determinism. Change makes technology, not the other way around. Heilbronner seems to argue against this view but in fact, some of his reasons actually support this idea of "symptomatic technology."

--Ha

anti-determinist

If we replace television with the Internet, Williams is still right about the relationship between technology and society. ... The light bulb wasn't created for no reason at all; there was a need for an everlasting light. Indeed many things can be an accident, but in each and every case there is a motivation to begin working. Heilbroner ignores this fact and in turn his analysis seems to fall short. His general claims about the relationship between technology and society cannot be directly applied to reality. It's almost as [if?] he has misunderstood Marx's idea, in a sense the steam-mill does give us society with the industrial capitalists, but the effect in [is?] two-fold. An innovation is created with intention and once perfected applied to an ever-changing world.

--Ramez

overview

what is technological determinism?

taking sides

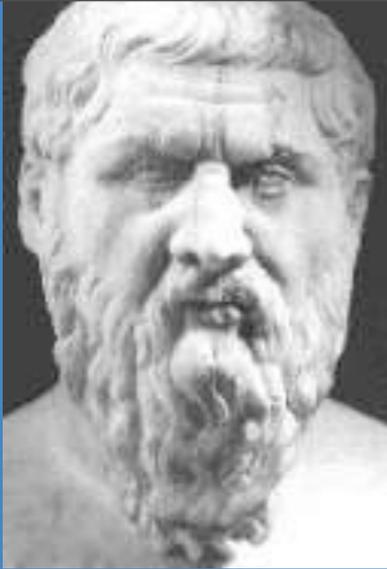
an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes



Plato
427-347 bce

an old idea

"Those who acquire [writing] will cease to exercise their memory and become forgetful; they will rely on writing to bring things to their remembrance by external signs instead of on their own internal resources."

Plato, *Phaedrus*, c. 370 bc

coming up:
manuscript culture

coming up:
print

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."

coming up:
print culture

Thomas Carlyle, *Sartor Resartus*, 1833

general argument

"When technology shifts, it bends the culture"

Kevin Kelly, "Becoming Screen Literate,"

New York Times 2008

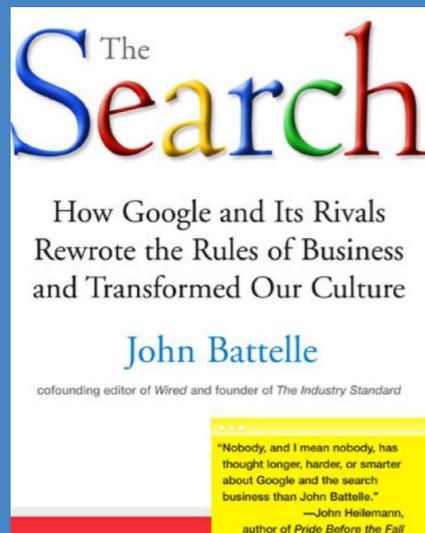
bends which way?



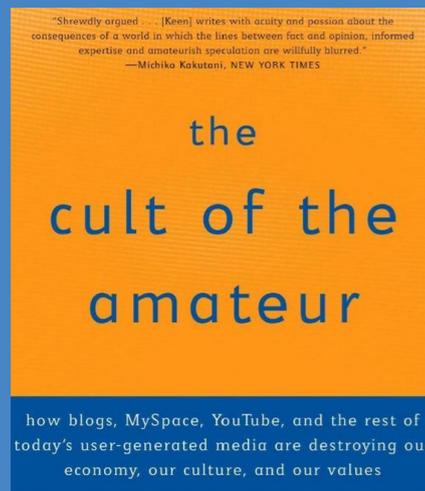
"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything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



different fight



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

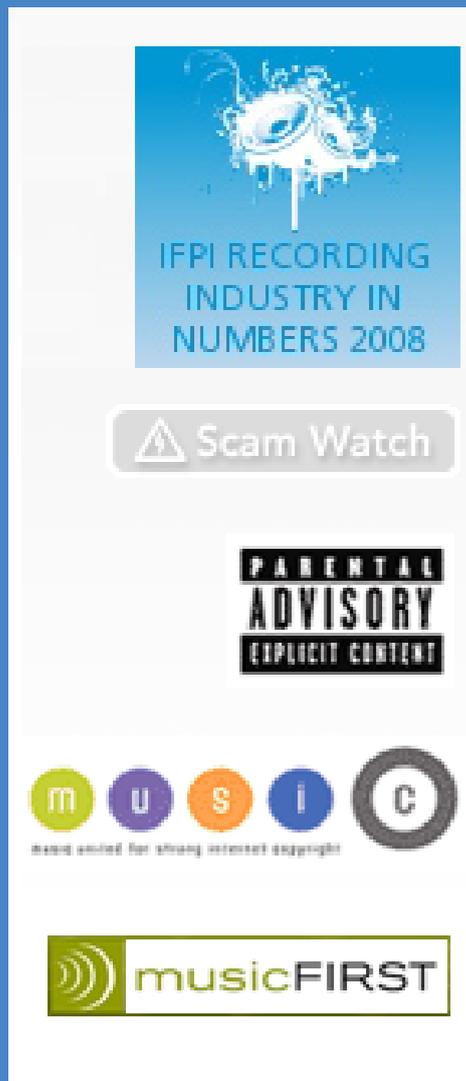


Andrew Keen, *The Cult of the Amateur: How Today's Internet is Killing our Culture*, 2006

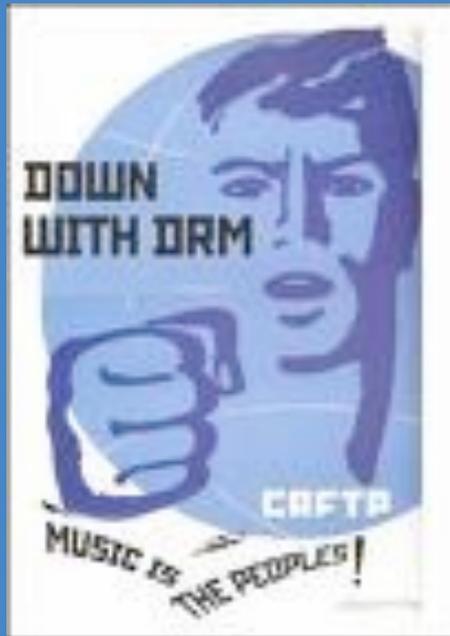
all going direct to heaven?

"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



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

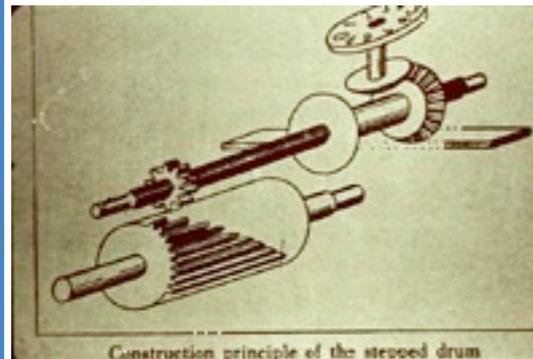


techies vs humanists?

an early battle?



Gottfried Leibniz
1646 - 1716



Leibniz vs Voltaire

"the best of all possible worlds"



Voltaire
1646 - 1778

CANDIDE,
OU
L'OPTIMISME,
TRADUIT DE L'ALLEMAND
DE
MR. LE DOCTEUR RALPH.



MDCCLIX.

**anticipating
digital Panglossians?**

overview

what is technological determinism?

taking sides

an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes

educational promises

"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

you should be so lucky

"Children in the public schools will be taught practically everything by moving pictures. Certainly they will never be obliged to read history again."

D.W. Griffith

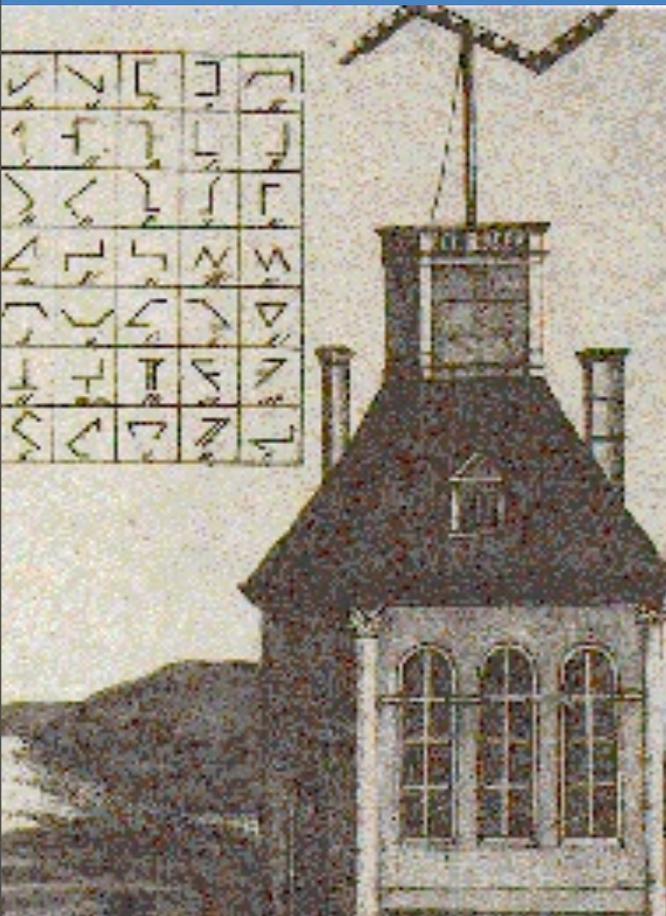


a grand future

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."

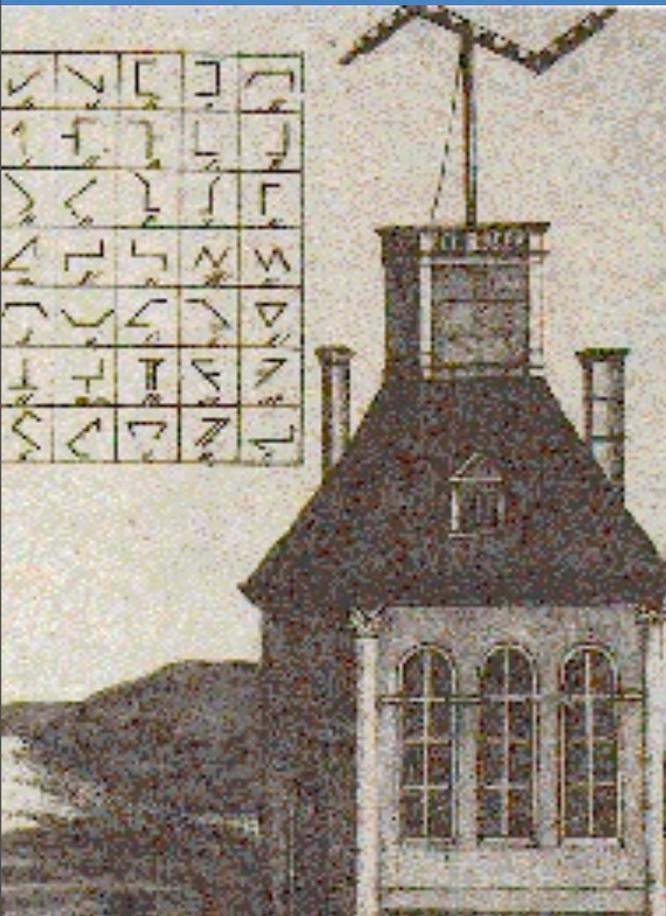
a grand future



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.**"

a grand future



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.**"

Alexandre Vandermond, 1795

Chapitre 1^{er}

Exposition.

Parvenu à la suite de travaux longs et pénibles, 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 ^{consigner} le résultat de mes travaux dans les archives, où l'industrie française, encouragée par l'effort et ses découvertes, et sublimée par ses succès et moyennant un brevet d'invention pour constater mes travaux et mes découvertes, résultats.

Conduire les Ballons dans l'air a été proclamé -

Duperron

Perostats.



Brevets d'Invention,
de perfectionnement et d'importation,

établis par les Lois des 7 janvier et 25 mai 1791.

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

Par la Requête de M. Duperron (fr. de la S.) assésé à
la Cour Royale, demeurant à Paris, Rue de la Harpe N° 100,
dans laquelle il expose que, devant pour des droits de propriété temporaire
accordés et garantis aux auteurs et inventeurs des découvertes et perfectionnements en
tout genre d'industrie, il demande un Brevet d'Invention

de cinq ans, pour tout le monde dans la République,

still grand?

"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.**"

Chapitre 1^{er}

Exposition.

Parvenu à la suite de travaux longs et pénibles, 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 ^{consigner} le résultat de mes travaux dans les archives, où l'industrie française, encouragée par l'effort et ses découvertes, et sublimée par ses succès et moyennant un brevet d'invention pour constater mes travaux et mes découvertes, résultats.

Conduire les Ballons dans l'air a été proclamé -

Duperron

Perostats.



Brevets d'Invention,
de perfectionnement et d'importation,

établis par les Lois des 7 janvier et 25 mars 1791.

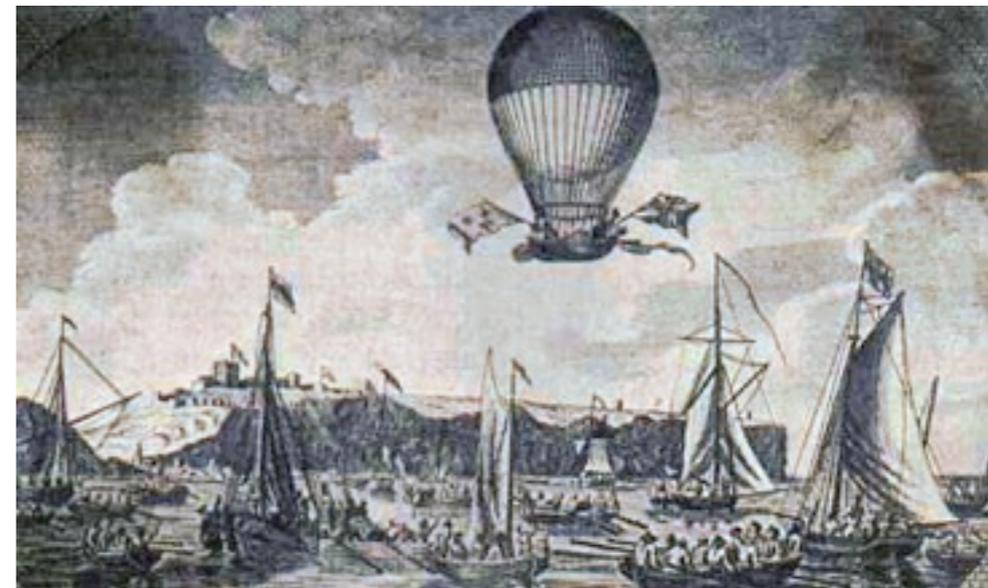
Certificat de demande d'un Brevet d'Invention
de cinq ans décerné à M. Duperron (franc. L. 1)
à Paris département de la Seine

Qu la Requête de M. Duperron (franc. L. 1) soumise à
la Cour Royale, département de la Seine, le 20. Br. L. 100,
dans laquelle il expose que, devant pour des droits de propriété temporaire
accordés et garantis aux auteurs et inventeurs des découvertes et perfectionnements en
tout genre d'industrie, il demande un Brevet d'Invention

de cinq ans, pour tout à rendre dans les brevets.

still grand?

"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."

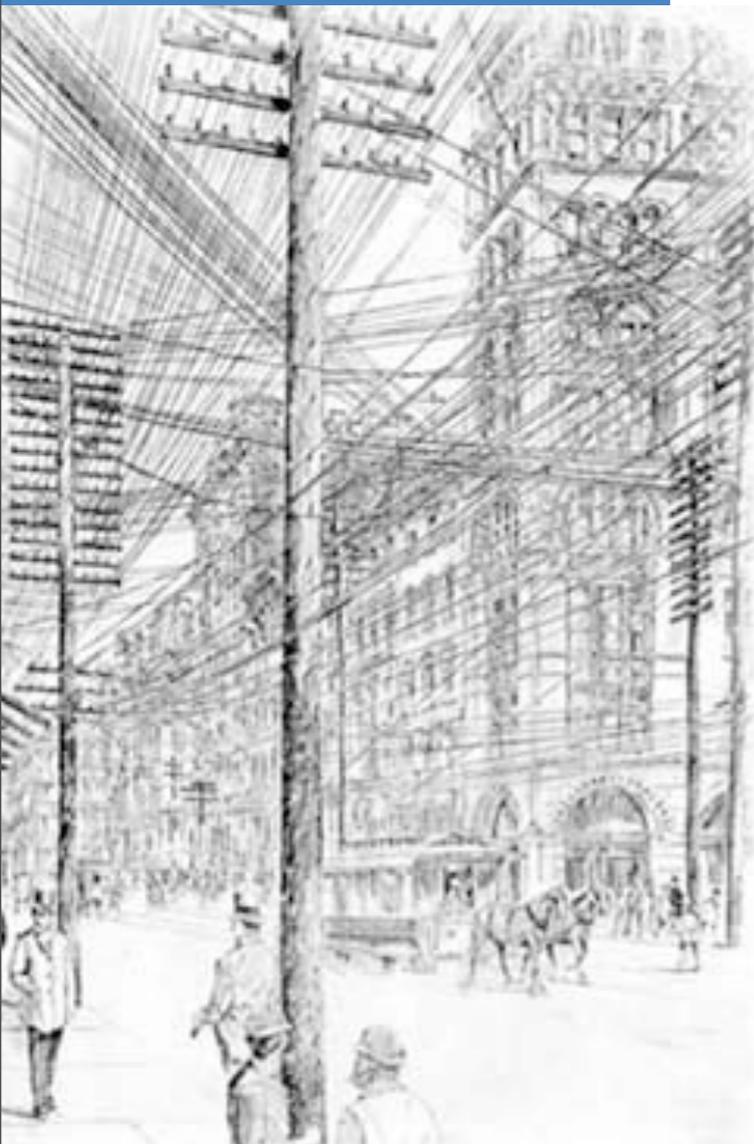


wishful thinking?

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

1728

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

--*Scientific American*, 1841

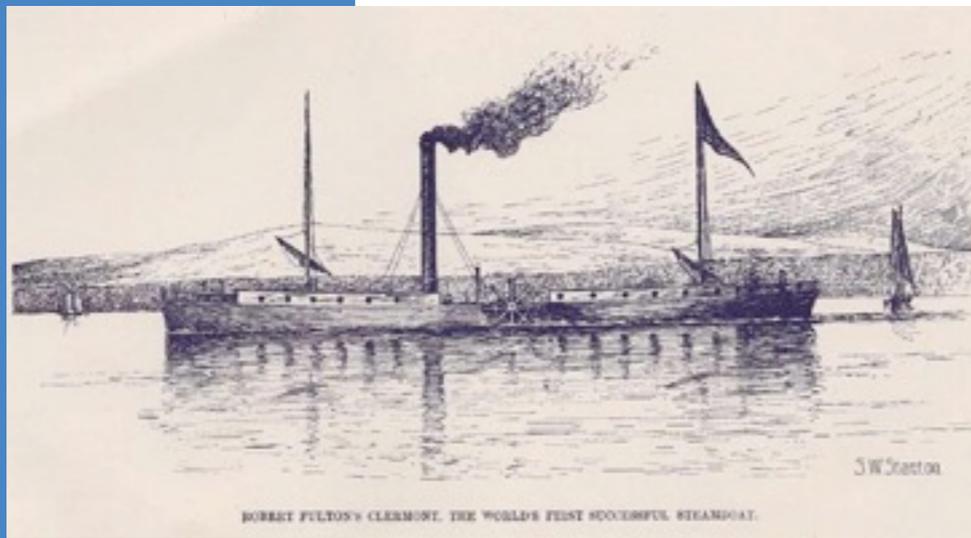
Hofl II -- determinism 33

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."

--*Scientific American*, 1841

Hofl II -- determinism 33



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."

--*Scientific American*, 1841

Hofl II -- determinism 33



the scientific american tradition



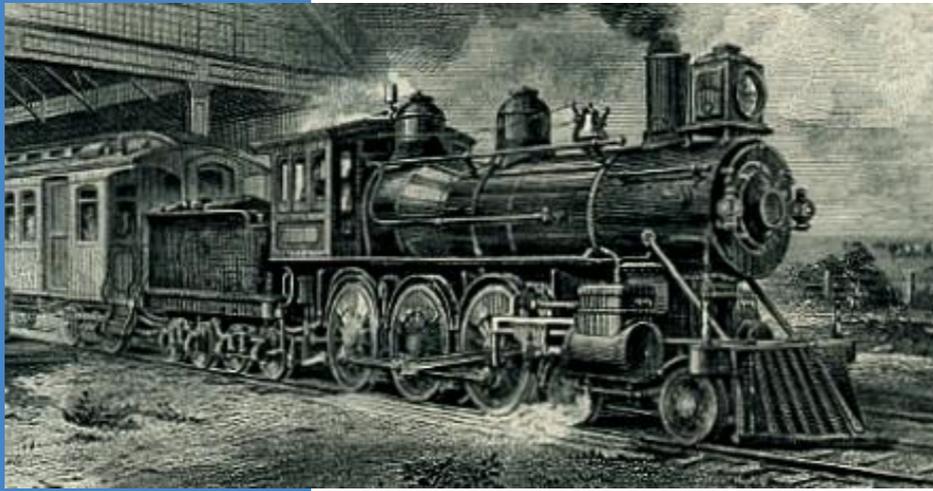
"And the Iron Horse, the earth-shaker,
the fire-breather, which tramples down
the hills, which outruns the laggard
winds, which leaps over the rivers,
which grinds rocks to powder and breaks
down the gates of the mountains, **he too
shall build an empire and an epic.
Shall not solitudes and waste places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

"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



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

overview

what is technological determinism?

taking sides

an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes

what's attractive

... looking back

... looking about

... looking forward

looking back

we are the product of progress

"Westward the course of empire takes its way"



Hofl II -- determinism 41

looking back

we are the product of progress

"Westward the course of empire takes its way"

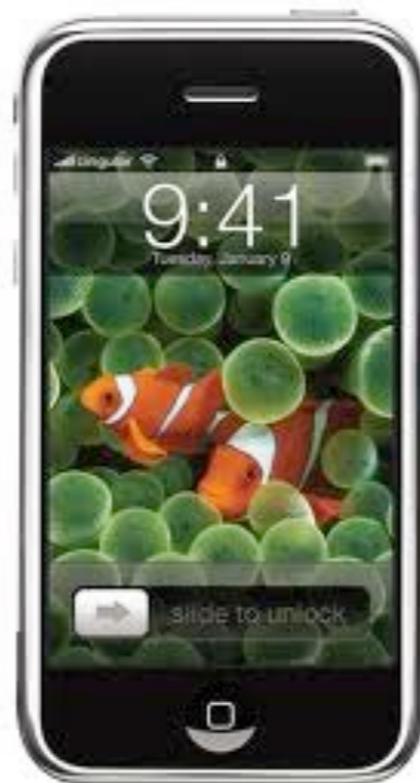


looking about

machines measure progress

from religious superiority
to technological superiority

Michael Adas, *Machines as the Measure of Man*, 1989



"advanced"

"un/less/developed"

self-deception?

looking forward

if it got us here ...

will it *work* elsewhere?

can it be *stopped* elsewhere?

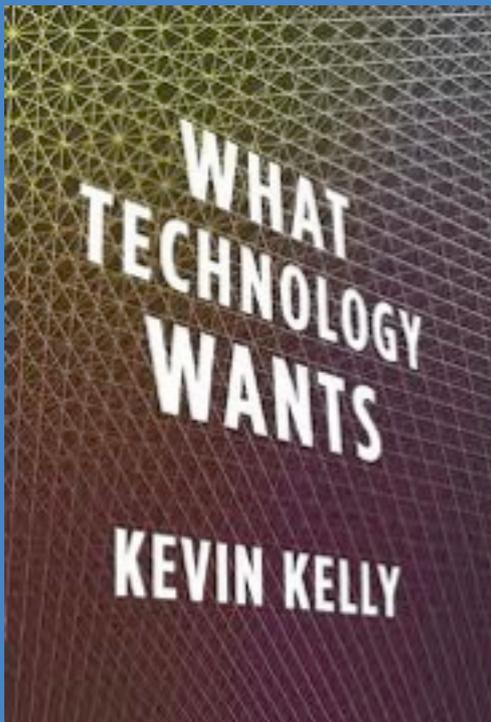
“God forbid that India should ever take to industrialism after the manner of the West.

The economic imperialism of a single tiny island kingdom is today keeping the world in chains. If an entire nation of 300 million took to similar economic exploitation, it would strip the world bare like a locusts.”

Mahatma Gandhi



looking forward



"tipping point where the technium's ability
to alter us exceeds our ability to alter
the technium

...

"these technologies are inevitable ...

Inevitability is not a flaw.

it ... makes predictions easier

Kevin Kelly, *What Technology Wants*, 2010



back and forward

Le Monde

supersession

"ceci [the book] tuera cela [the church]."

Victor Hugo, *Notre-Dame de Paris*, 1831



"le journal [newspaper] tue le livre, comme
le livre a tué l'architecture."

Théophile Gautier, *Mademoiselle Maupin*, 1834



"Ceci tuera cela, le fer [les Halles]
tuera la pierre [St. Eustache]."

Emile Zola, *Le Ventre de Paris*, 1874

overview

what is technological determinism?

taking sides

an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes



why worry?

technology & society who's in charge?

"The acceleration of change in our time is, itself, an elemental force. ... unless man quickly learns to control the rate of change ... we are doomed to a massive adaptational breakdown."

Alvin Toffler, *Future Shock*, 1984

why worry?



technology & society

who's in charge?

"Science explores,

Technology executes,

Man conforms"

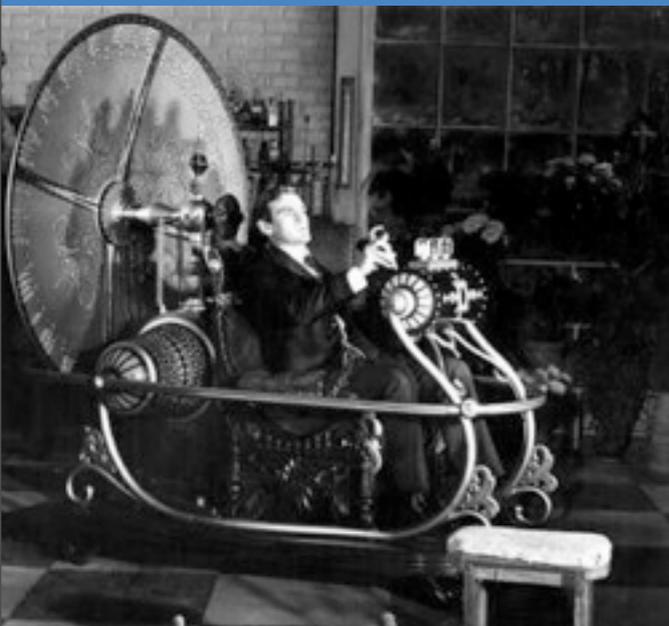
Chicago World's Fair 1933

backing the wrong horse





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

why shouldn't there be?

depends on what you see

"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



H.G. Wells
1866-1946

overview

what is technological determinism?

taking sides

an old idea

wishing on technologies

what's attractive about determinism

why worry?

determined mistakes

determined mistakes

proclaiming supersession
trivializing the past
category mistakes
constraint vs resource
social embedding
necessary vs sufficient
nunberg error
unintended consequences

proclaiming supersession

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

A bicycle may be used as inspiration or a very simple prototype for future generations of automobiles.

Olivia Cheng



the new vs the old



David Edgerton,

The Shock of the Old, 2007

proclaiming supersession

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

A bicycle may be used as inspiration or a very simple prototype for future generations of automobiles.

Olivia Cheng



the new vs the old



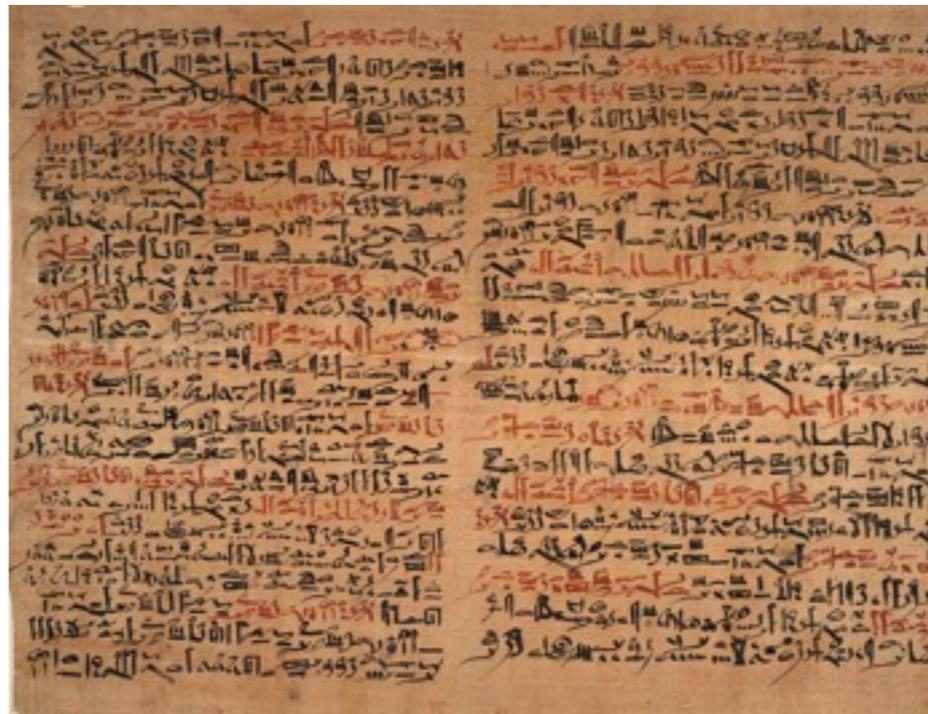
David Edgerton,
The Shock of the Old, 2007



trivializing the past



coming up:
manuscript culture



category mistakes

coming up
social implications



Grandfather:
Well, I finally finished my
doctoral thesis.



Woman:
Way to go, Gramps.



Grandfather:
Did my research at
Indiana University.

Woman:
Indiana?



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

*She cocks her ear to take
this all in.*



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



Tag:
IBM. Solutions for
a small planet.

constraint vs resources

coming up:
newspaper, telegraph



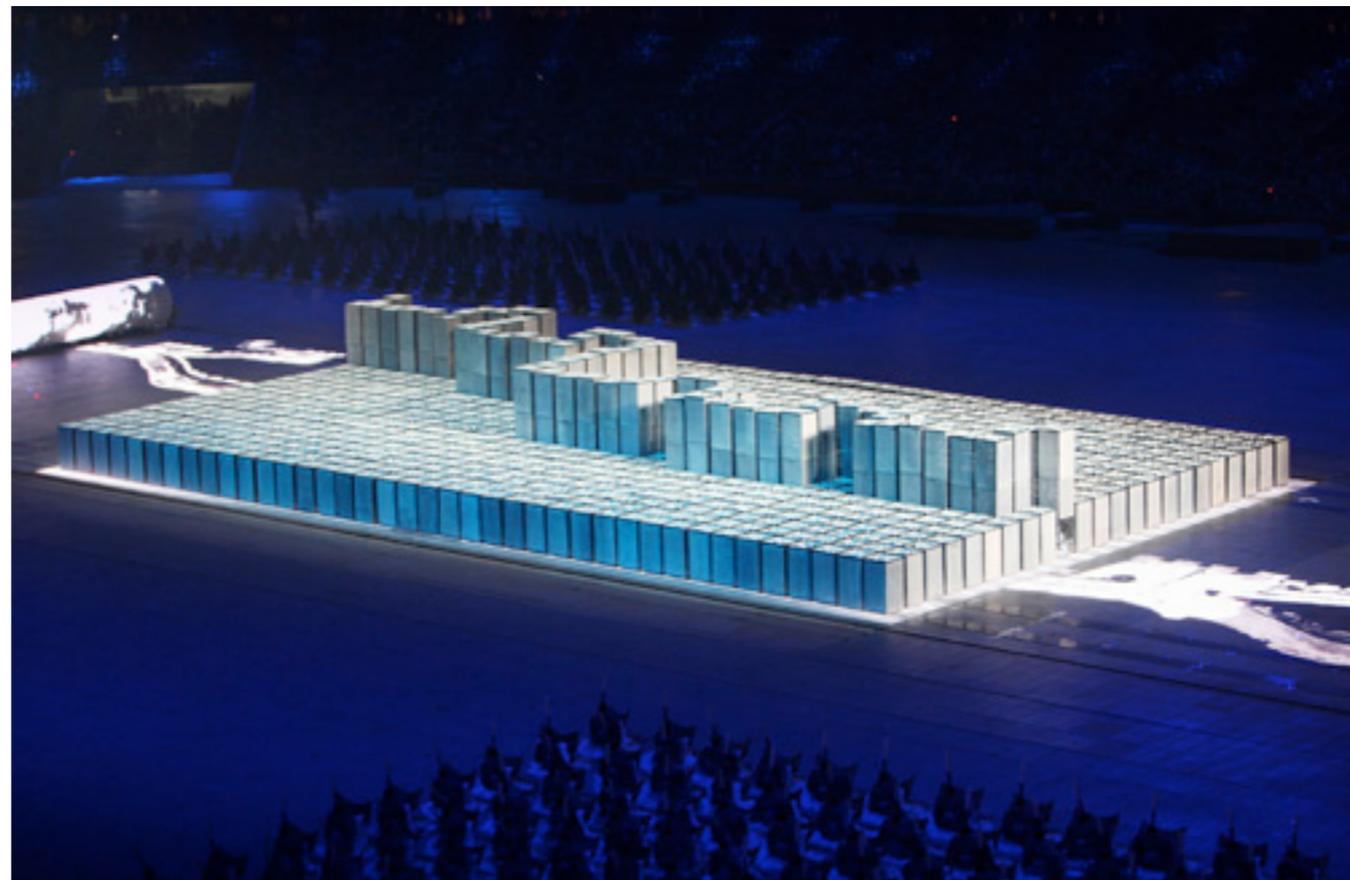
social embedding

coming up:
telephone



necessary vs sufficient

coming up:
print technology

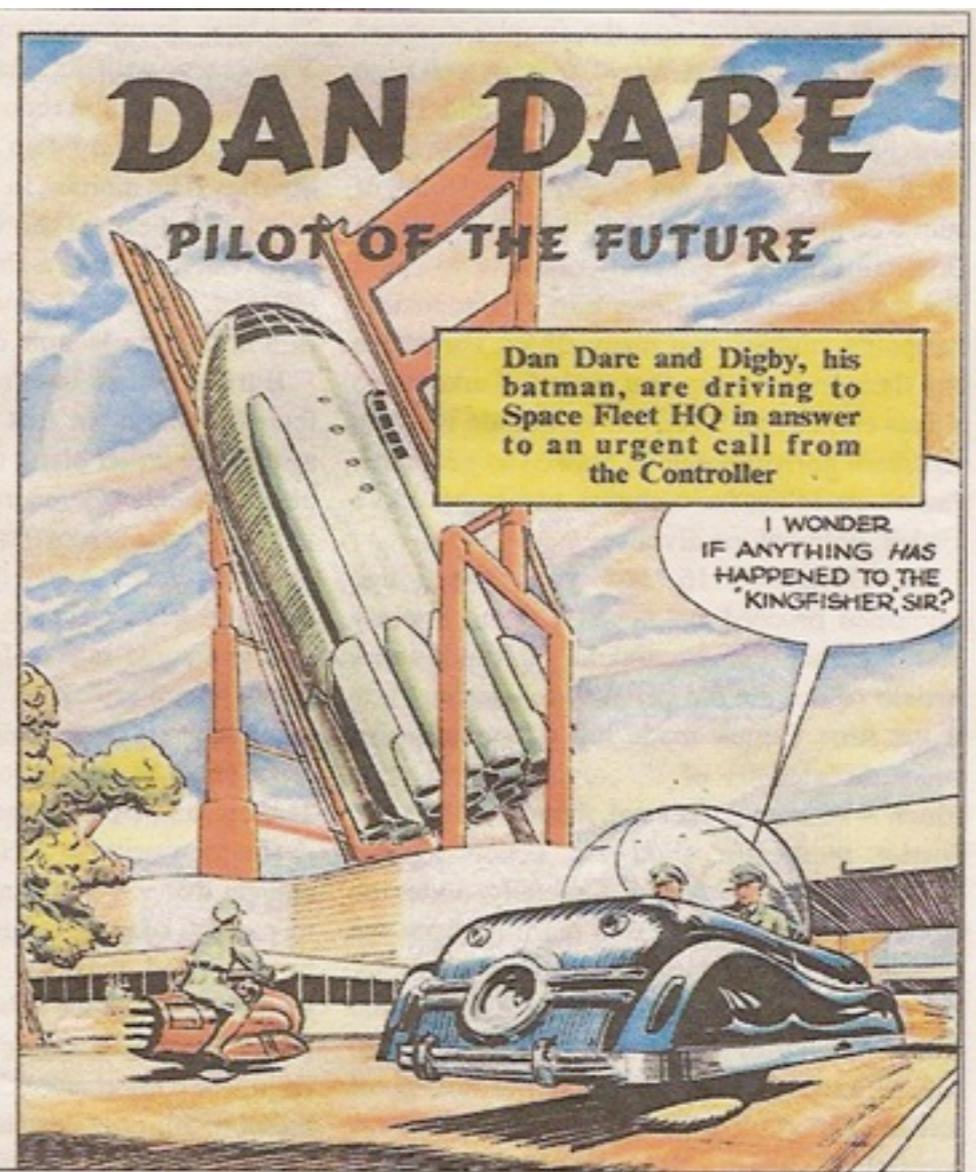
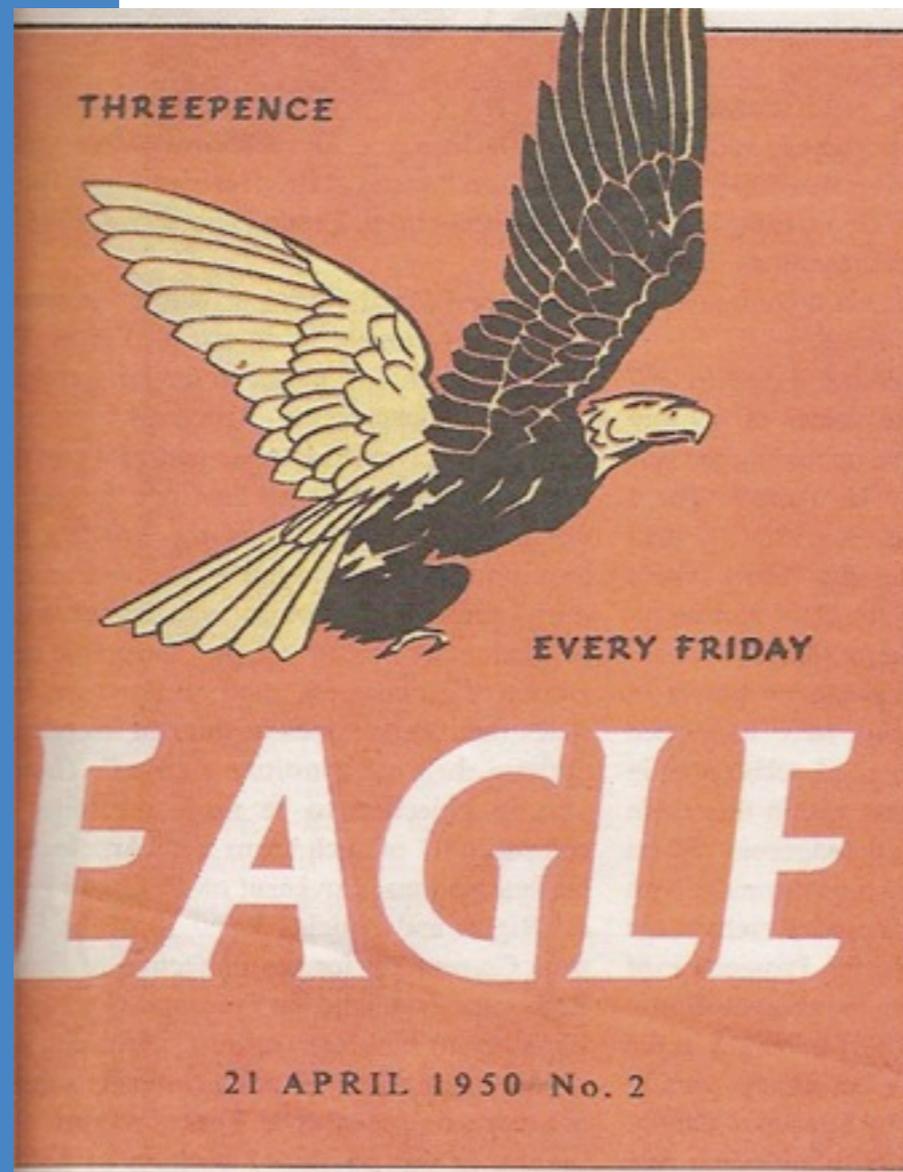


"The danger of ... sole cause efficacy"

-- Heilbroner
Hofl II -- determinism 59



nunberg error



unintended consequences



unintended consequences
moral hazards
rebound

Edward Tenner,
Why Things Bite Back:
Technology and the
Revenge of Unintended
Consequences, 1997

unintended consequences



unintended consequences
moral hazards
rebound



Edward Tenner,
*Why Things Bite Back:
Technology and the
Revenge of Unintended
Consequences*, 1997

Hofl II -- determinism 61

in conclusion

how to think about determinism

what happened?

what did (or did not) come before?

what did (or did not) follow?

what did (or did not) contribute?

what happened elsewhere?

what's likely to be underestimated?

coming up first

27 Jan: The First Technologies of Information: Writing Systems

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