



history of information 2

on determinism

History of Information
January 27, 1009

slides:



agenda

aob

administrative issues

?

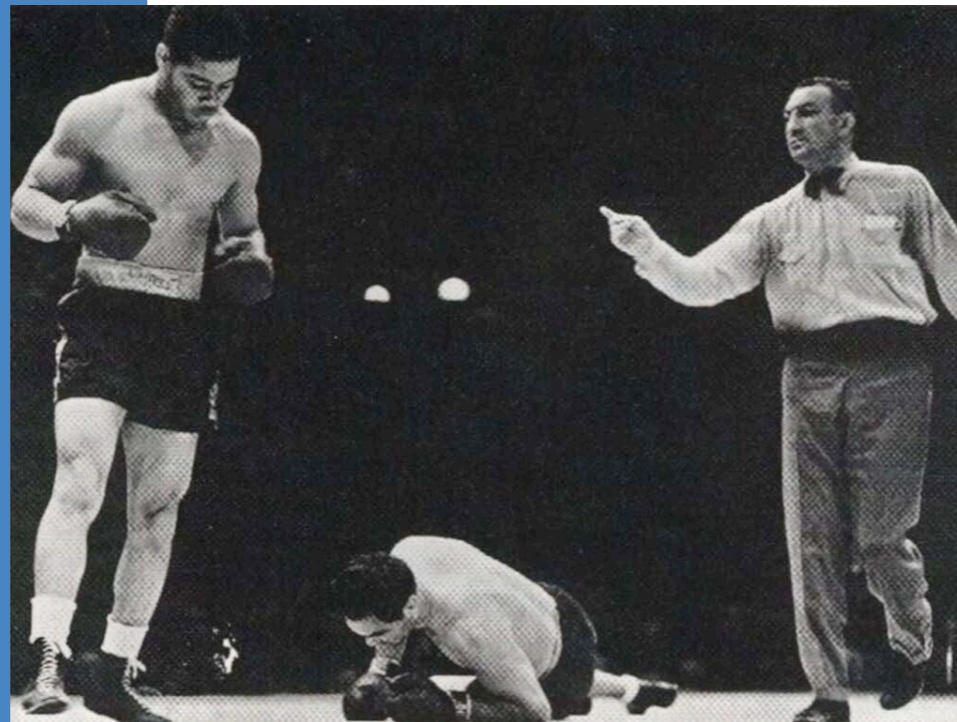
confronting determinism

- assignment
- what is technological determinism?
 - what's attractive about it?
 - how to deal with it

reading for Thursday



taking sides



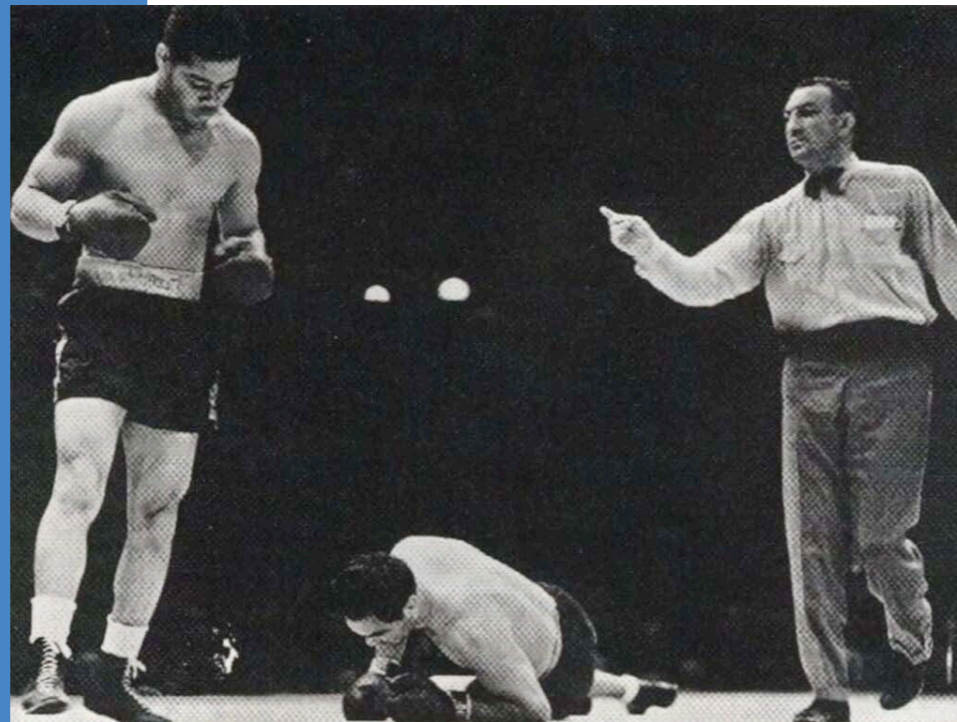
Heilbroner won

Bijker won

neither one



taking sides



Heilbroner won

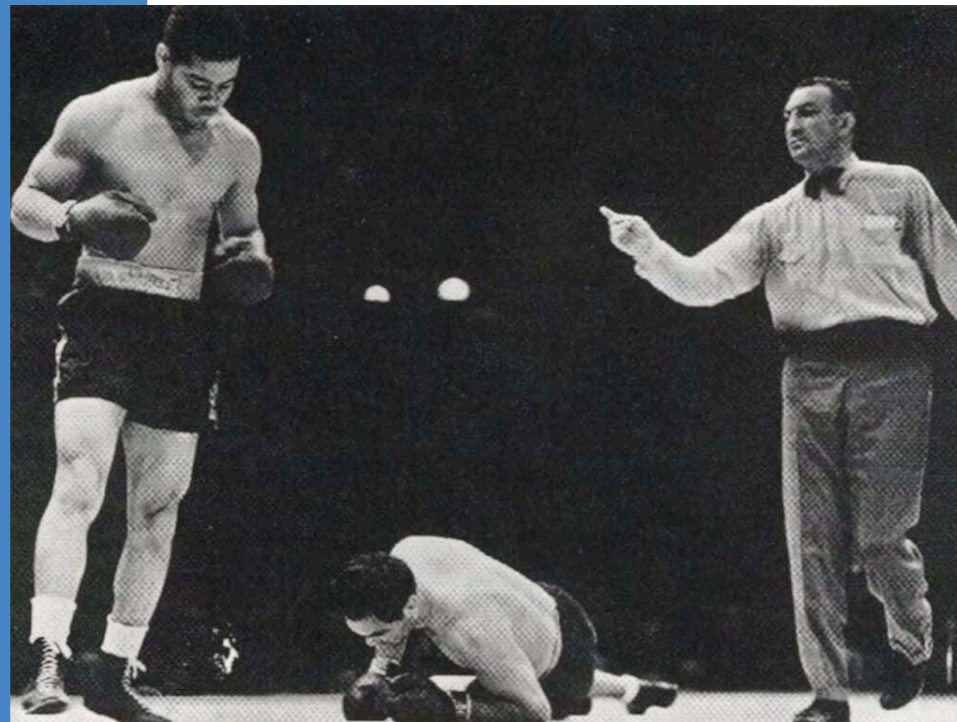
Bijker won

neither one

last year



taking sides



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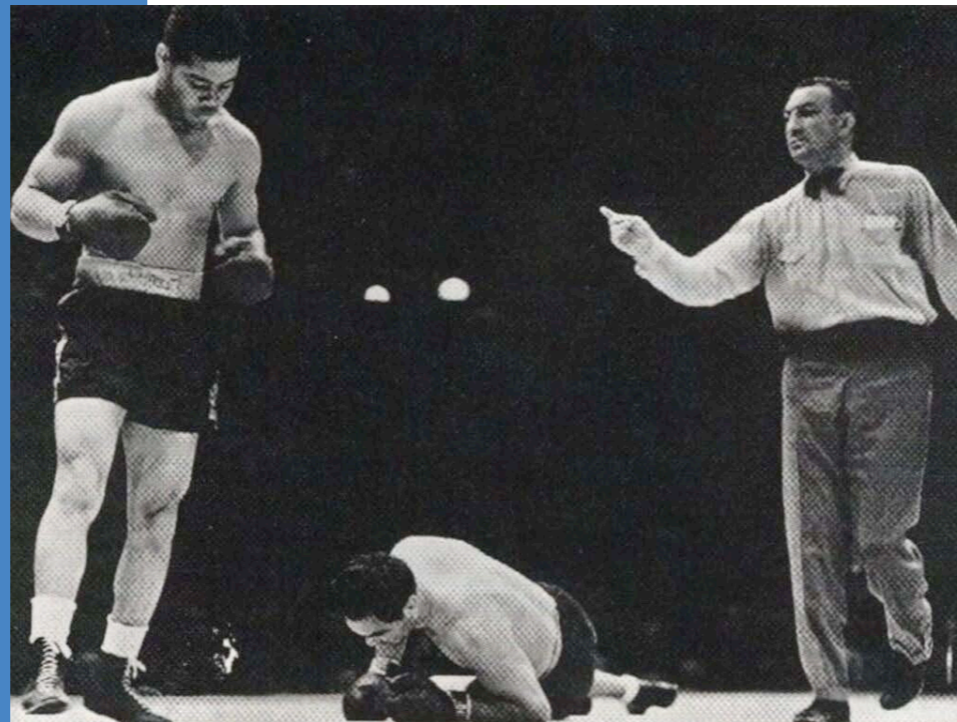
neither one

last year

Heilbroner -- 55%



taking sides



Heilbroner won

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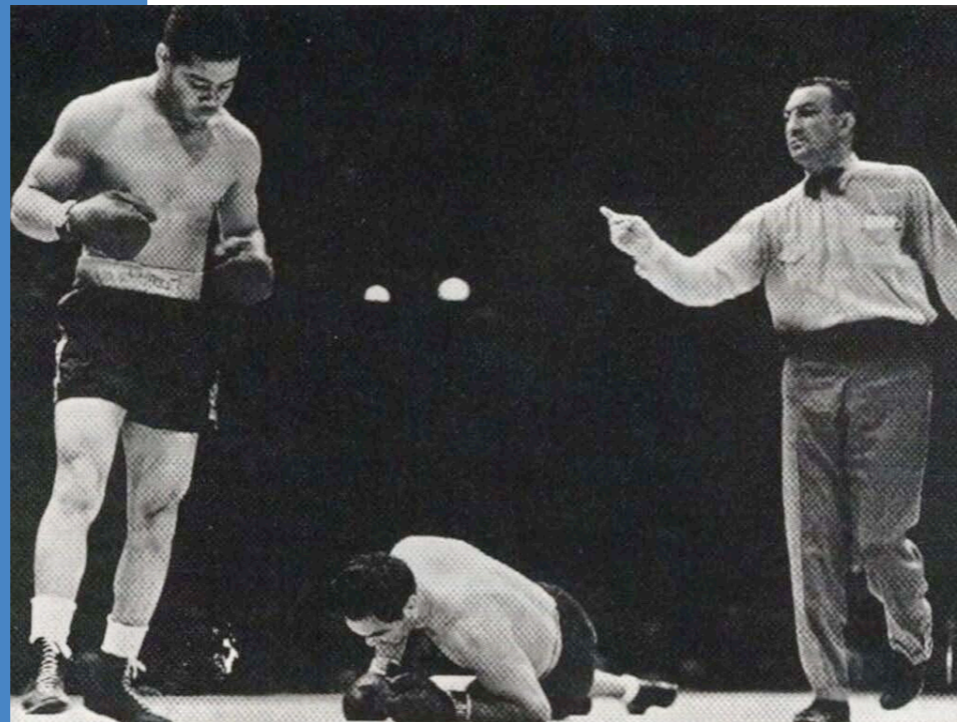
last year

Heilbroner -- 55%

Bijker -- 40%



taking sides



Heilbroner won

Bijker won

neither one

last year

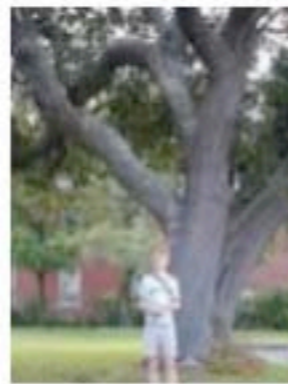
Heilbroner -- 55%

Bijker -- 40%

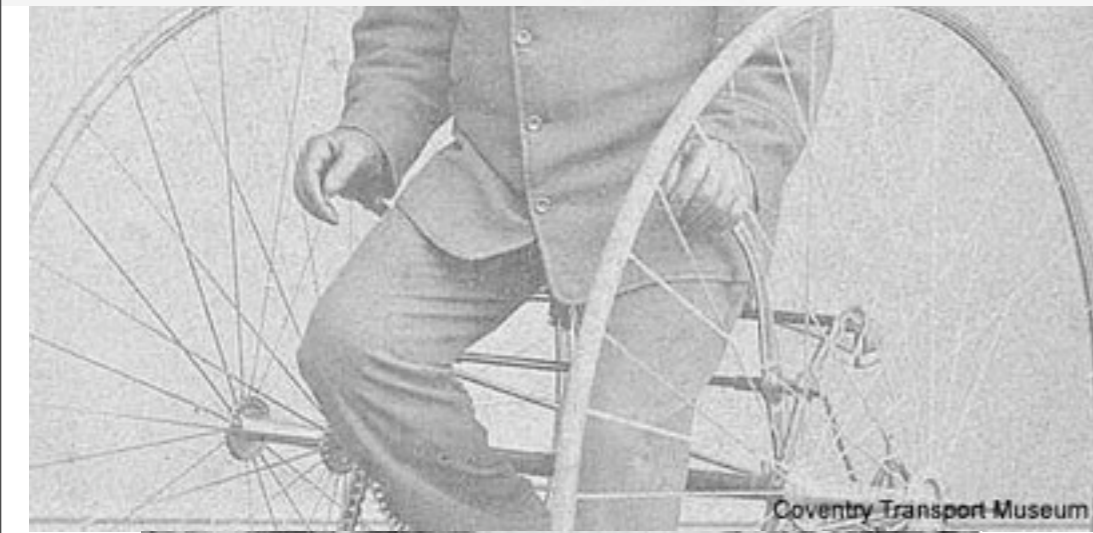
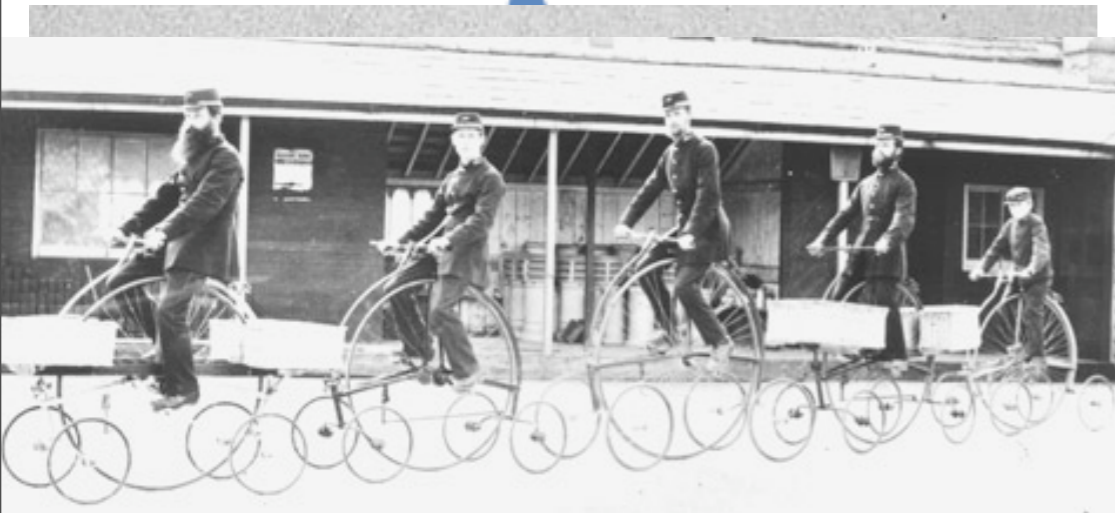
neither one -- 5%

of bicycles, bicycles, and bicycles

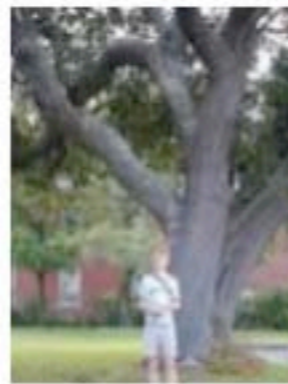
What isn't IT?



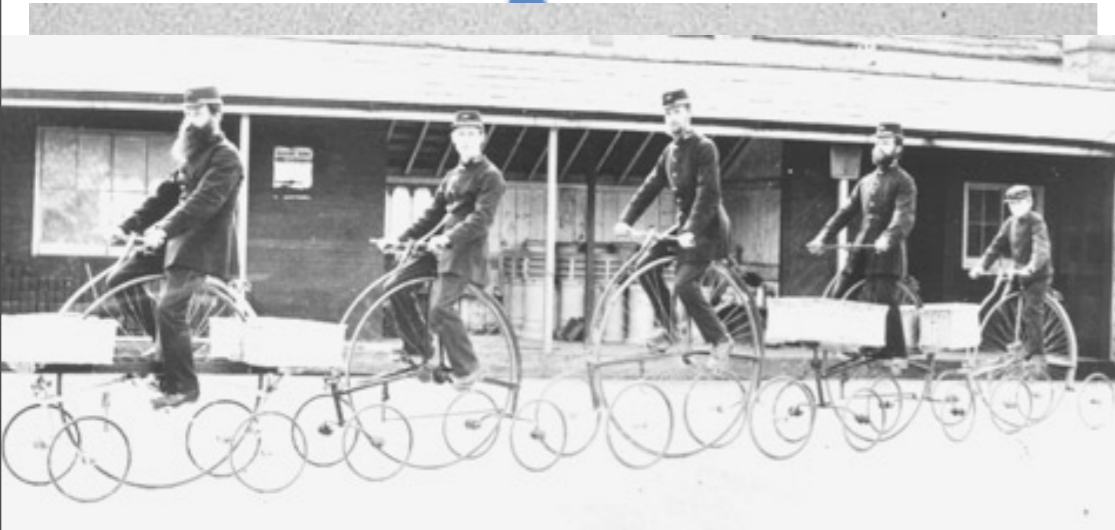
of bicycles, bicycles, and bicycles



What isn't IT?

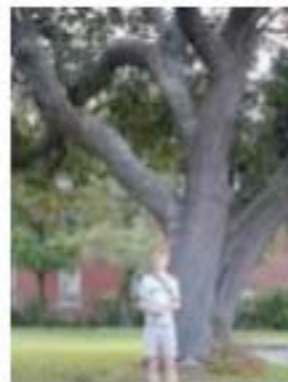


of bicycles, bicycles, and bicycles

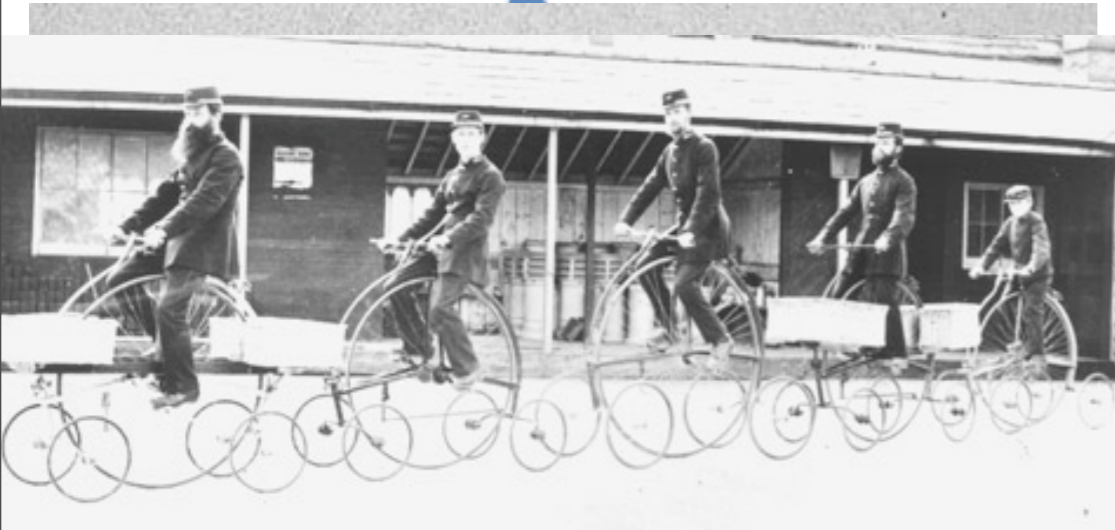


Coventry Transport Museum

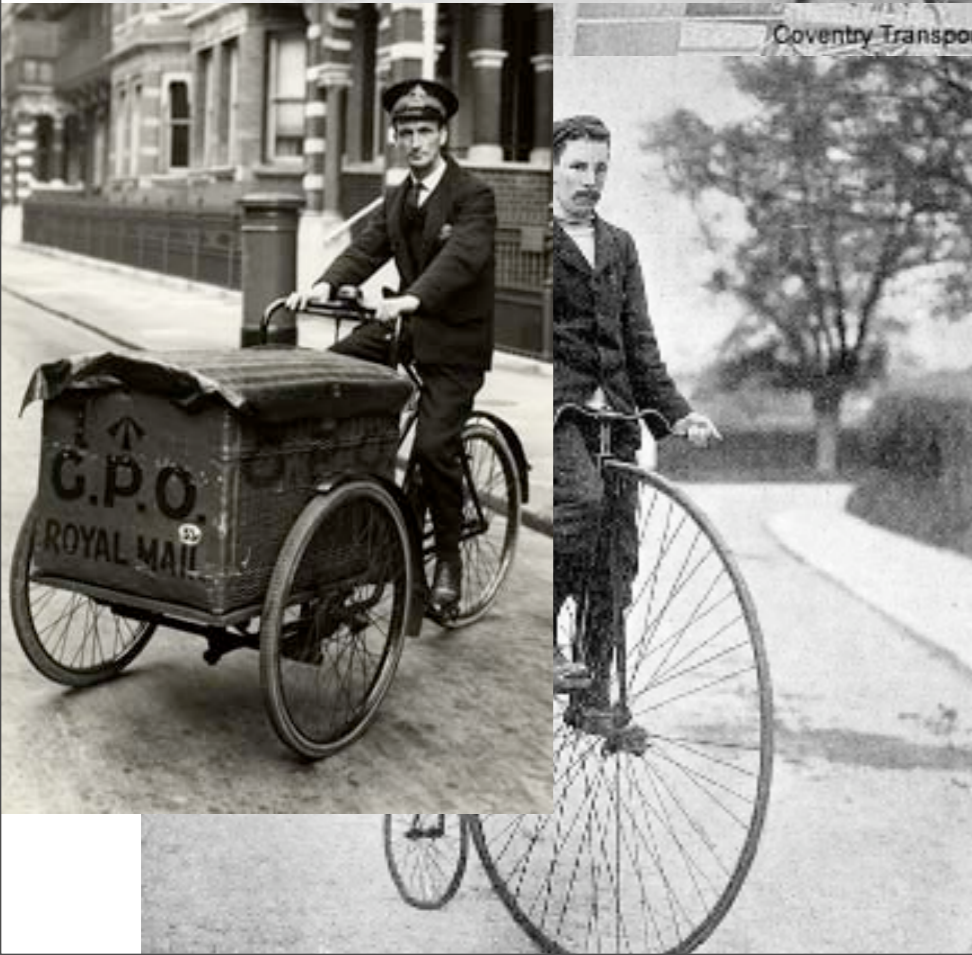
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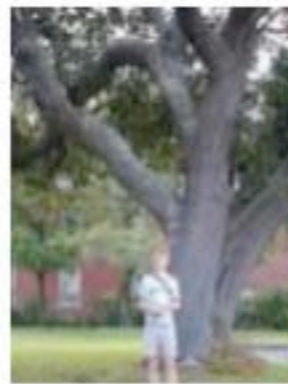
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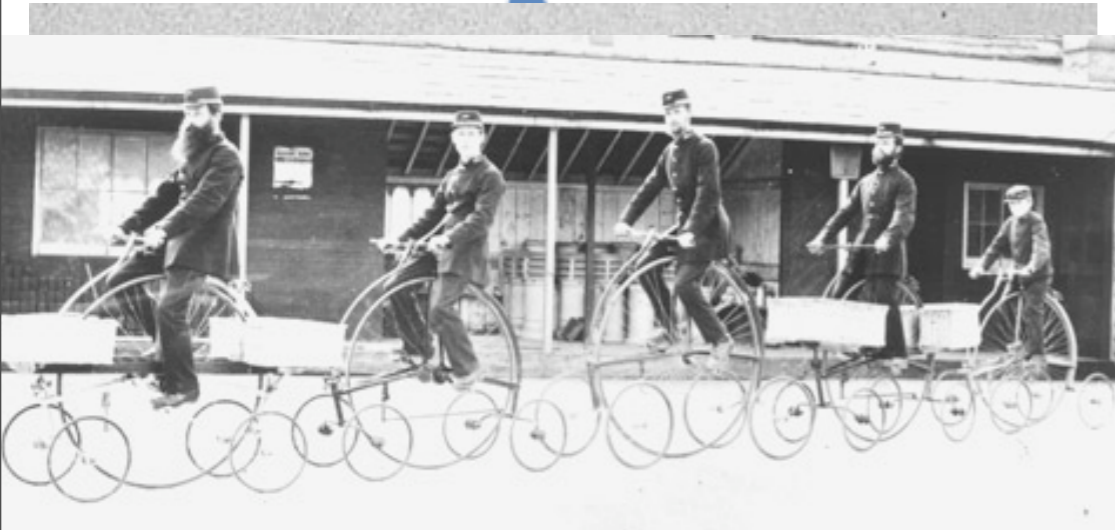
Coventry Transport Museum



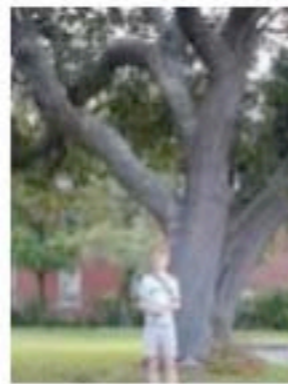
What isn't IT?



of bicycles, bicycles, and bicycles



What isn't IT?





confronting determinism

for all time?



"The day the universe changed"

James Burke,
Printing Transforms Knowledge
BBC 1986



what is it?

it's the claim that

"new 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



"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*



guns, germs & steel... *and* information technology



"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



beyond print

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

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.

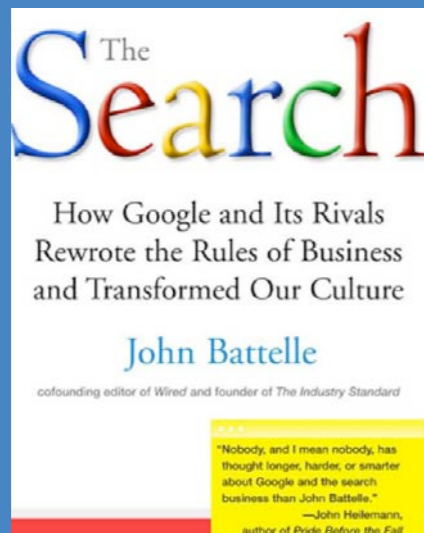


bending your mind

"When technology shifts, it bends the culture"

Kevin Kelly, "Becoming Screen Literate,"

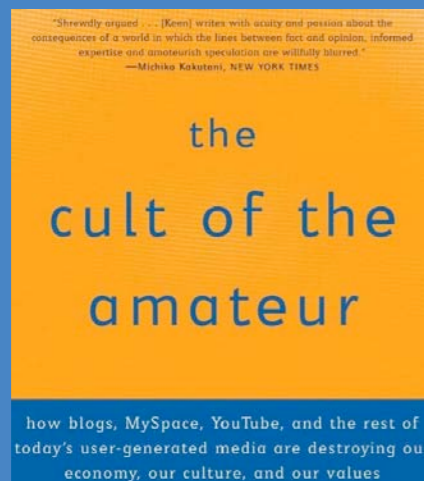
New York Times 2008



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



who knows?

Nobel Winner:

Internet Might have stopped Hitler

"Who knows, if the Internet had existed at the time, perhaps Hitler's criminal plot would not have succeeded."

Jean-Marie Gustave Le Clezio, 2008



overview



Chicago World's Fair, 1933:

"Science Explores, Technology
Executes, Man Conforms"



overview



Chicago World's Fair, 1933:

"Science Explores, Technology
Executes, Man Conforms"

"Guns don't kill people. People kill
people."

NRA slogan



overview

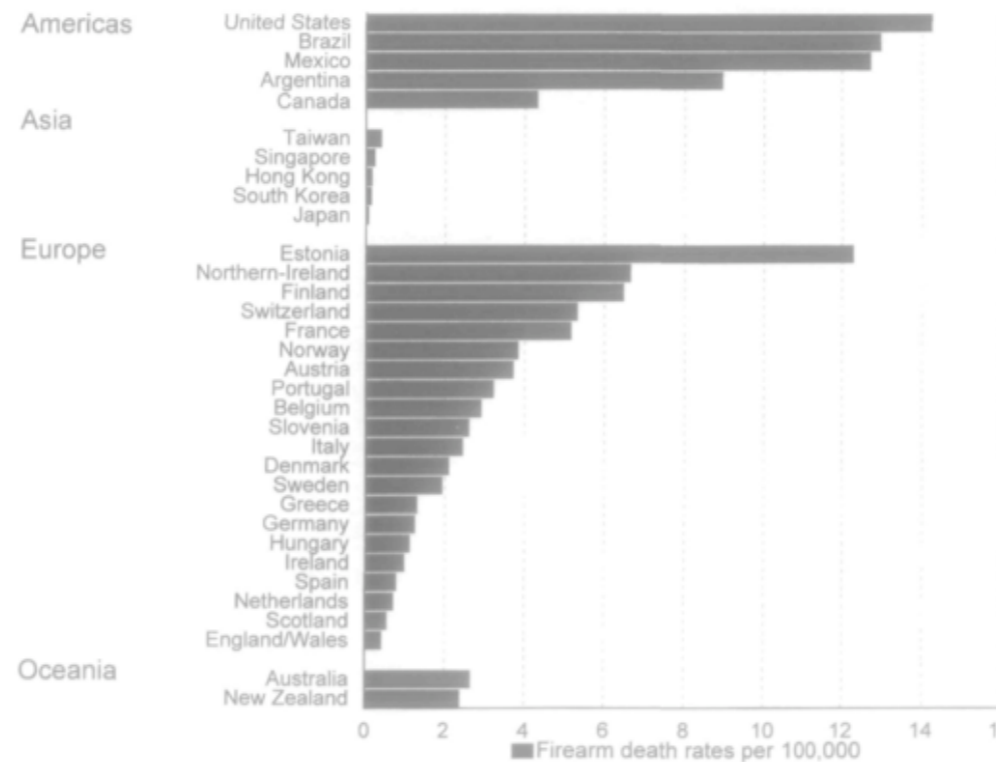


Chicago World's Fair, 1933:

"Science Explores, Technology Executes, Man Conforms"

"Guns don't kill people. People kill people."

NRA slogan





what's attractive about determinism?

clear causality

contrast

RLH: 20 pp vs WEB 80 pp

"socio-technical systems, relevant social groups, interpretive flexibility ..."

"every technology sits in a technological custard ..."

clean history

"whiggishness ..."

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

Herbert Butterfield,
*The Whig Interpretation
of History*, 1931



clean and simple

Wired blog:
10 gadgets that changed the world

- 59.4% - **Bicycle**
- 7.8% - **Transistor**
- 7.8% - **Electro-magne**
- 6.3% - **Computer**
- 4.6% - **Germ theory o**
- 4.5% - **Radio**
- 4.0% - **Internet**
- 3.4% - **Internal Comb**
- 1.1% - **Nuclear Power**
- 1.1% - **Communicatio**





... and something to build a future on

thinking (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.



the power of prediction

Herman Kahn, *The Year 2000: A Framework for Speculation on the Next 33 Years*, 1967



direction undetermined

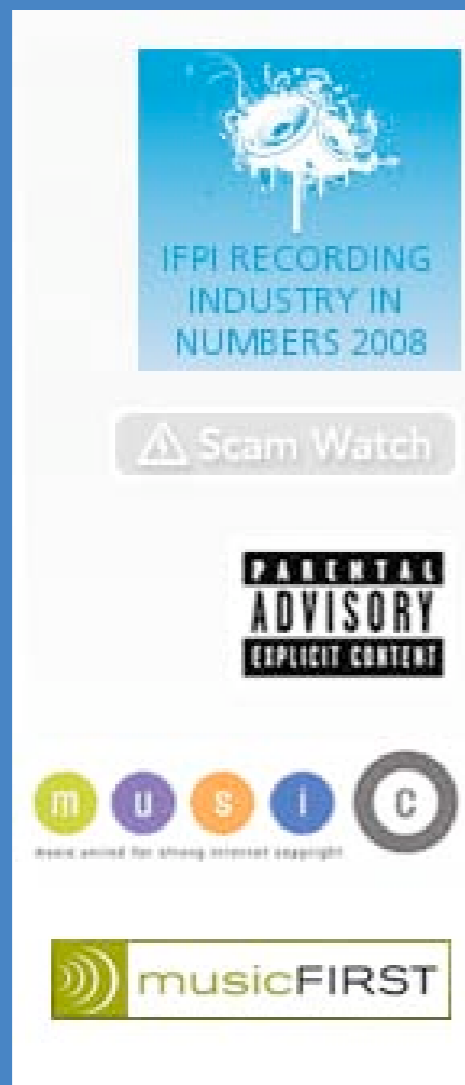
At this point, you may suspect that I have swung from one American genre, the jeremiad, to another, utopian enthusiasm.

Robert Darnton,
"Google and the
Future of Books,"
*New York Review of
Books*, 2009

"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."



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



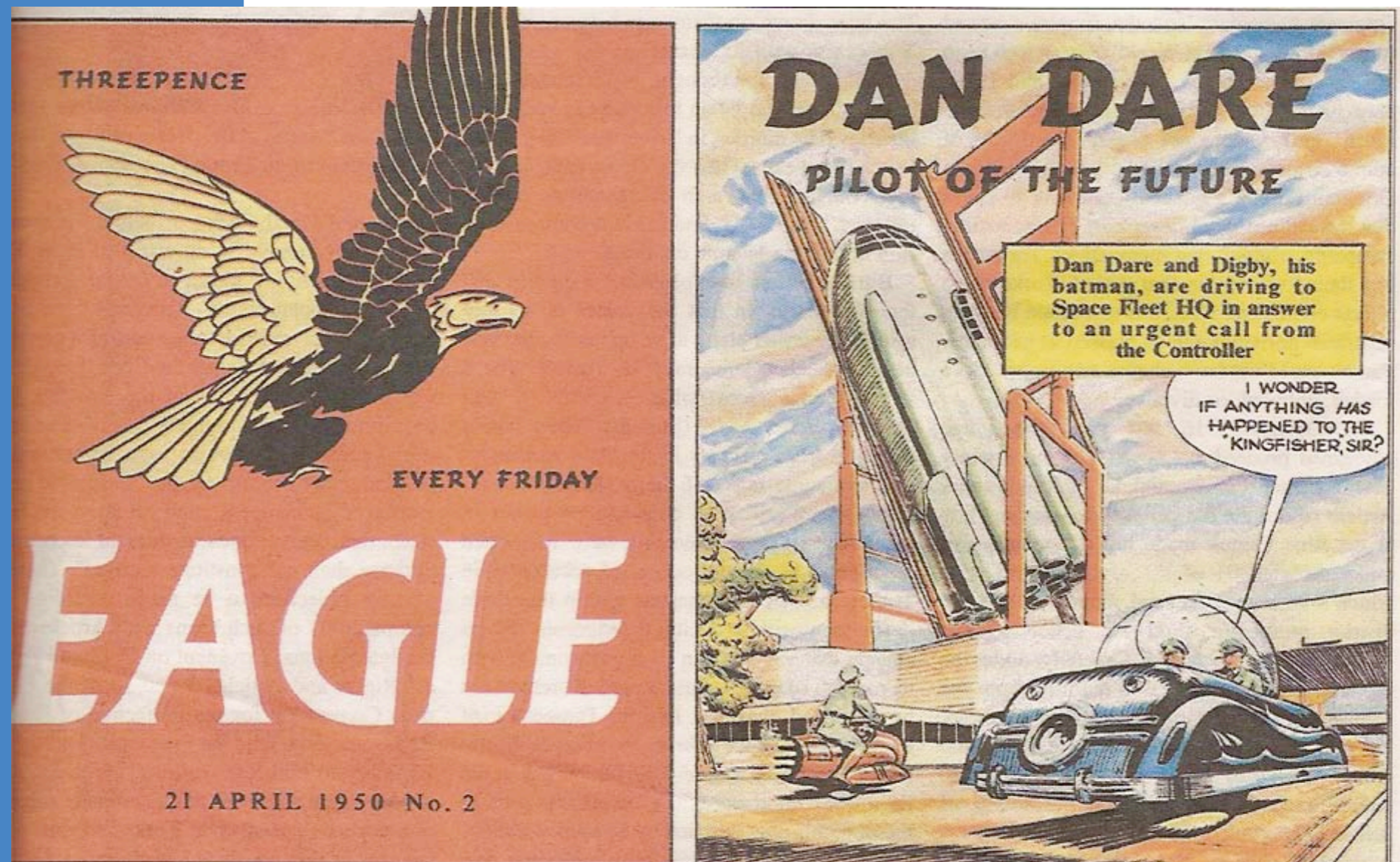
"We have locked up most of twentieth -
century culture and done it in a
particularly inefficient and senseless way."

James Boyle, *The Public Domain*, 2008



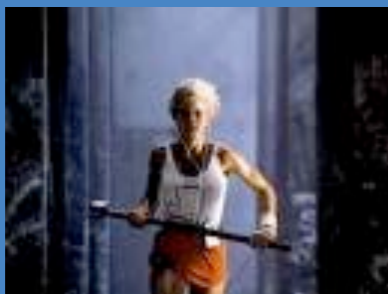
diagnosing determinism

how well did they hold up?





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>]



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.

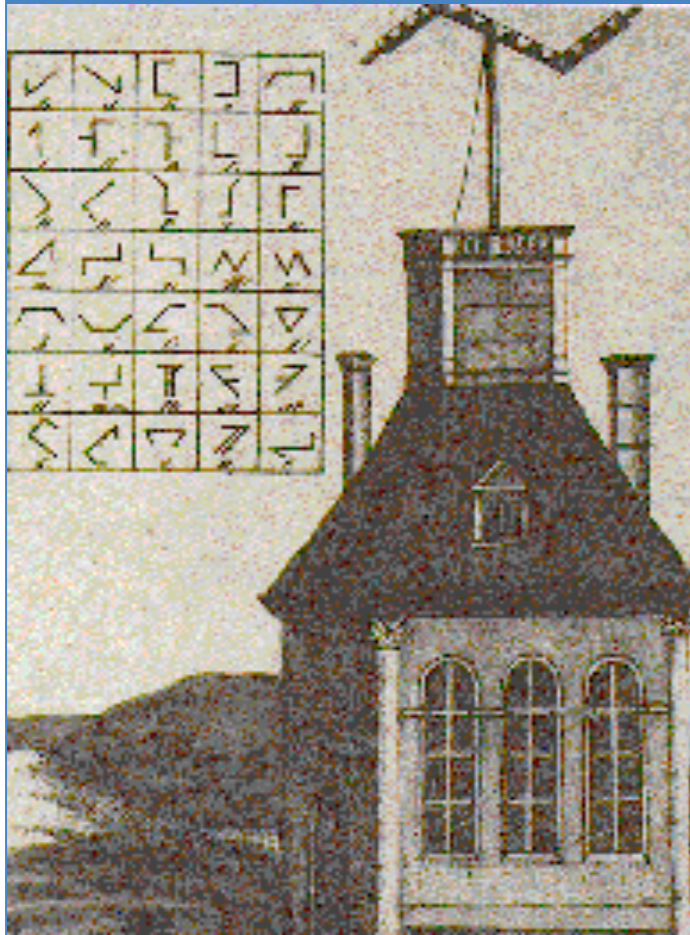


what and when?

"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."



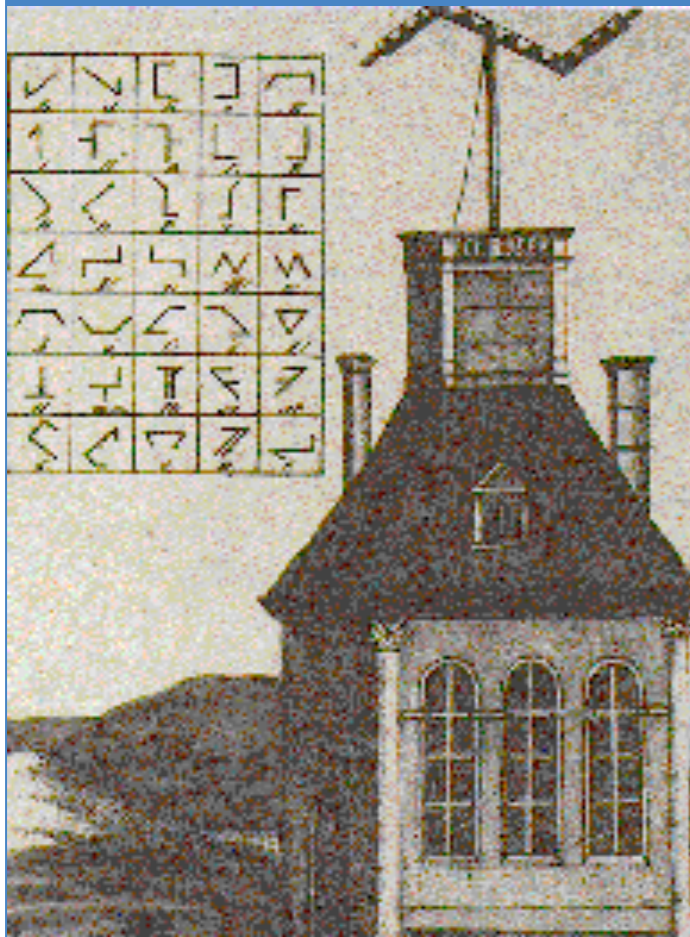
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what and when?



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Alexandre Vandermond, 1795



a continuing tradition

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

1728

The Death of Distance
--Frances Cairncross, 2000



a continuing tradition

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but space and time,
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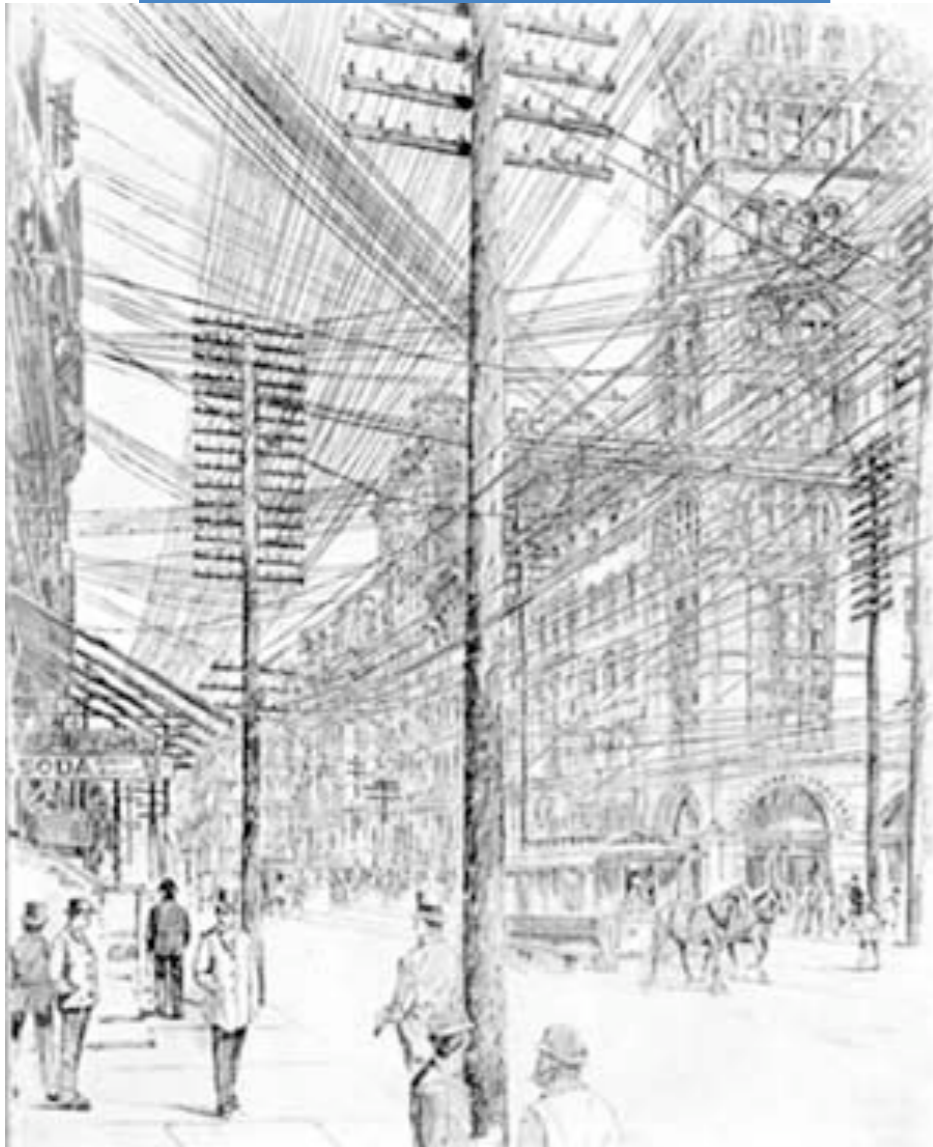
1728

The Death of Distance --Frances Cairncross, 2000





looking forward/ looking back



"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



technological sublime

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

"Westward the
course of
empire takes
its way."





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



what and when?

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—*Scientific American*, 1841



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



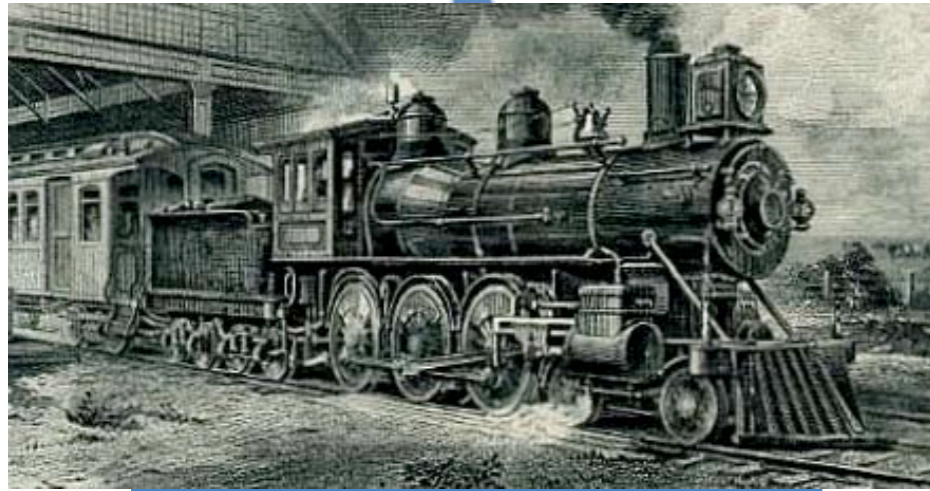
sea to shining sea



"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



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."**



electrical sublime

... 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

"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

Marks of time:

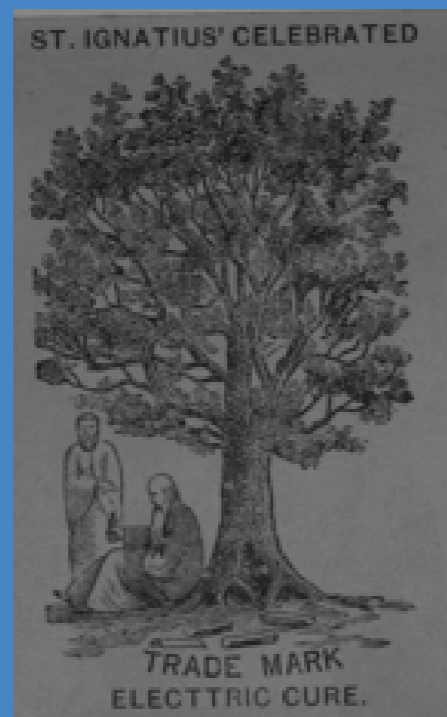
electric shoe

electric flour

electric cough lozenges

electric velveteens

electric confectionary



1889

"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



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*



testing time



"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



looking back 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

Nunberg fallacy



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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determined mistakes

The New York Times

Israeli Entrepreneur
Plans a Free Global
University That Will Be
Online Only

we can make a free university
for students all over the world,
anyone who speaks English and
has an Internet connection

January 26, 2009

technology vs institution



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.

eg, network vs network



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

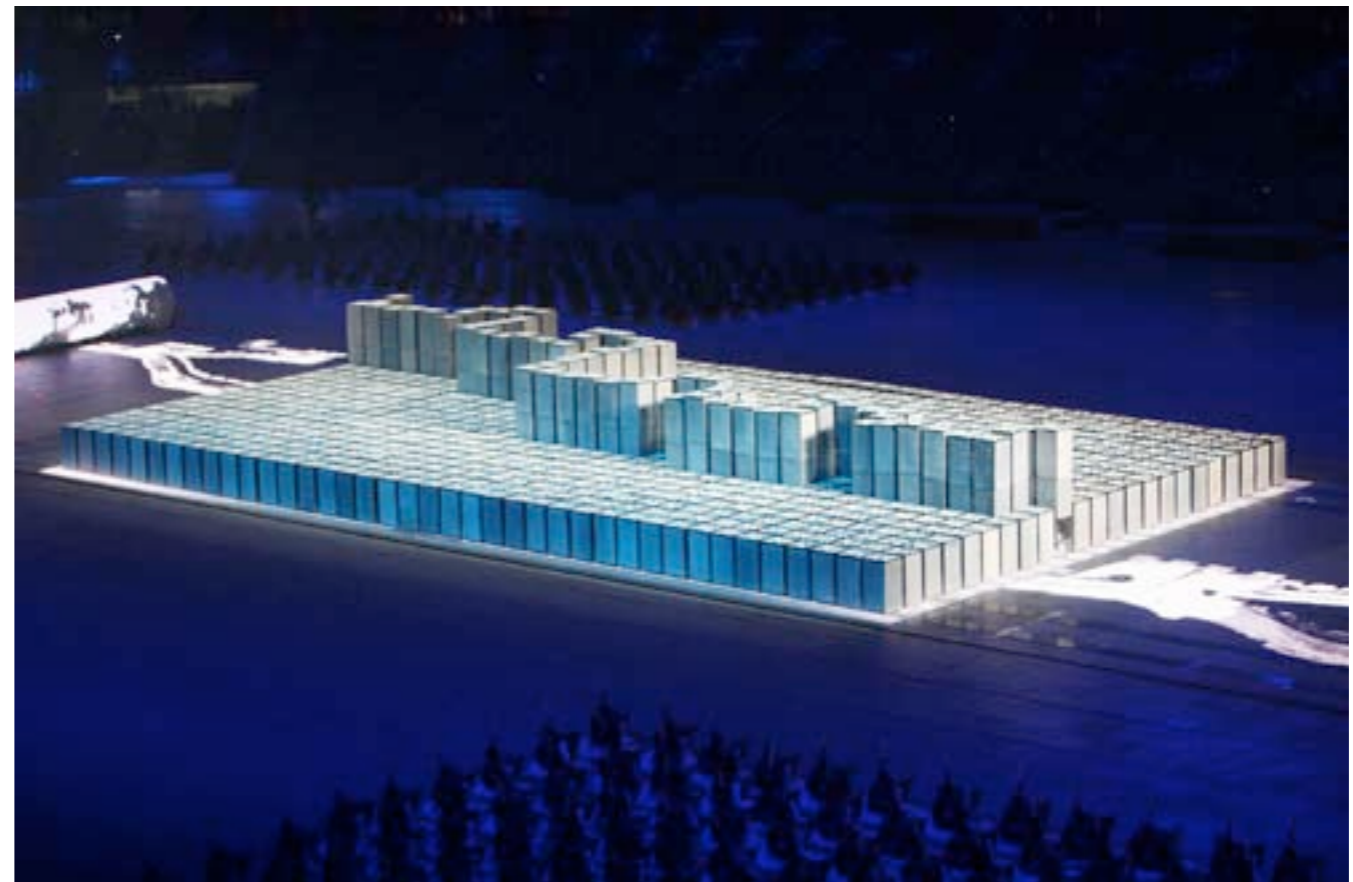
constraint vs resource





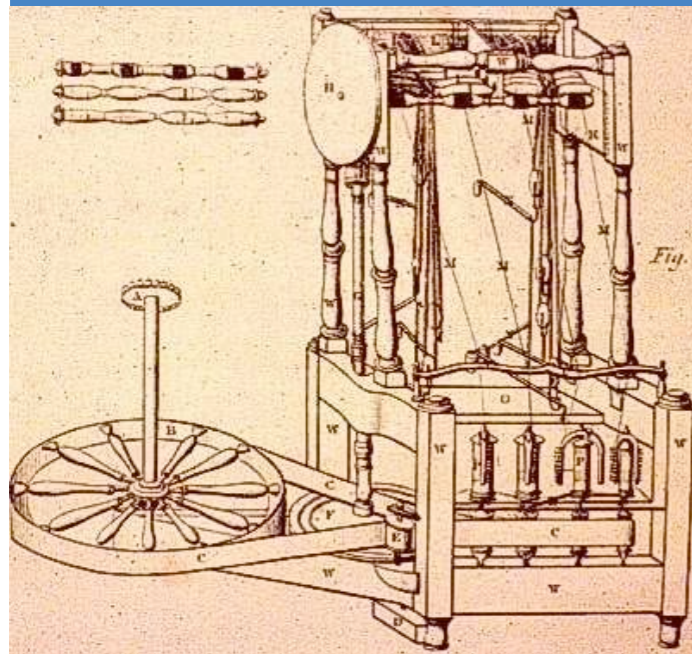
determined mistakes

getting your history wrong





btw ...



getting your history wrong


"All the technical elements ... have been available ... since da Vinci."

true?

- 3,500 bce wheel
- 1818 first French, German, & English patents
- 1839 pedals (Scotland)
- 1869 bearings,
- 1877, chain drive
- 1888 Dunlop tyres with Goodyear rubber
- 1891 removable tyre
- 1897 derailleur



moreover ...



"The bicycle drawing was discovered in 1974 on the back of a folded sheet of authentic drawings. Dr Lessing sought out an art historian who had examined the same pages in 1961. Alas, Carlo Pedretti remembered no bicycle. Only two circles with curved lines through them. Dr Lessing thinks the forger used the two Leonardo circles as the basis for a doodled bike, sometime after Italian monks began restoring the manuscript in the 1960s."
Guardian, October 16, 1997.



nunberg fallacy





looking forward determined mistakes

unintended consequences

superbugs

ring tunes

reindeer

moral hazard

seatbelts

helmets

naked streets



looking forward determined mistakes

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looking forward determined mistakes

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determining

what happened?

what did (or didn't) come before?

what did (or didn't) follow?


what contributed?




next up

the technology that did change the world?

29 Jan: The First Technologies of Information: Writing Systems

 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