



# technological determinism

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**tools to change the world**

**Paul Duguid**

**history of information**

January 27, 2015



# admin

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**waitlist**

clearing

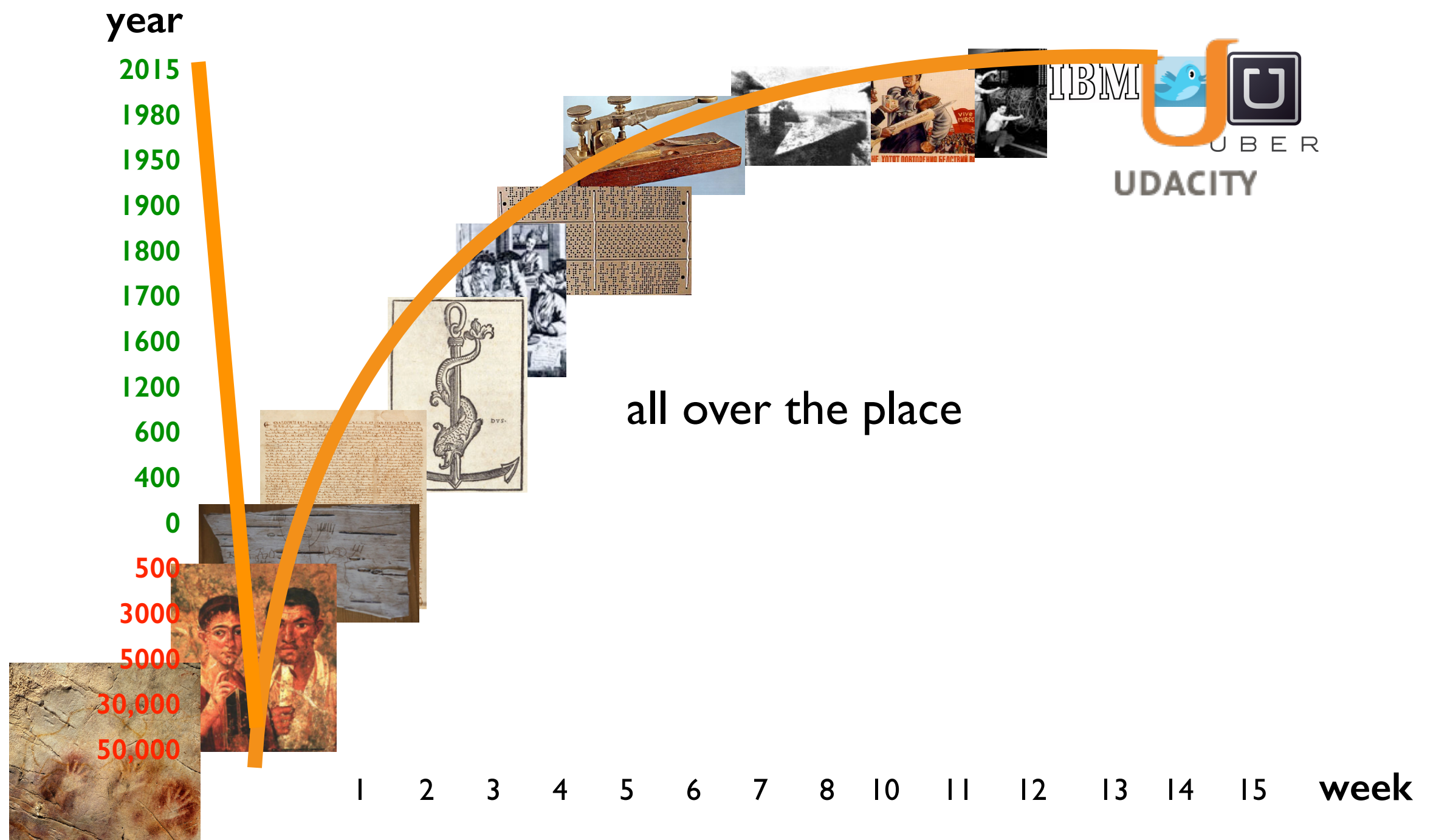
**slides**

—link on web page  
bcourses>files>

**Bancroft tour**



# where are we?





# picking up threads

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## **not just generational**

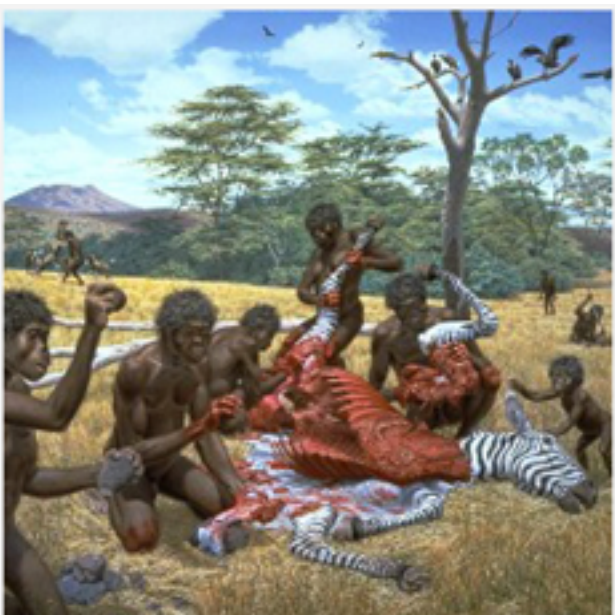
“At Facebook, we’re inspired by technologies that have revolutionized how people spread and consume information. We often talk about inventions like the printing press and the television – by simply making communication more efficient, they led to a complete transformation of many important parts of society. They gave more people a voice. They encouraged progress. They changed the way society was organized. They brought us closer together.”

*Letter from Mark Zuckerberg US Securities and Exchange Commission  
Form S-1 REGISTRATION STATEMENT Under The Securities Act of 1933*



Jan 20

# local insight



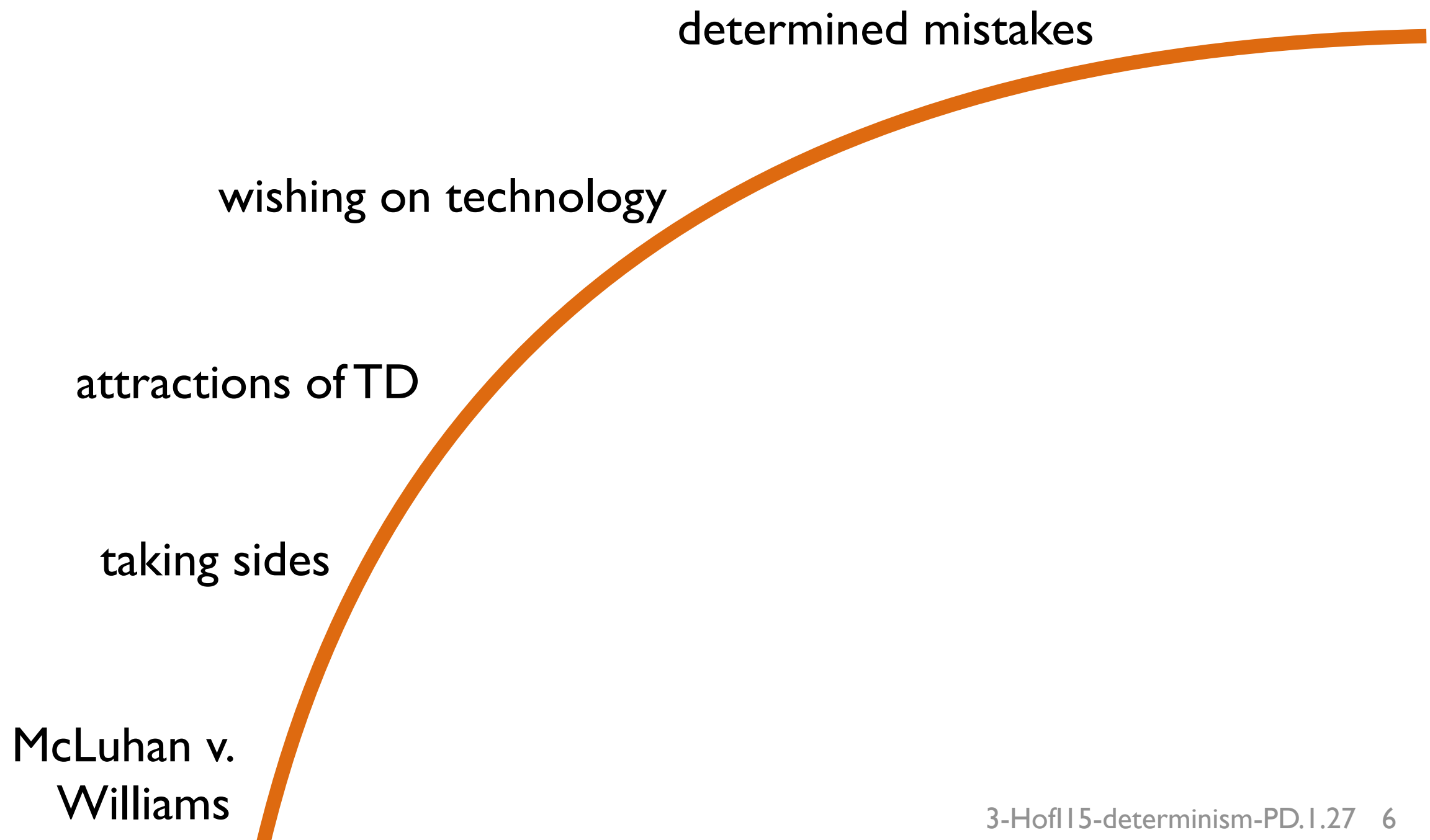
Stone tools used by our oldest hominin ancestors 2.5 million years ago are believed to have sparked the evolution of human communication (Illustration by Jay Maternas)

"Our findings suggest that stone tools weren't just a product of human evolution, but actually drove it as well, creating the evolutionary advantage necessary for the development of modern human communication and teaching," said Thomas Morgan, lead author of the study and a postdoctoral researcher in psychology at UC Berkeley."



# overview

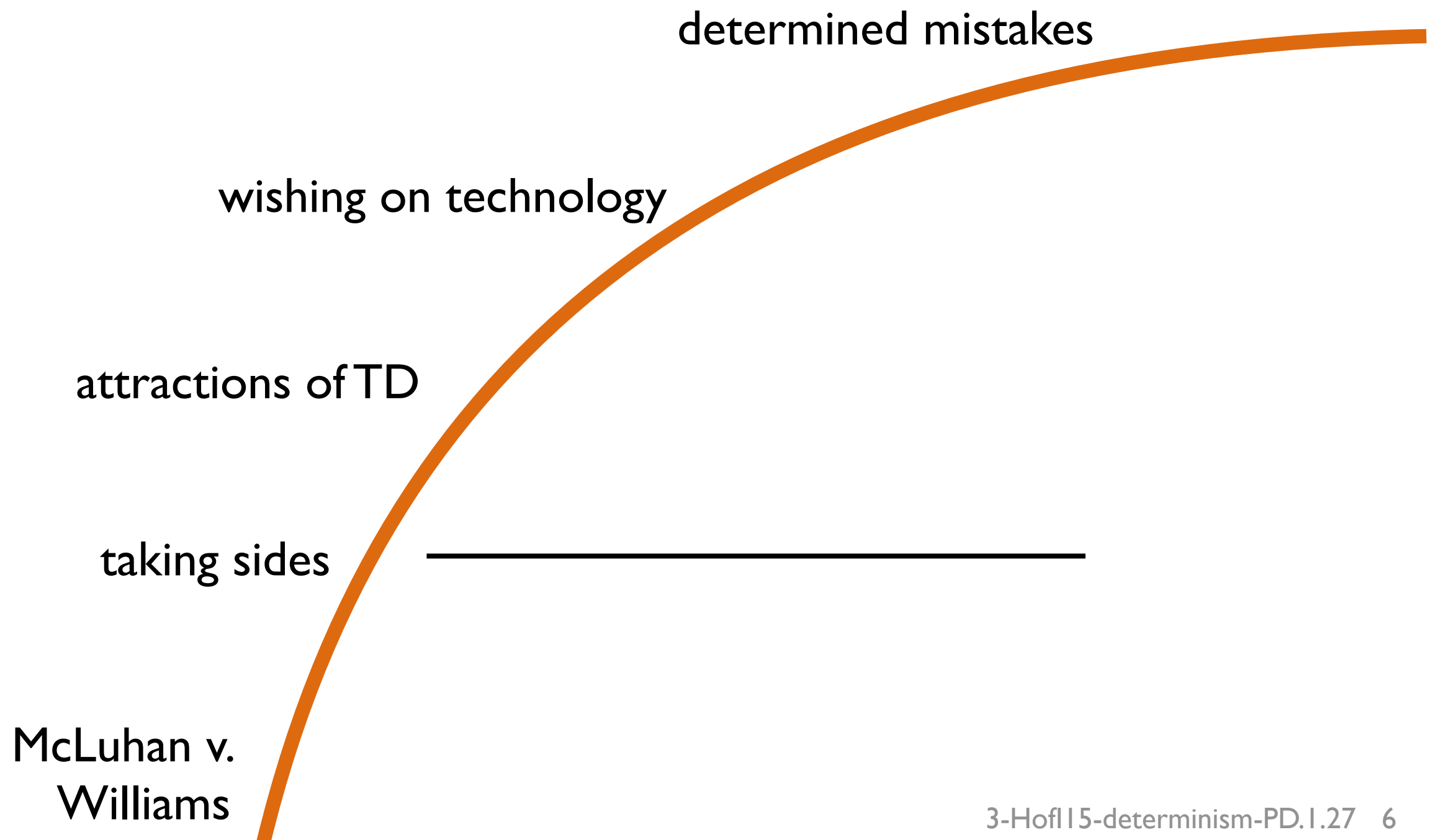
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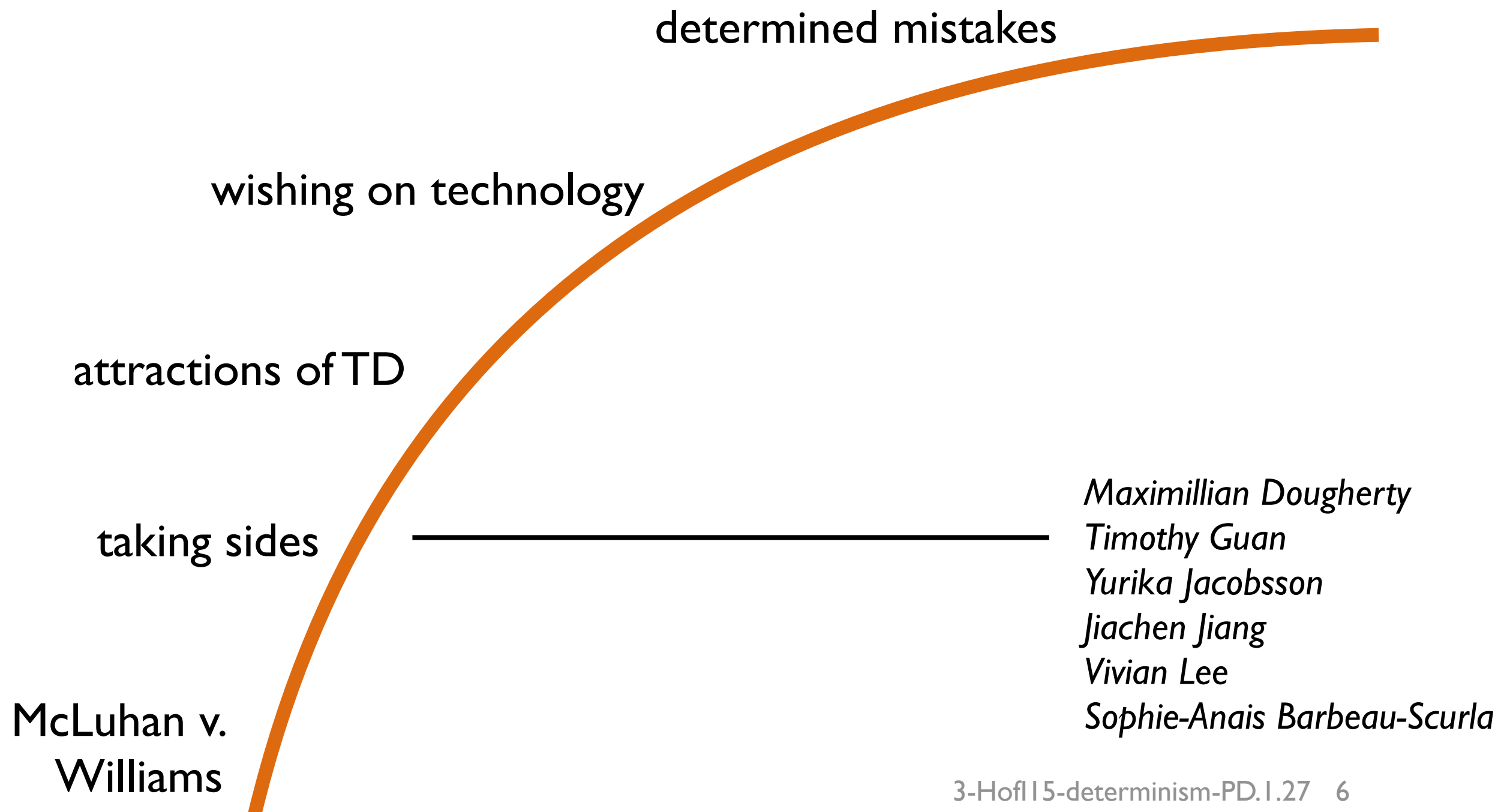
# overview

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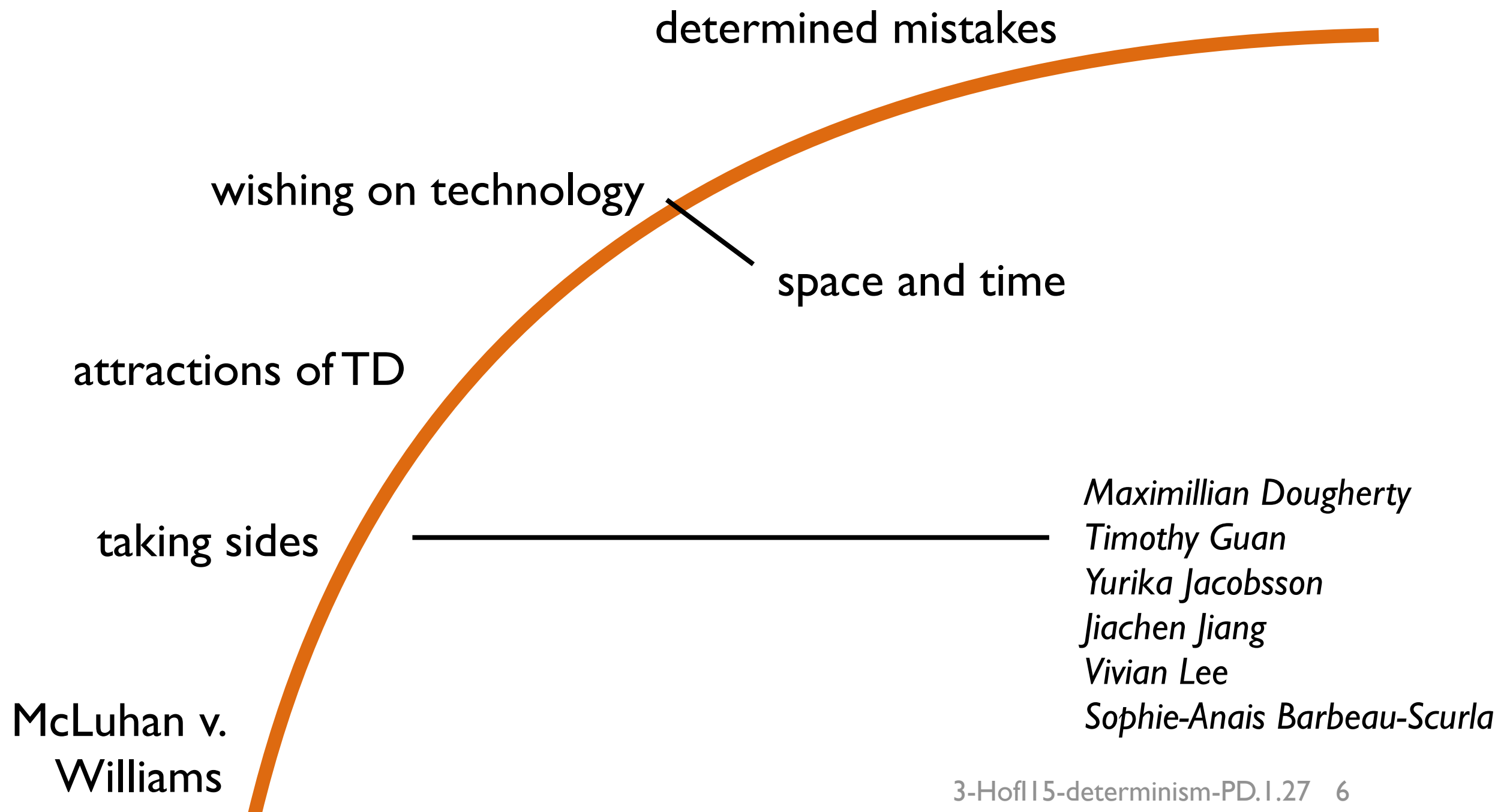
# overview





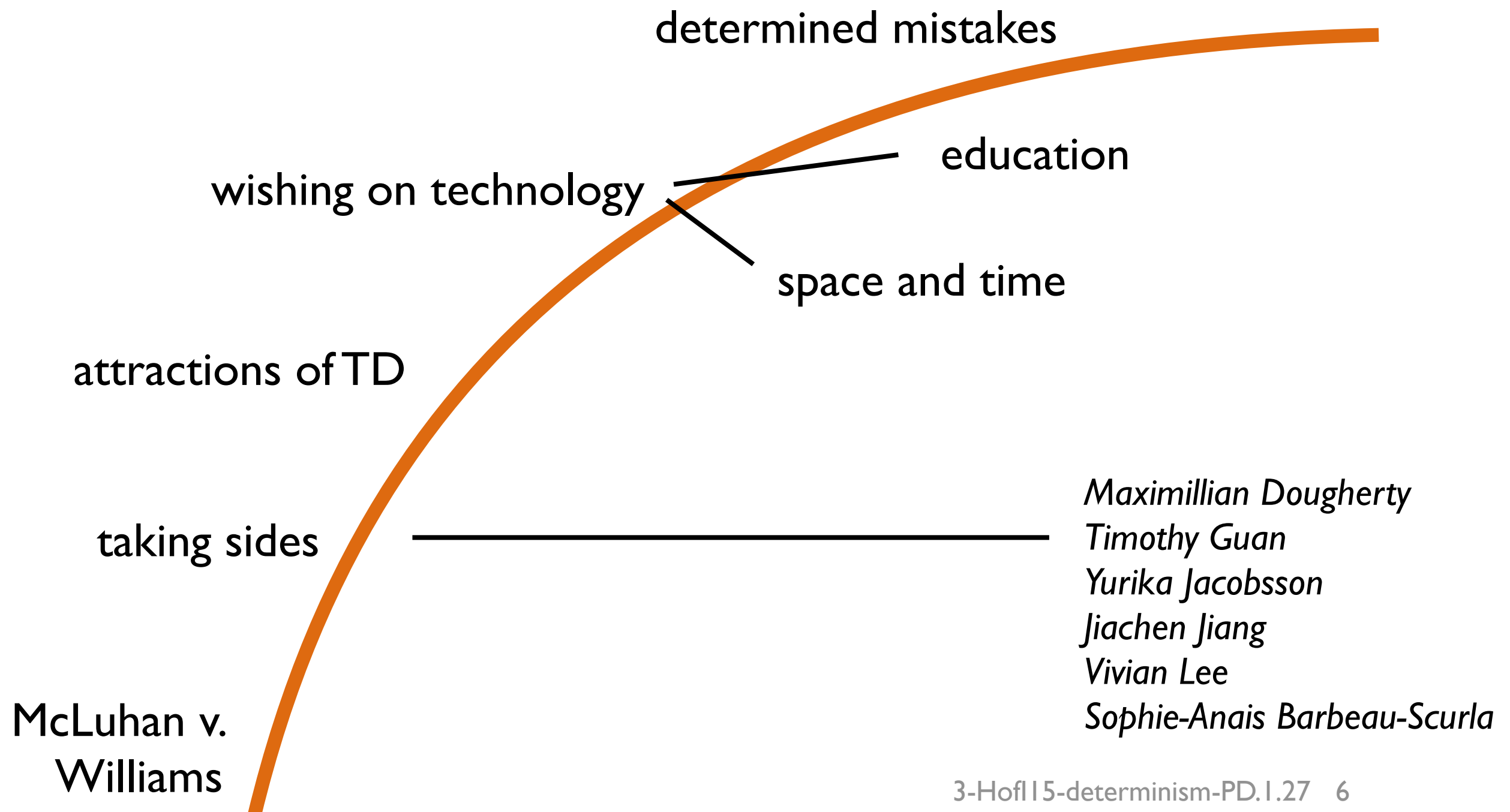


# overview



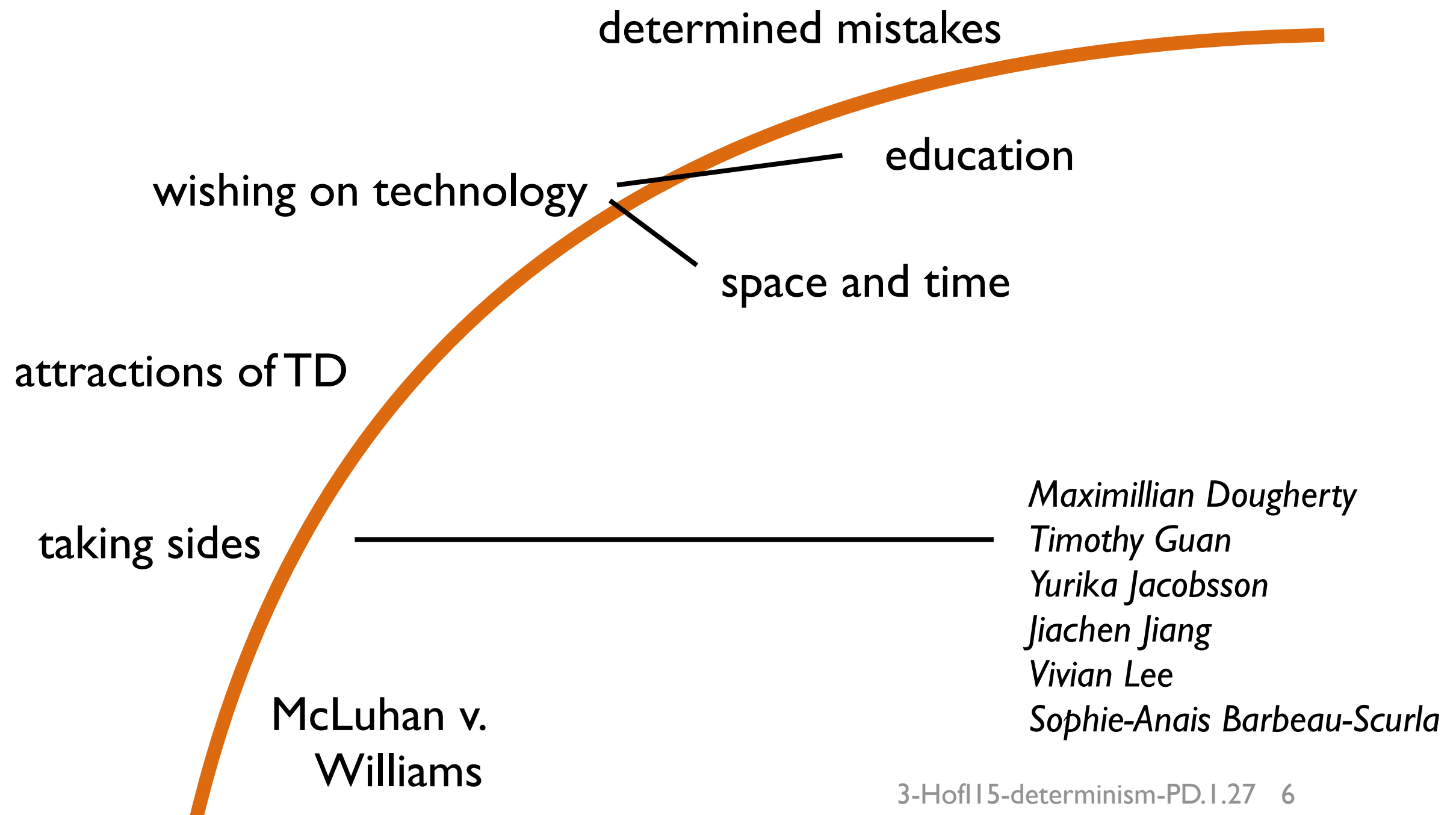


# overview





# overview





## McLuhan - 1964

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"very large structural changes in human outlook ...

"totally new environment ... the new electric Age of Information"

"Each new technology creates an environment ...

"abolishing both space and time ...

"final phase of the extensions of man...

a single consciousness ...

"Global Village

"By Plato's time the written word had created a new environment that had begun to detribalize man. Previously the greeks ... had memorized the poets."





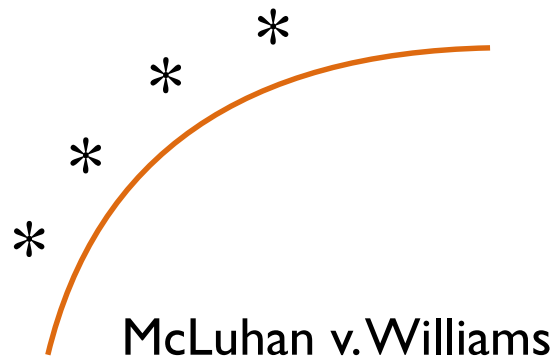
# without resistance

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## **determinism at its clearest**

"The railway ... created totally new kinds of city ..... This happened whether the railway functioned in a tropical or a northern environment, and is quite independent of freight or content.

"The spiritual and cultural reservations that the oriental peoples may have toward our technology will avail them not at all. The effects of technology do not occur at the level of opinions or concepts, but alter sense ratios or patterns of perception steadily and without any resistance."



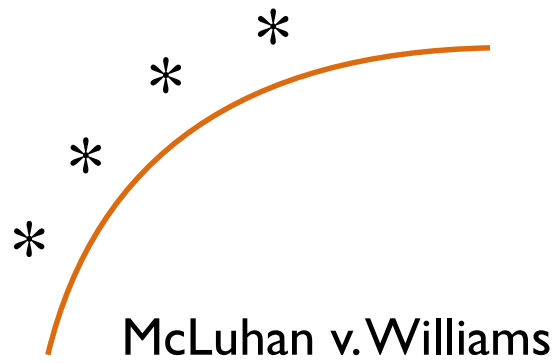
# conformism



"Science explores,  
Technology executes,  
Man conforms"

— *Chicago World's Fair, 1933*



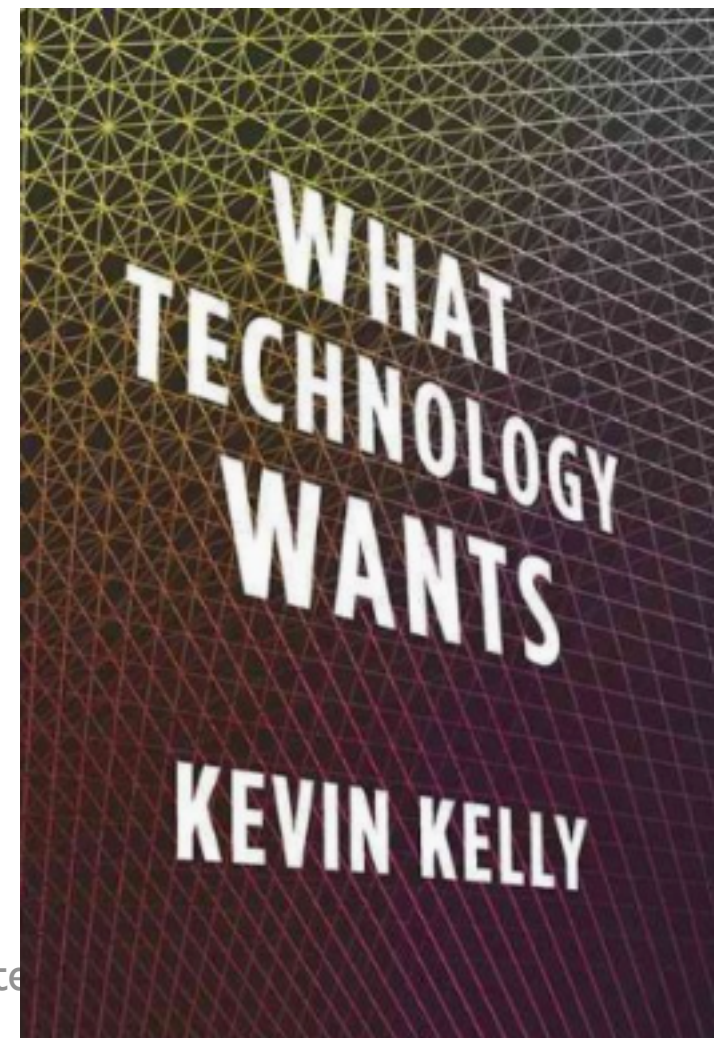


# conformism



"Science explores,  
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# Williams - 1974

Raymond Williams  
1921–1988

## **the invention of television**

"The invention of television was no single event ... electricity ... telegraphy ... photography... moving images ... radio ... broadcast ...

"centralisation of political power

"mobile, diffused society ...

"military, commerce, the press ...

"periods of crisis ..."





# Williams

## **what's wrong with determinism?**

"ratifies the society and culture we have now .... all other causes, all that men ordinarily see as history, are at once reduced to effects ....

"what are elsewhere seen as effects ...  
excluded as irrelevant

"welcomed by the 'media-men' ...

"gives the gloss of avant-garde theory  
to ... existing interests."



# determinist or symptomatic

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## **Television was invented ...**

- (i) ... altered all preceding media
- (ii)... altered ... institutions and ... social relations
- (iii)... altered our basic perceptions of reality
- (iv)... with other factors ... altered our societies

## **Discovered as a possibility, television ...**

- (v)... had unforeseen consequences
- (vi)... selected for investment to meet the needs of ... society
- (vii)... selected ... new and profitable phase of consumer society

## **Television became available ...**

- (viii)... exploited cultural and psychological inadequacy
- (ix)... served and exploited new needs



## what not

"technology is **not** marginal but central ...

"while we have to **reject** technological determinism ... we must be careful **not** to substitute .. .the notion of a determined technology ...

"Literacy has shown similar complications ... There was no way to teach a man to read the Bible which did not also enable him to read the radical press. A controlled intention became an uncontrolled effect."

coming up 2/19:  
literacy



# determined changes?

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

—Karl Marx, *Poverty of Philosophy*, 1847







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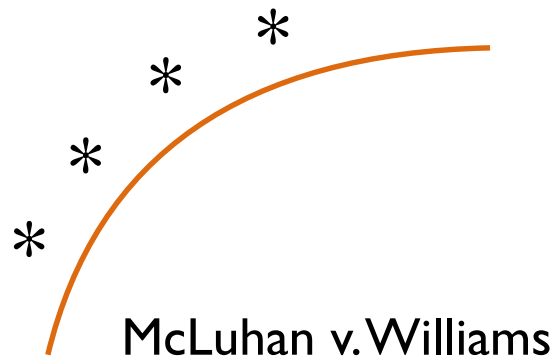
# determined changes?



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—Karl Marx, *Poverty of Philosophy*, 1847





# necessary or sufficient?

"Williams would rightfully point out that internet as a technology was not designed to cause this cultural appropriation, but he would be forced to recognize that the existence of the internet was **necessary** for this to occur."

—William Tokumaru

"... it is impossible to proceed to the age of the steam-mill until one has passed through the age of the hand-mill."

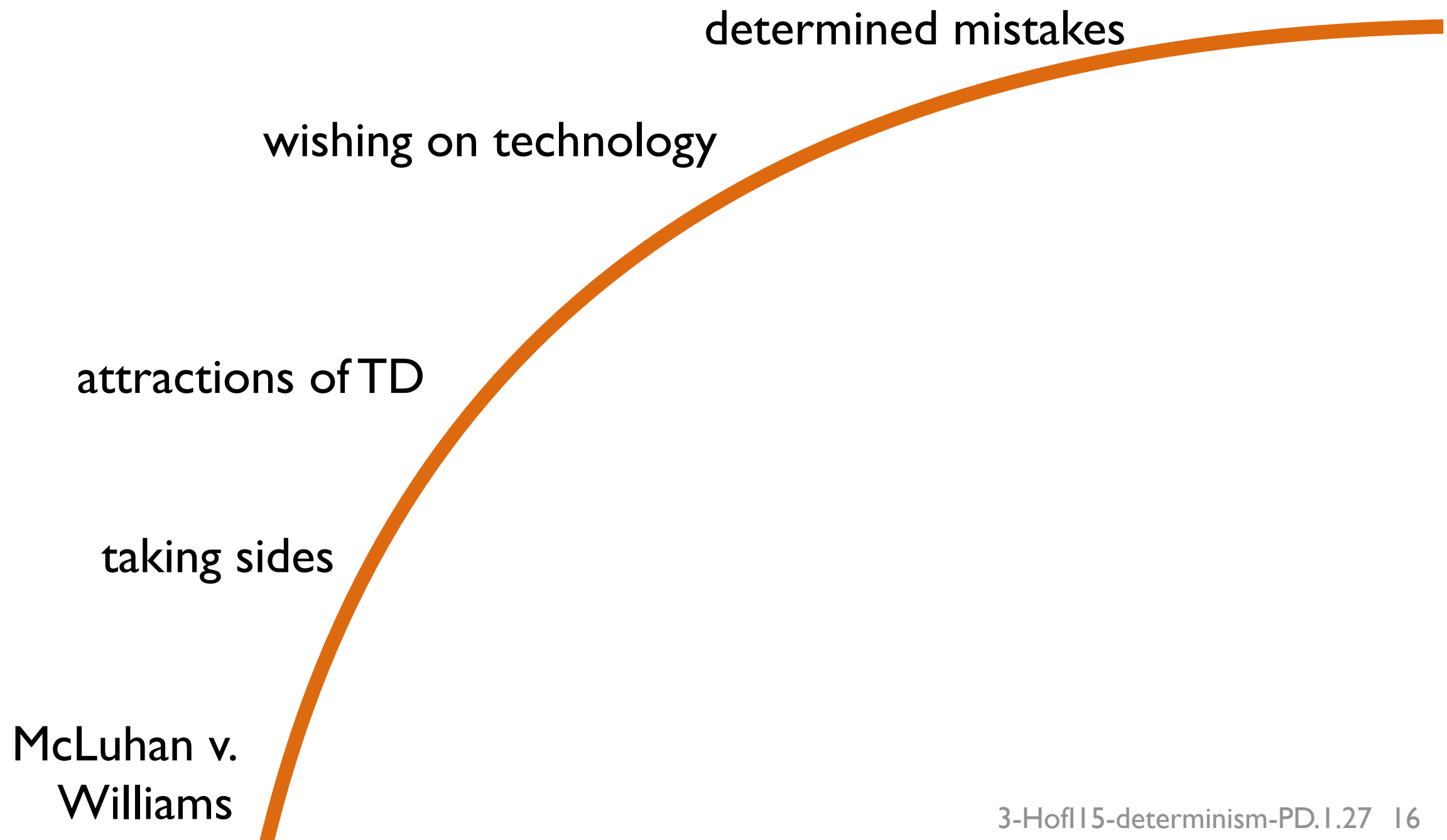
—Robert Heilbroner,  
"Do Machines Make History," 1994

[or] once you have the steam-mill, industrial capitalism is inevitable



# overview

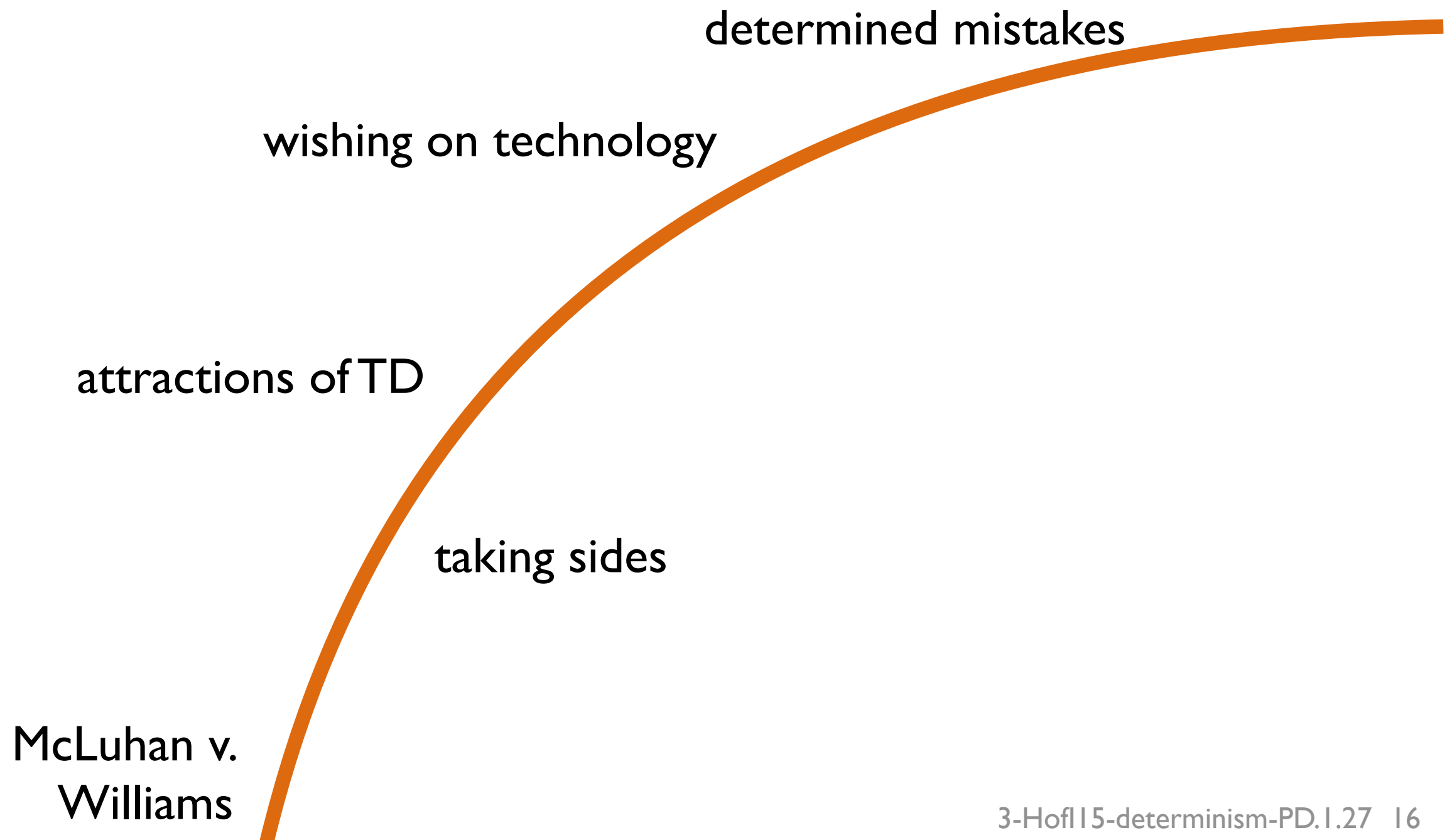
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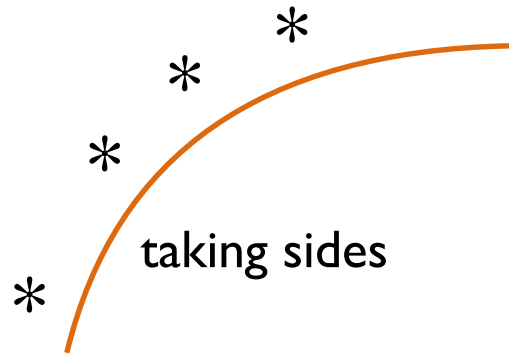




# overview

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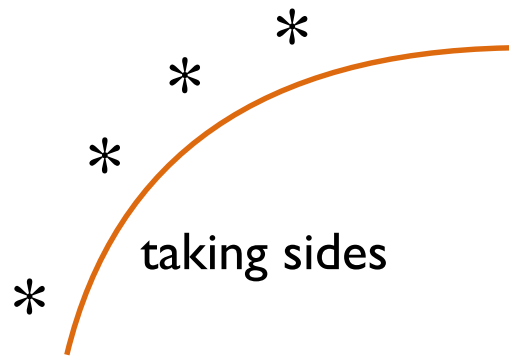


- answer the questions
- provide citations
- proofread your answer

## assignment

McLuhan writes that "any technology gradually creates a totally new human environment" [vi] and "any child can list the effects" [viii] of new technologies, which are "irresistible and unavoidable." Williams suggests that such a list would be "superficial" [9] or even "ludicrous" [121]. Choose a technology from a list a child might make today, discuss its assumed effects, and use it to argue either for McLuhan or for Williams.





# assignment

## answer the prompt

Williams suggests that ... such **lists** would be "superficial" or even "ludicrous". ...

argue either for McLuhan or for Williams.

## cite

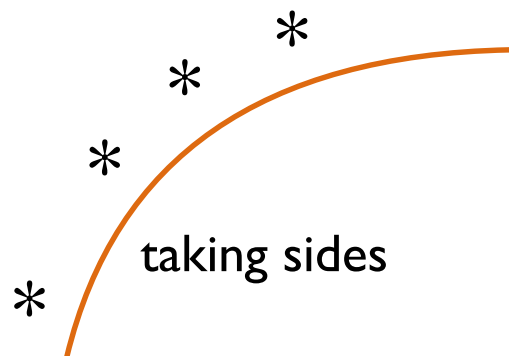
quotations

page numbers

references

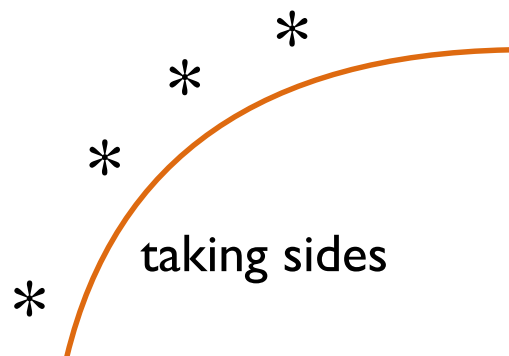
## wordcount

**deadline** —bCourses is unrelenting



cell/i/smartphone	19
<u>ipad/tablet</u>	12
internet	5
GPS	2
computer	2
television	2
telephone	2
<u>ipod</u>	1
automation technology	1
LCD TV	1
mobile computing	1
cloud	1
nightlight	1
IMAX	1
self-parking cars	1
Siri	1
Instagram	1
smartphone camera	1
touch screen	1
video-calling	1
<u>facebook</u>	1
Twitch	1
lightbulb/electric light	1
Google glass	1
Netflix	1
Youtube	1
twitter	1
Yelp	1

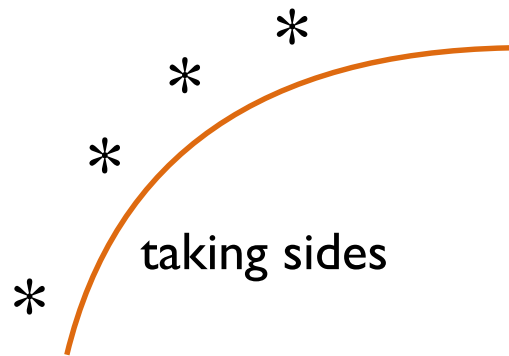
list



cell/i/smartphone	19
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internet	5
GPS	2
computer	2
television	2
telephone	2
<u>ipod</u>	1
automation technology	1
LCD TV	1
mobile computing	1
cloud	1
nightlight	1
IMAX	1
self-parking cars	1
Siri	1
Instagram	1
smartphone camera	1
touch screen	1
video-calling	1
<u>facebook</u>	1
Twitch	1
lightbulb/electric light	1
Google glass	1
Netflix	1
Youtube	1
twitter	1
Yelp	1

"The invention of television was no single event"

list



# divide and conquer

**McLuhan** -- it's the medium that does it **45%**

**Williams** -- no it's not **48%**



**maybe; maybe not: -- 7%**



## it's determined

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although sextants and compass' have allowed skilled users to estimate their position on Earth, **GPS** has made this information unprecedentedly accessible and accurate. This development made personal navigation practical and even eliminated the need for a "sense of direction". This offload of a long existing requirement is then the "message" of the technology. "For the 'message of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs" (McLuhan 8) Therefore, the list cannot be, as William states, "superficial".

—Maximillian Dougherty



## it's determined

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I personally support the more orthodox perspective, as advocated by Marshall McLuhan, that technologies such as **Instagram** have a direct effect on social behavior. Not only do I find the suggestion that some aspect of human nature drove the conception of social photo sharing technology difficult to swallow, but I believe the degree to which Instagram has affected our lexicon is evidence to the cause-effect relationship of technology on social behavior.

—*Timothy Guan*



# it's determined

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[Williams's] causes sound random and illogical whereas if technology is the cause, then we can see the logical effects of that technology [**i.e., smartphone camera**]. Furthermore, technology develops so rapidly now that technology has to be the cause.

—Yurika Jacobsson





# it's not

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McLuhan's statement that technology, "...gradually creates a totally new human environment" (1964, vi) fails to acknowledge the role that society plays in shaping the development of new technologies by addressing already existent needs (Williams, 1974). Additionally a child listing the effects of the **iPad** provides a "superficial" (1974, p. 1) and arguably pointless analysis. Whilst technology does drive social change and cultural values, so does society propel the creation of new technologies. Williams argues that, "... other social groups... will adopt and develop the technology, often with different purposes and effects." (1974, p. 123) For example, the iPad was originally conceived as an eReader for personal use but was quickly adopted by businesses, such as medical professionals checking health records during patient examinations.

*Sophie-Anais Barbeau-Scuria*



# it's not

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In Williams' words, **smart phones** were a "controlled intention [that] became an uncontrolled effect". Williams' deeper analysis of technology as a cause and effect provides greater depth and understanding of technology altering our society as a whole in comparison to McLuhan's view of technology as just the agent of change.

—Vivian Lee

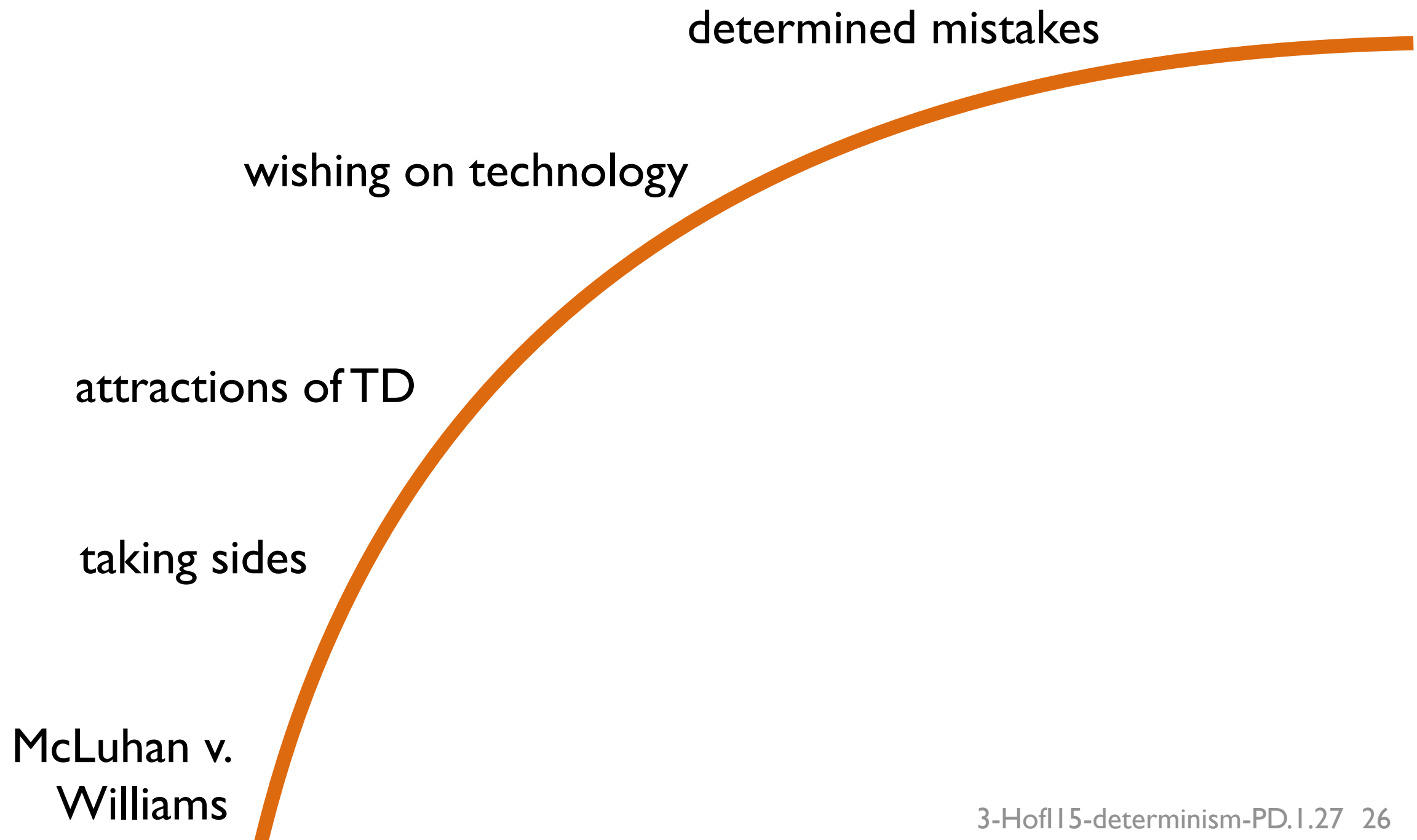
Merely talking about how technologies [**e.g., the computer**] change the human society without considering the social and cultural background is truly "superficial."

—Jiachen Jiang



# overview

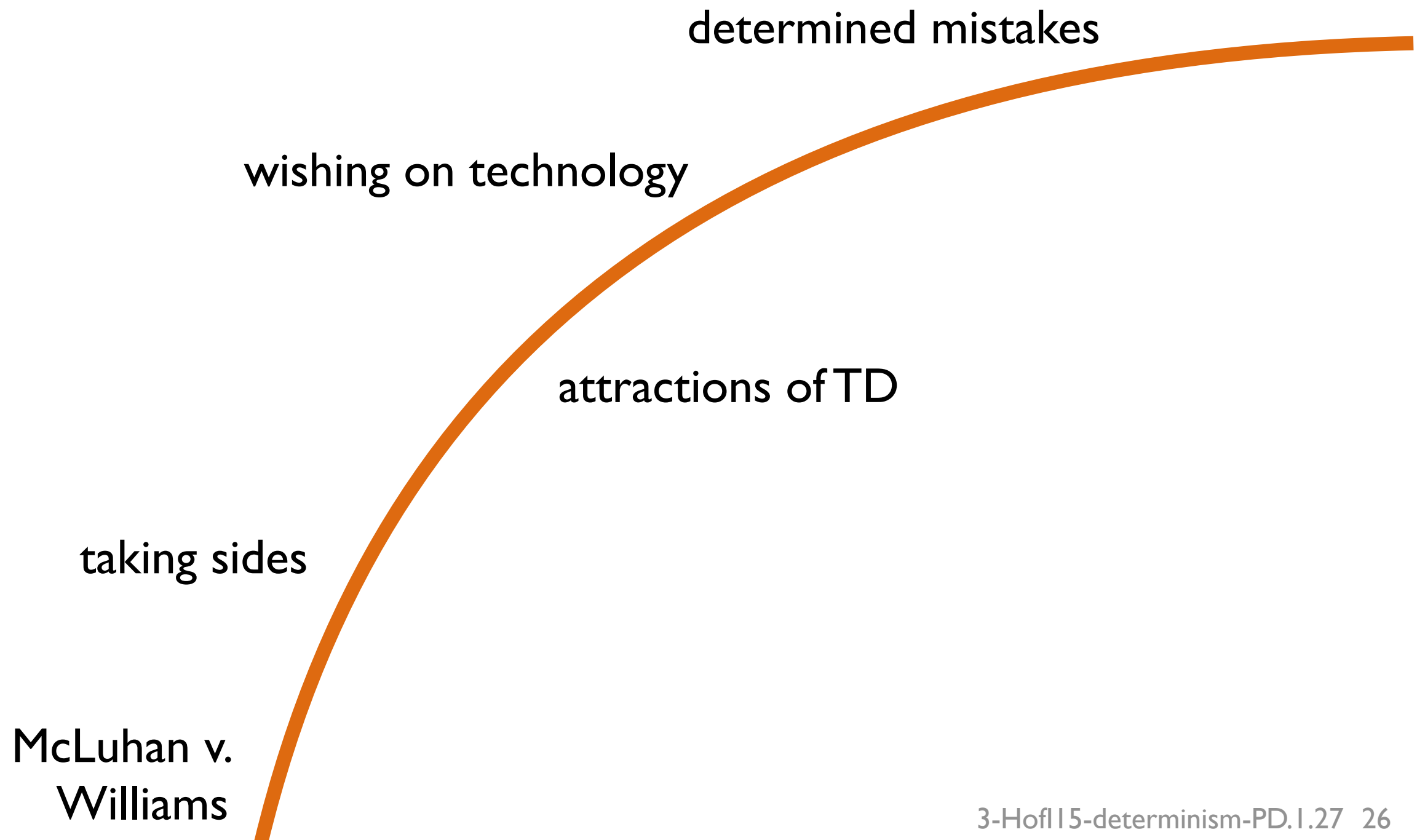
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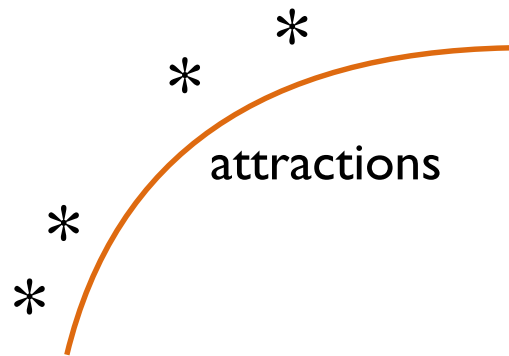




# overview

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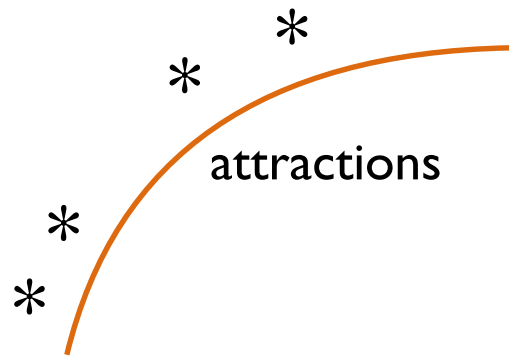


easy work



**looking back**

just look at Cleopatra's nose



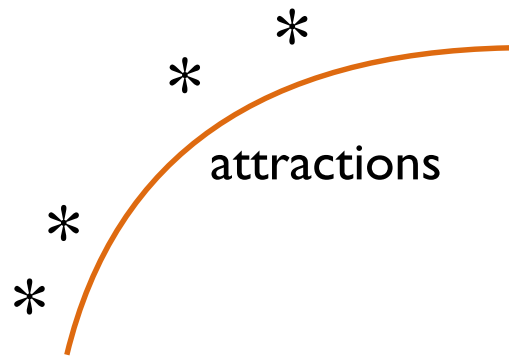
# easy work



## looking back

just look at Cleopatra's nose

"all for the want of a horseshoe nail"



easy work



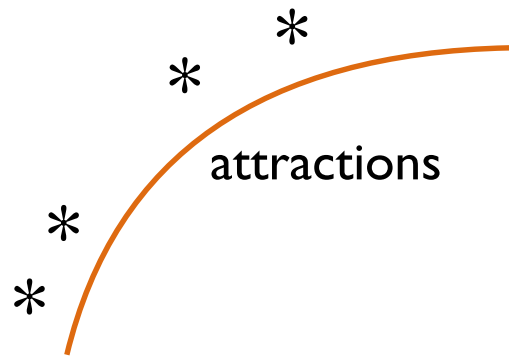
**looking back**

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"all for the want of a horseshoe nail"

**looking forward**





# easy work



## looking back

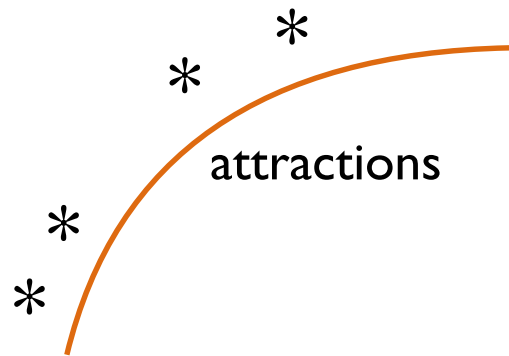
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## looking forward

“These technologies are inevitable.

Inevitability is not a flaw. ... makes predictions easier.”



# easy work



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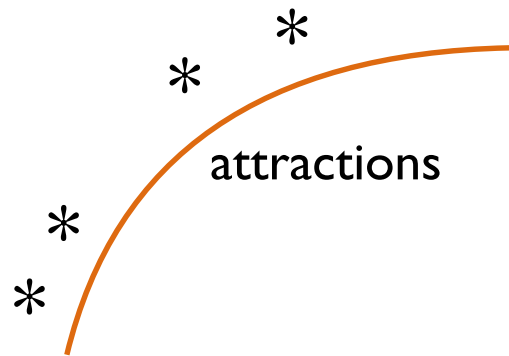
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—Kevin Kelly, *What Technology Wants*, 2010



# easy work



## looking back

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## looking forward

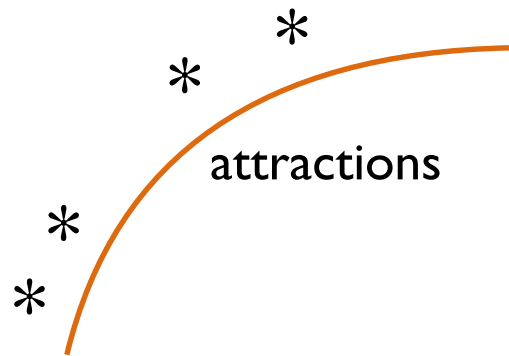
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coming up:  
print revolution



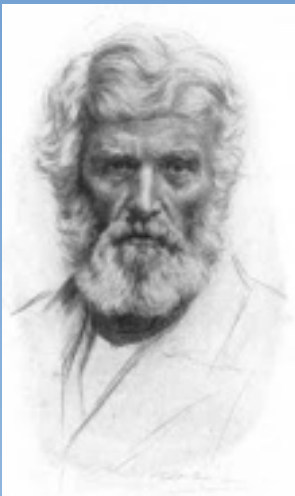
## easy history?



Francis Bacon  
1561–1626

"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

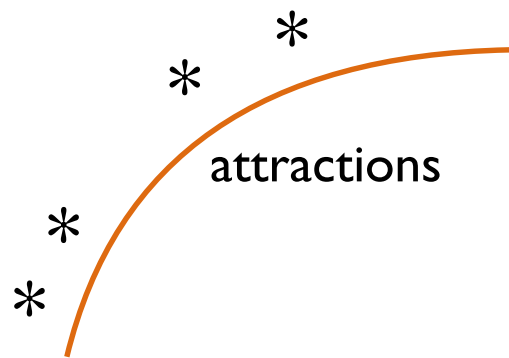


Thomas Carlyle  
1795–1881

"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 at ourselves

## **the inevitable product of progress**

"Westward the course of empire takes its way"

John Gast  
"American  
Progress"  
1872





# hostages to fortune



## 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







## Crise au Monde : la directrice Natalie Nougayrède annonce sa démission

CRÉÉ : 14-05-2014 12:34

CRISE - Une semaine après la démission de plusieurs rédacteurs en chef adjoints, la directrice de la rédaction jette l'éponge. Elle a expliqué n'avoir plus la "sérénité nécessaire" d'assurer ses fonctions et d'entreprendre un large plan de transformation.

# hostages to fortune



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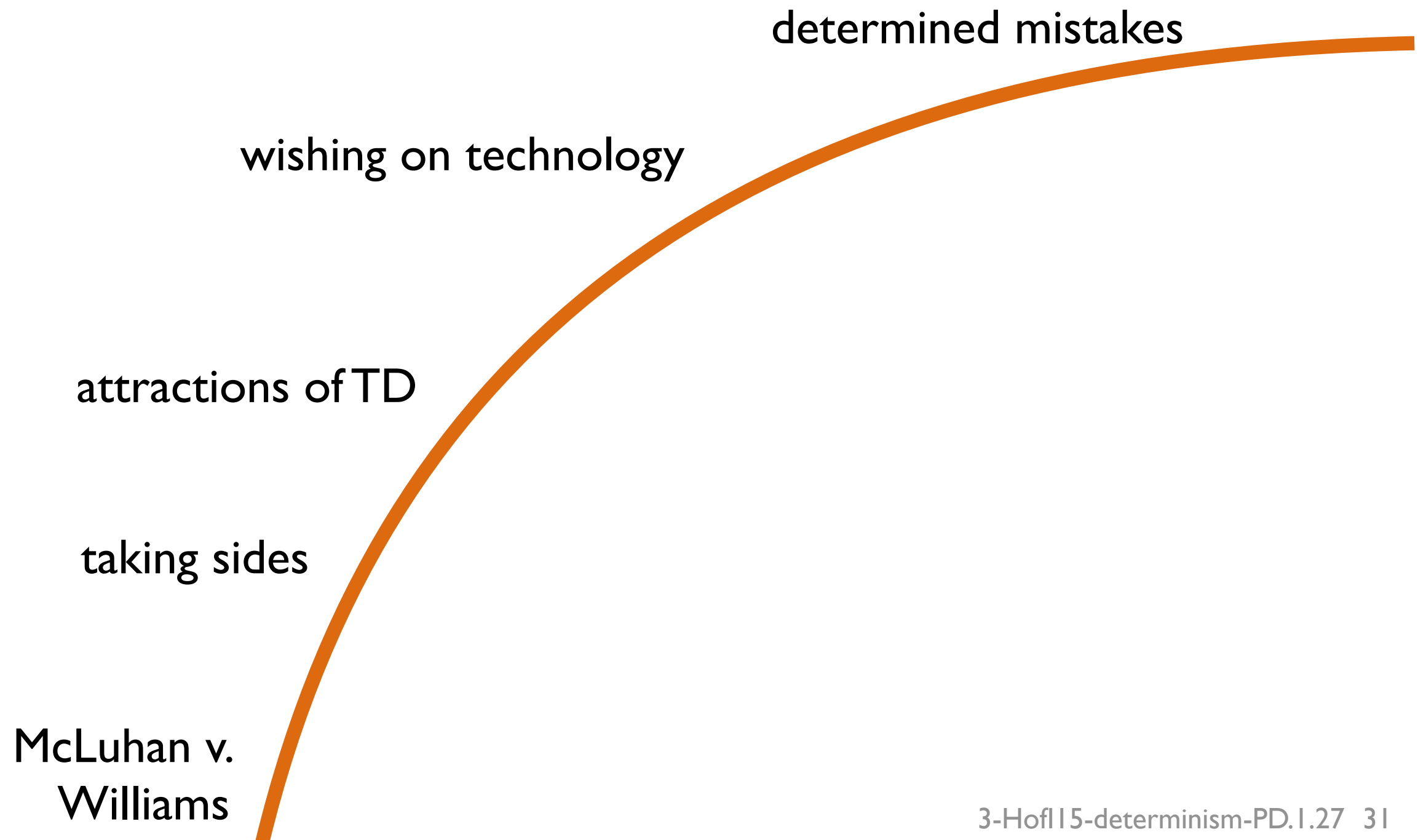
– Emile Zola, *Le Ventre de Paris*





# overview

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# overview

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determined mistakes

wishing on technology

attractions of TD

taking sides

McLuhan v.  
Williams



# overview

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determined mistakes

wishing on technology

space & time

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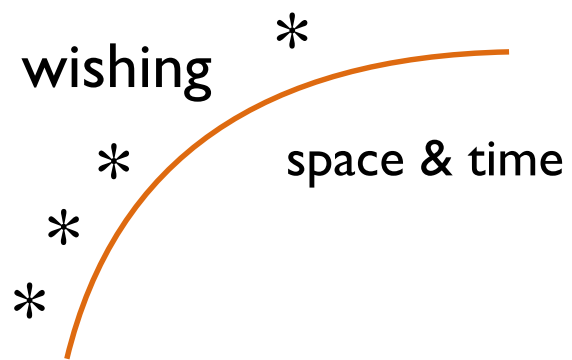
## in your words

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"Distance in space and time in relationships are eliminated. ... This new environment is one where one can share experiences with others immediately regardless of distance in space.

"Along with the elimination of space and time of communication between those at any distance apart, the cellphone also added the innovation of portability."

"It has served as a bridge for time and space; downsizing a large detached globe to more of a "small village"



"communication might be considered instantaneous."

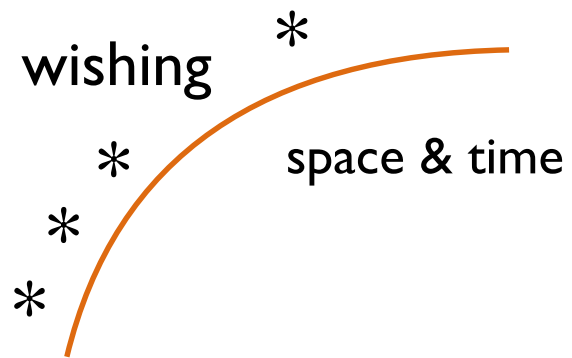
## electrical sublime



"Electric circuitry has overthrown the regime of 'time' and 'space' and pours upon us instantly and continuously concerns of all other men ... 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 Massage*, 1967





## it makes a village

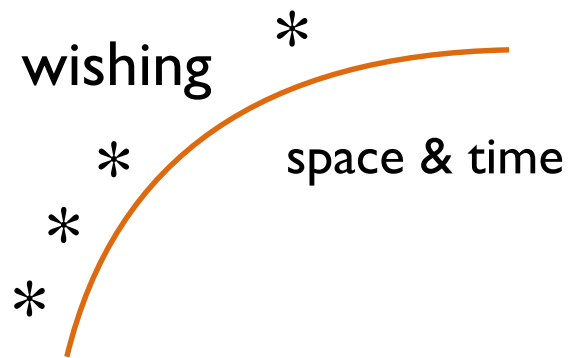


"abolishing both space and time ... eliminate time and space factors in human association .. creating involvement in depth.

... compels commitment and participation ... wholeness, empathy and depth of awareness

[in contrast to] partial and specialized .. viewpoint"

*McLuhan*



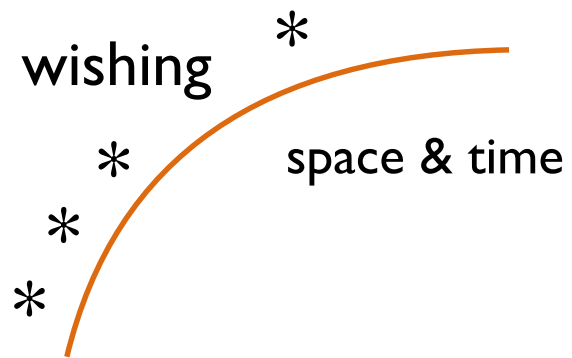
# sea to shining sea



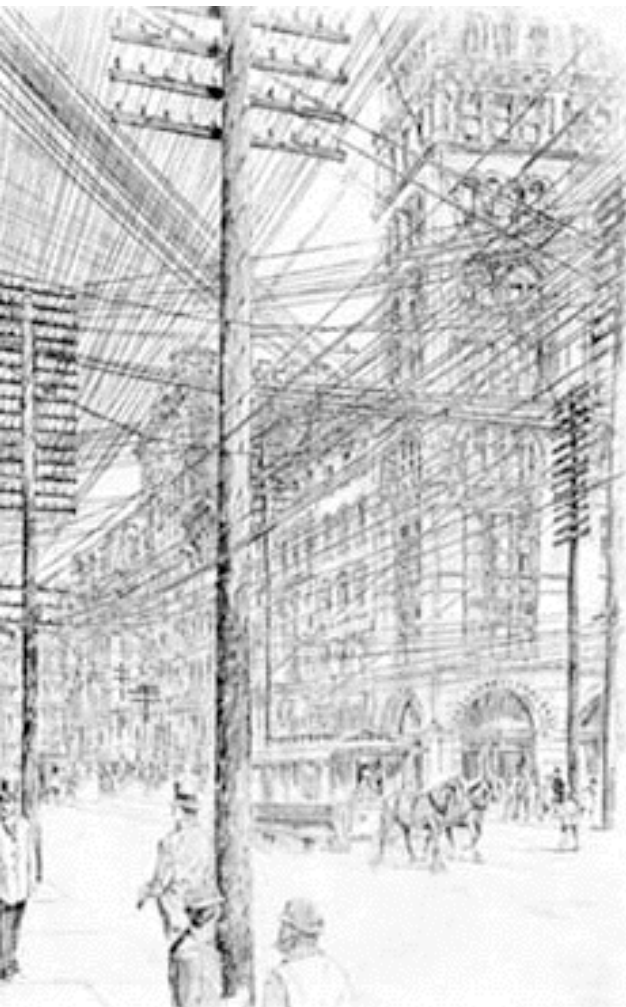
## and tech to shining tech

"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*

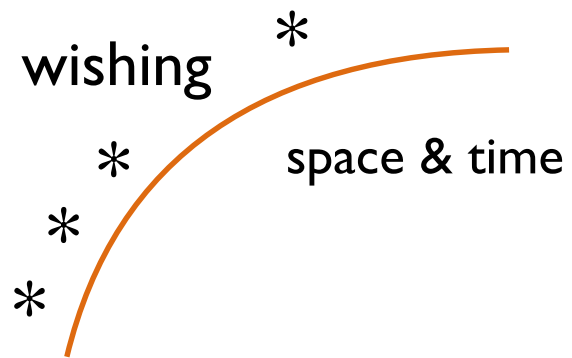


# revealing assumptions



"A line of telegraph ... from London to Kurrachee, and from thence to every part of India, ... intelligence and commands [can] 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"

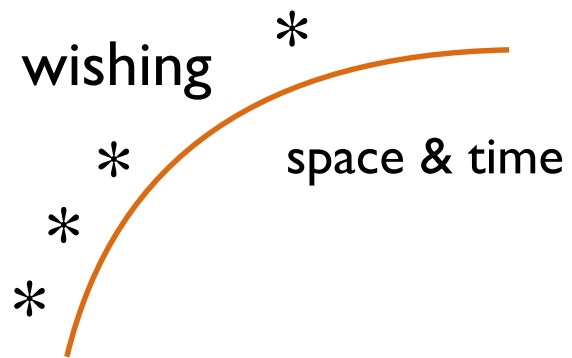
*—Blackwood's Edinburgh Magazine, 1857*



# wishing up a grand future

## what and when?

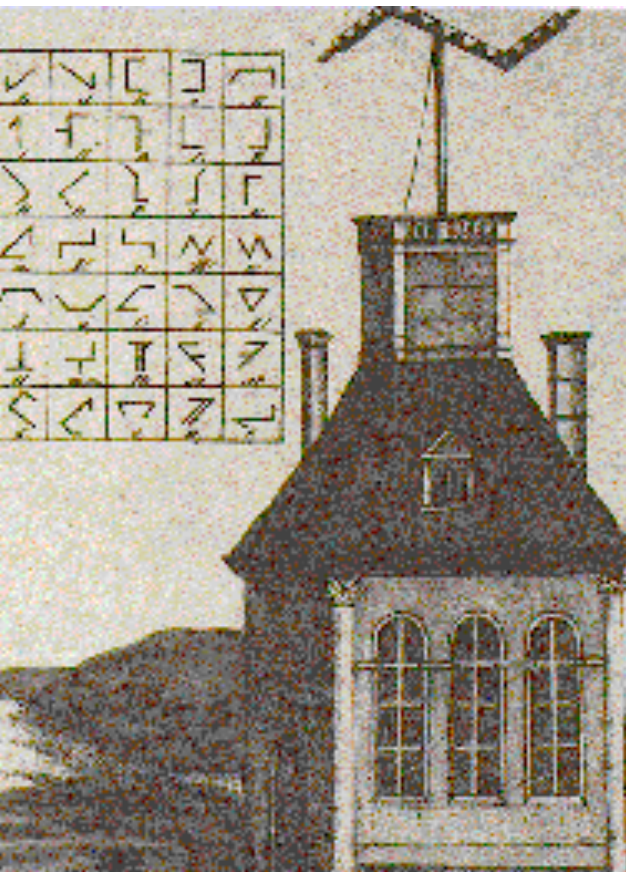
"at bottom, this invention might suffice to make possible the establishment of democracy among a large population ... no reason why it would not be possible for all the citizens of France to communicate their will ... in such a way that this communication might be considered instantaneous."



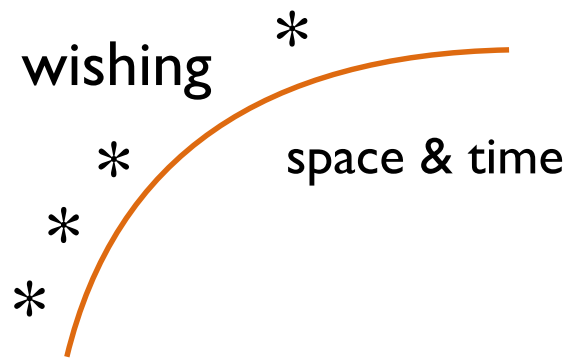
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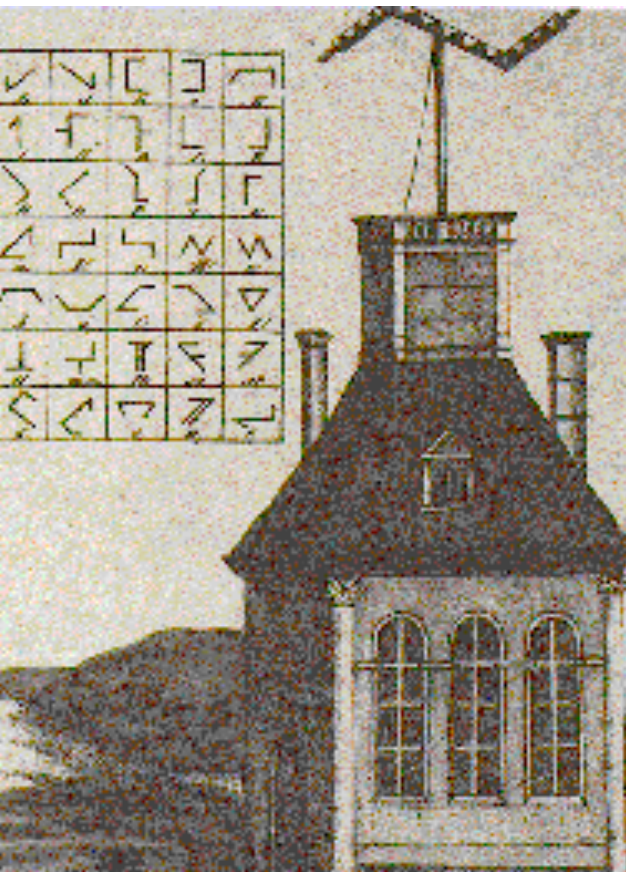


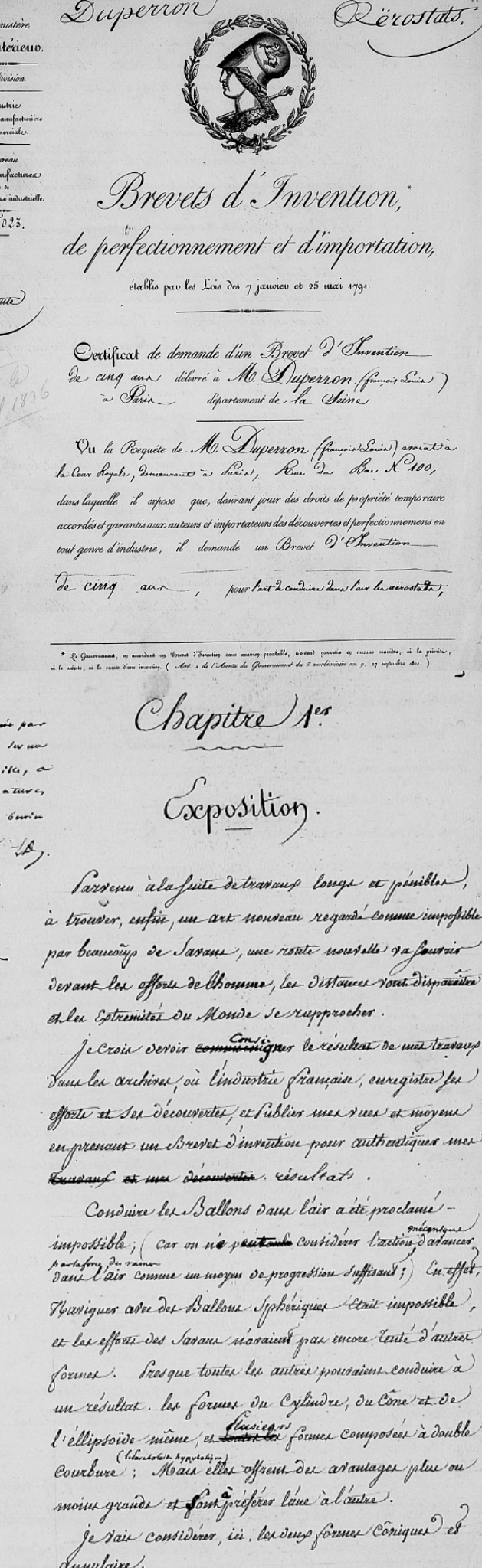
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– Alexandre Vandermond, 1795



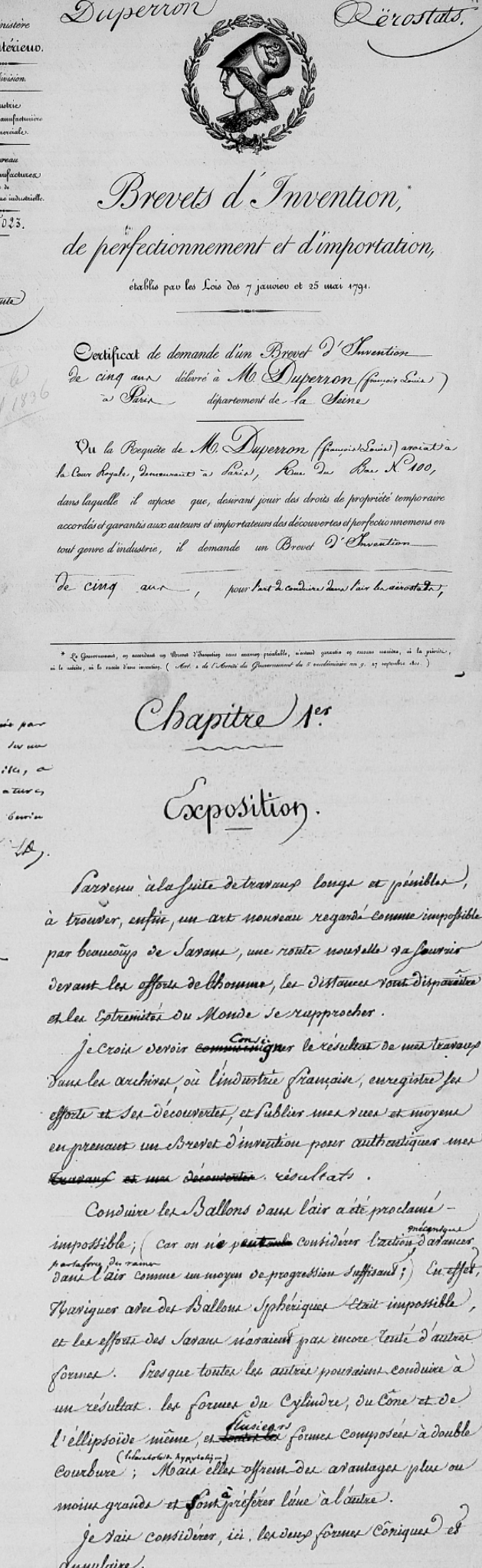


# getting together

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

Brevet d'Invention, 1791





# getting together

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





wishing \*  
\*  
\*  
\* space & time

evidently not a  
“determined technology”

The battle of  
Fleurus, June  
26, 1794





wishing \*  
\*  
\*  
\* space & time

evidently not a  
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The battle of  
Fleurus, June  
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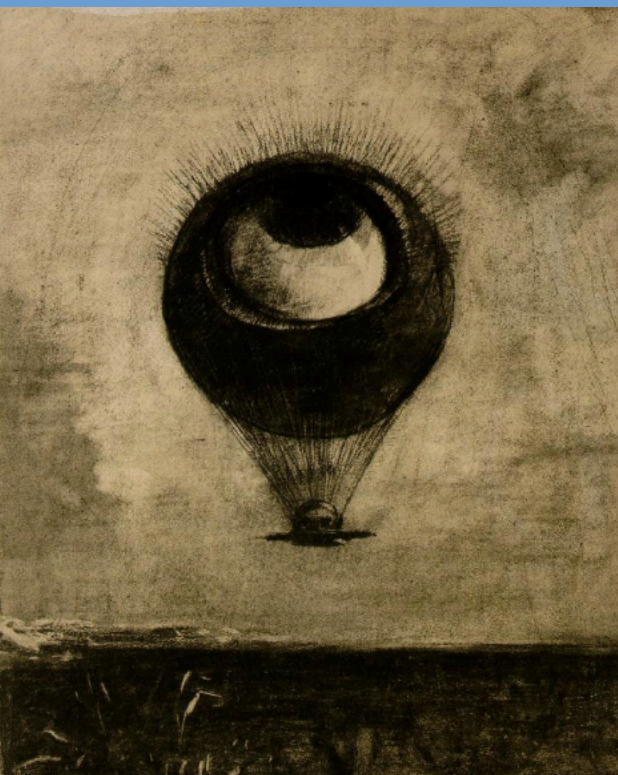




wishing \*  
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The battle of  
Fleurus, June  
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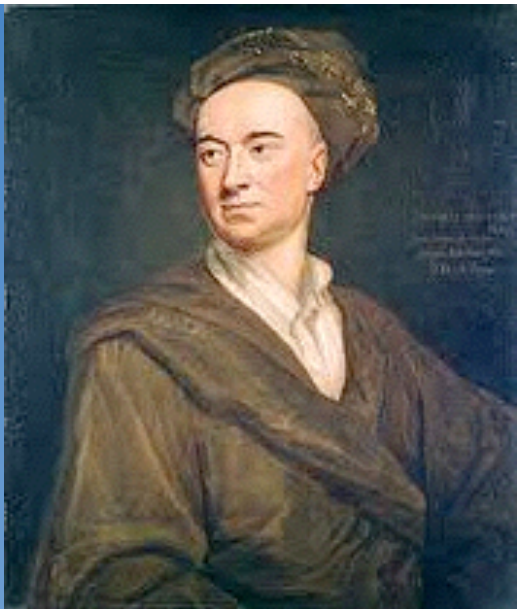
# wishful thinking?

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

Swift, Pope, Arbuthnot, 1728

"... no stock phrase in the entire lexicon of  
progress appears more often."

--Leo Marx,  
*The Machine in the Garden*, 1964



wishing \*  
\*  
\*  
\* space & time

# democratic anxiety?



James W. Carey  
1934–2006



"Freedom of Speech"  
Norman Rockwell

"From the outset a key discourse of American life has entertained different and contradictory notions of the practice of communication—one that derives from modern advances of the printing press and transportation and one that is situated within the ancient theory and practice of the voice ... symbolized ... by the uneasy juxtaposition of assembly, speech, and press in the First Amendment."

James W. Carey,  
*Communication as Culture: Essays in Media and Society*, 1989





# overview

---

determined mistakes

wishing on technology

easy history/  
easy futurism?

taking sides

McLuhan v.  
Williams



# overview

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determined mistakes

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easy history/  
easy futurism?

taking sides

McLuhan v.  
Williams



# overview

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determined mistakes

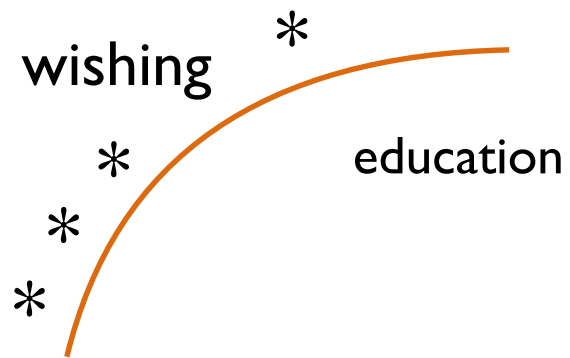
wishing on technology

education

easy history/  
easy futurism?

taking sides

McLuhan v.  
Williams



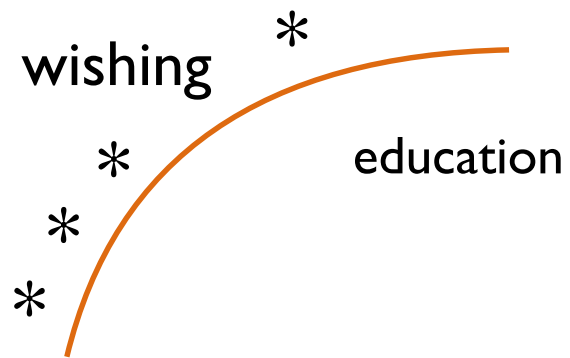
# think MOOCs

"Long before the year 2000, the entire antiquated structure of degrees, majors and credits will be a shambles."

Alvin Toffler, *Future Shock*, 1970

"we are entering the new age of education that is programmed for discovery rather than instruction."

McLuhan



## heard it before



Vicesimus Knox  
1752–1821

"[A]s books are now multiplied, and men able to afford instruction dispersed all over the kingdom, it is evident that the principal cause of establishing universities in an age when both books and instructors were scarce, no longer subsists. Let them therefore be reformed, and rendered really useful to the community, or let them be deserted."

Vicesimus Knox,  
*Liberal Education*,  
1781



wishing education

## going back

"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

not Aristotle, but Plato  
(**P**rogrammed **L**anguage for  
**A**utomated **T**eaching  
**O**perations).



# Patrick Suppes, Pioneer in Computerized Learning, Dies

By JOHN MARKOFF DEC. 2, 2014



Patrick Suppes in 1981.

Almost a decade before the invention of the personal computer, Patrick Suppes, a Stanford philosopher, sketched a vision of the future of computerized education.

"In a few more years," he predicted in 1966, "millions of schoolchildren will have access to what Philip of Macedon's son Alexander enjoyed as a royal prerogative: the personal services of a tutor as well informed and as responsive as Aristotle."

Dr. Suppes, who died on Nov. 17 at 92, was not just prescient, however; he was also instrumental in bringing about the future he foresaw — one in which students would have instant access to vast stores of knowledge through their computerized "tutors."

## going back

"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

not Aristotle, but Plato  
(**P**rogrammed **L**anguage for  
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wishing \*  
\*  
\*  
\* education

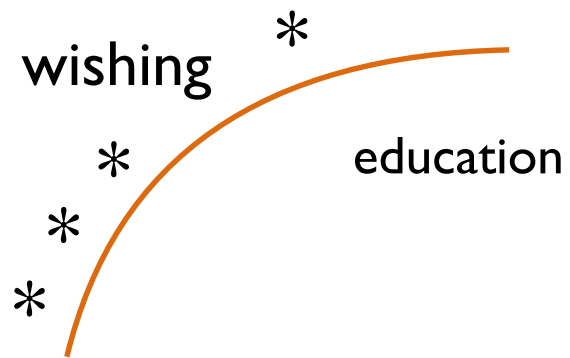
and back



## **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, 1915



# earlier thoughts

## it takes a book

"The village schoolmaster communicates to his pupils the power of using an instrument by which not merely the best of their living countrymen, but the greatest and wisest men of all countries and all times, may become their instructors."

Charles Babbage, *Ninth Bridgewater Treatise*, 1837



wishing \*

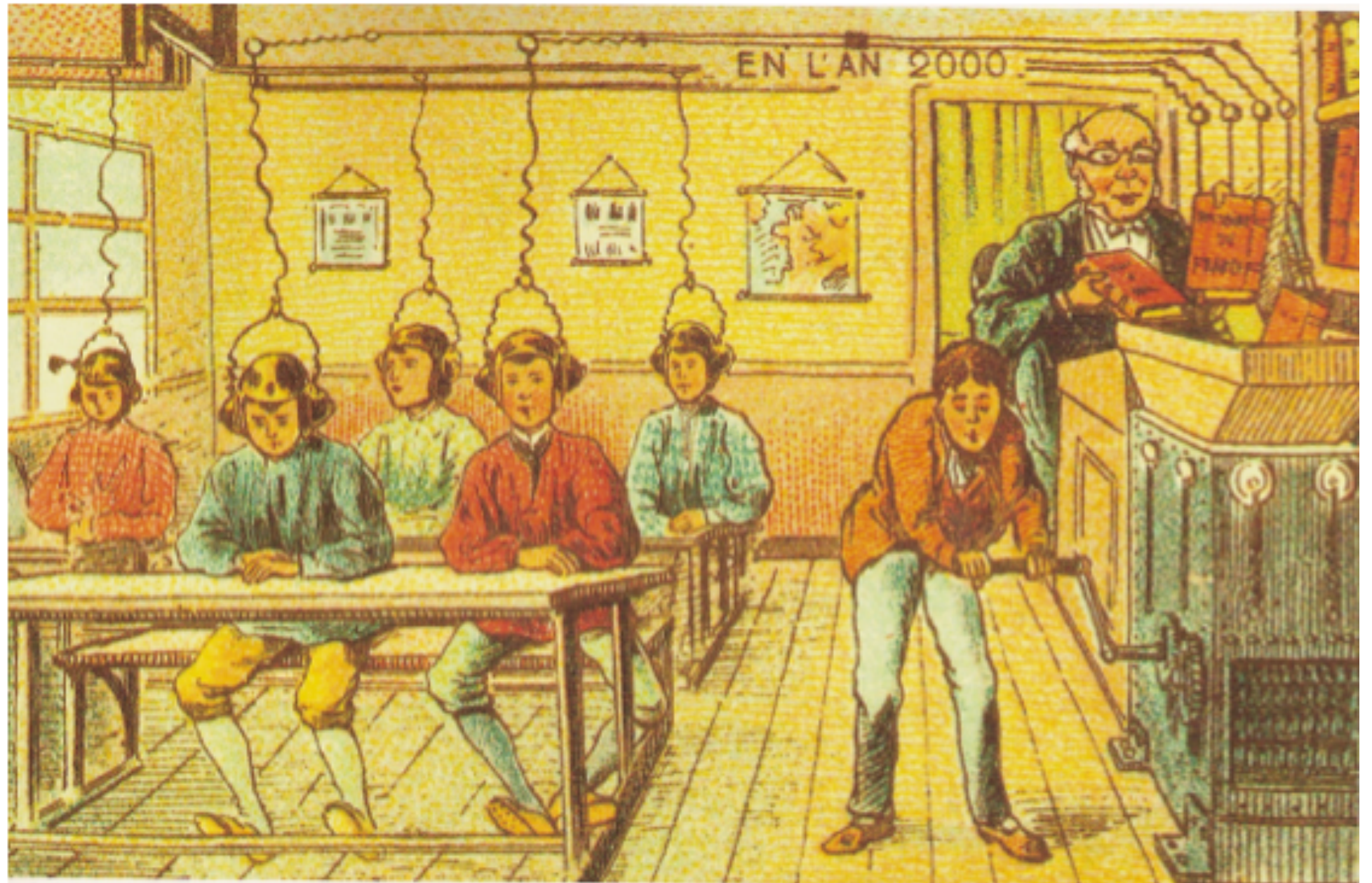
\*

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education \*

# beyond the book

**in the year 2000**





wishing \*

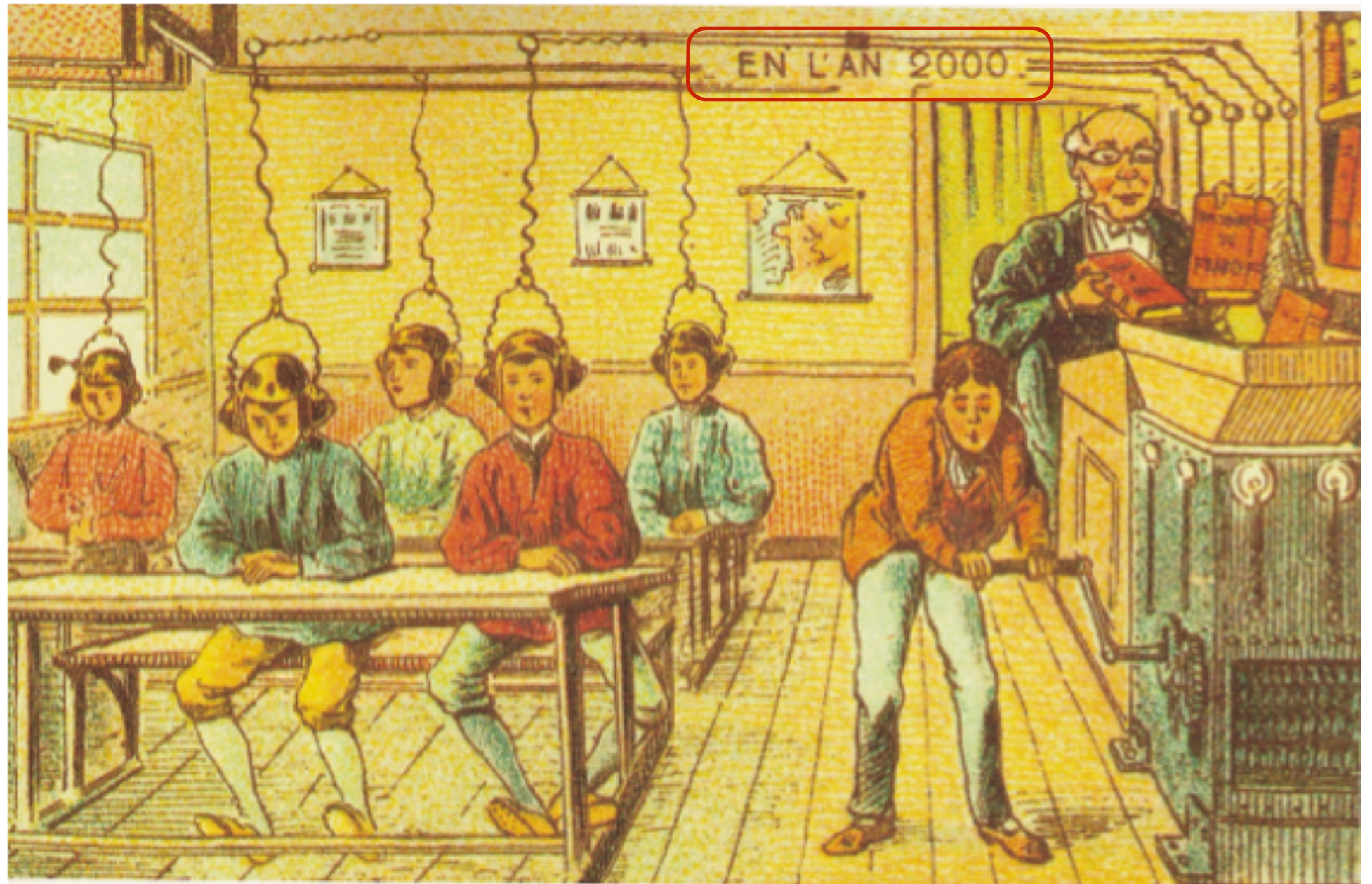
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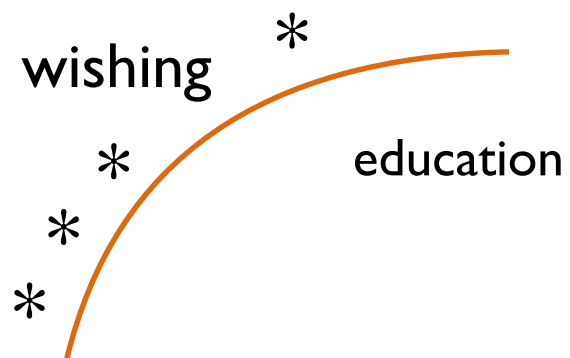
education \*

# beyond the book

**in the year 2000**







# IBM's solutions



**Grandfather:**  
Well, I finally finished my  
doctoral thesis.

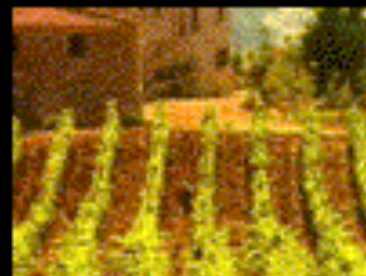


**Woman:**  
Way to go, Gramps.



**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.



# overview

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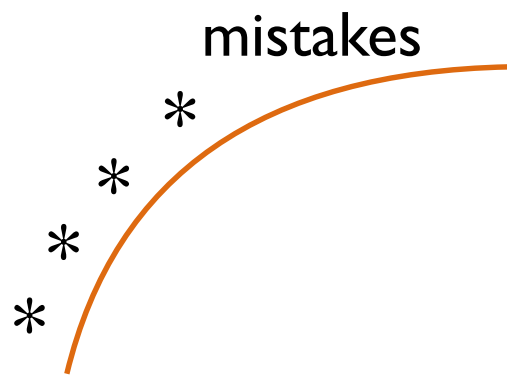
determined mistakes

wishing on technology

easy history/  
easy futurism?

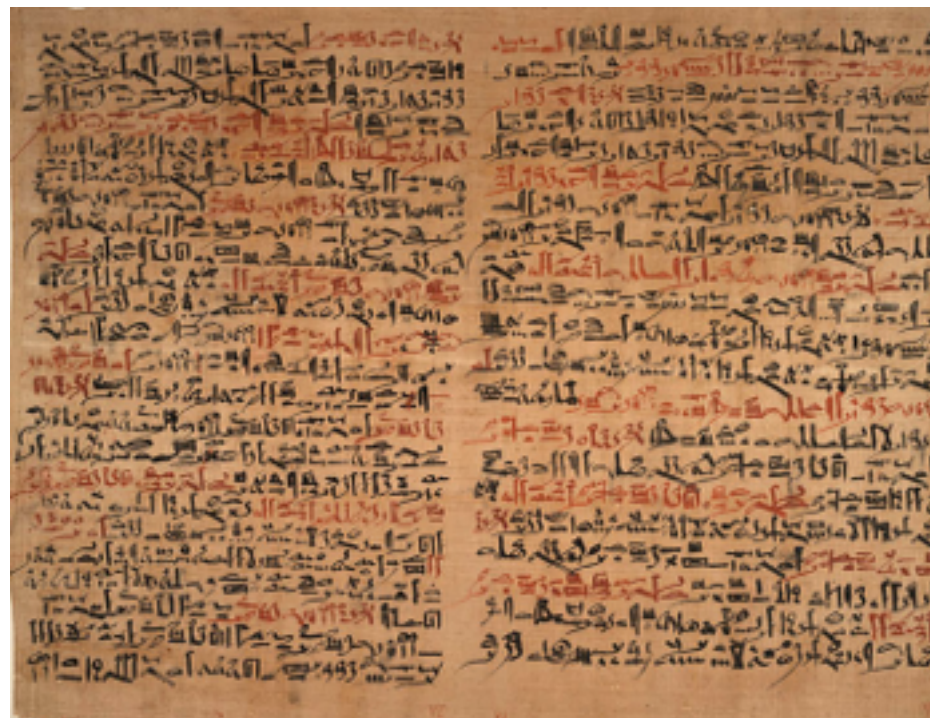
ing sides

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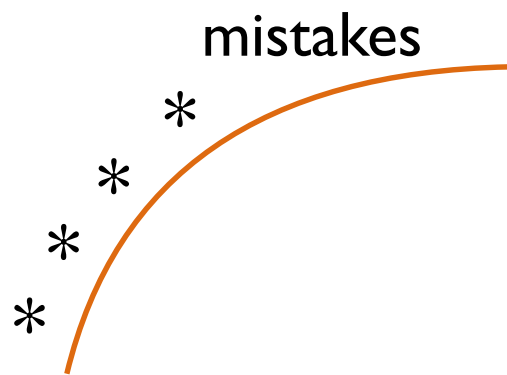


# trivializing the past

coming up  
2/10:  
print  
revolution



"Ceci tuera ..."



# bad predictions

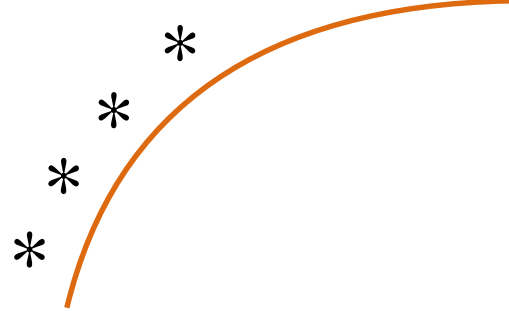
**searching for  
the last ... ?**





"Ceci tuera ..."

mistakes



# bad predictions

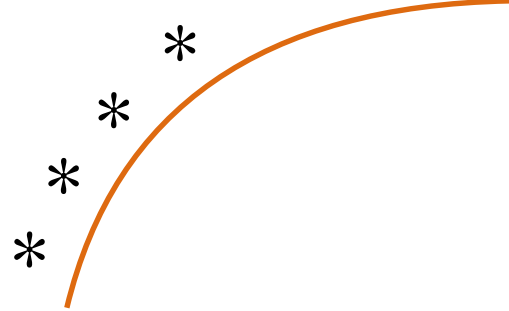
There are persons who can write not illegibly in pencil, but are as enigmatical as Rufus Choate or Horace Greeley when they take up the pen. There are persons too lazy to resort to ink and pen who can conquer their besetting sin enough to make a few dabs with a pencil. Living must have been more laborious 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.

## searching for the last ... ?



"Ceci tuera ..."

mistakes



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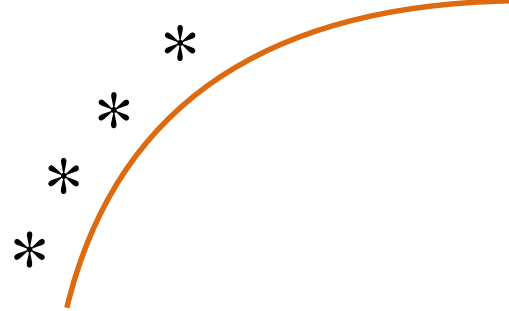
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New York Times  
1938

"Ceci tuera ..."

mistakes



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the last ... ?**

New York Times  
1938



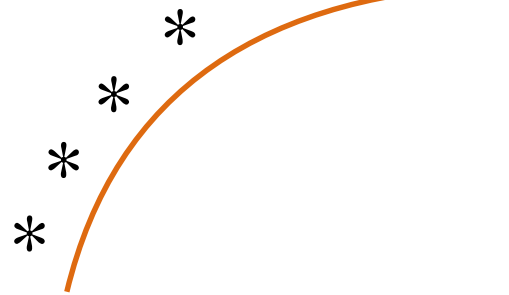
Kremlin security agency to buy typewriters



Russia's agency responsible for the Kremlin security is buying typewriters - a move reportedly prompted by recent leaks by WikiLeaks and Edward Snowden.

"Ceci tuera ..."

mistakes



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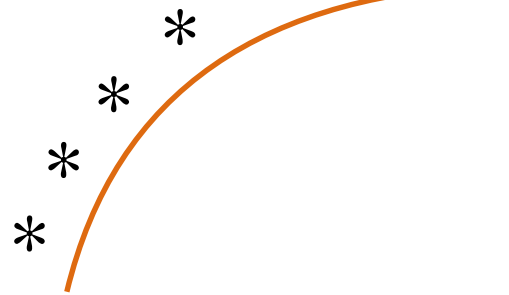
3-Hofl15-deter 52



"Ceci tuera ..."

# bad predictions

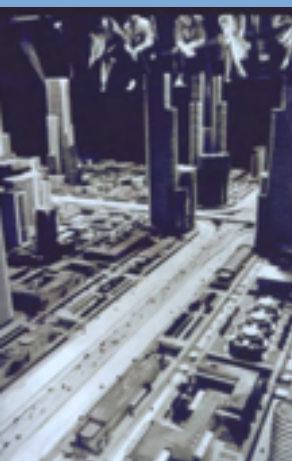
mistakes



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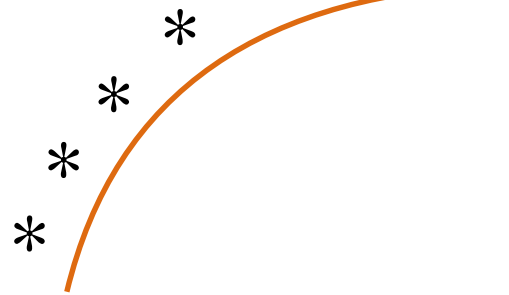
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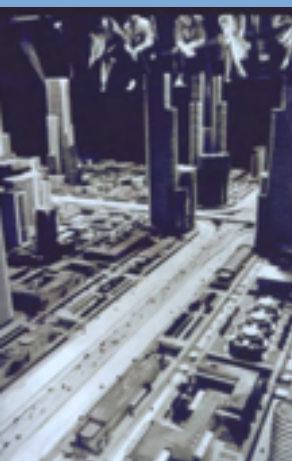
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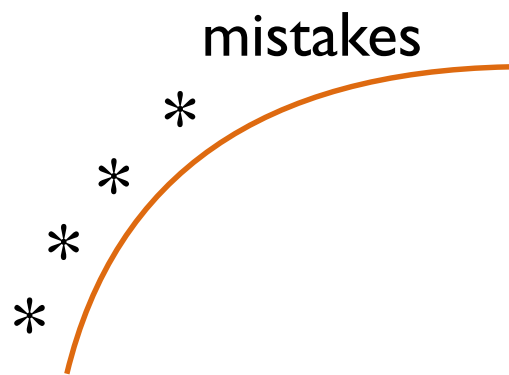
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3-Hofl15-deter 52



# constraint vs resource

coming up  
2/17, 3/3:  
newspaper,  
telegraph







# necessary or sufficient?



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HOME TECHNOLOGY SCIENCE ENTERTAINMENT BUSINESS UNBALANCE

## Arab Spring really was social media revolution

Posted on September 13, 2011 - 06:00 by **Kate Taylor**

After analyzing more than three million tweets, gigabytes of YouTube content and thousands of blog posts, a new study has concluded that the Arab Spring truly was fueled by social media.



"Our evidence suggests that social media carried a cascade of messages about freedom and democracy across North Africa and the Middle East, and helped raise expectations for the success of political uprising," says Philip

Howard, an associate professor in communication at the University of Washington.





# necessary or sufficient?

## Mubarak's sons released from Egypt prison: prison officials

REUTERS 12 hours ago



CAIRO (Reuters) - The sons of deposed Egyptian president Hosni Mubarak were released from prison on Monday, prison officials said, a day



Gamal (L) and Alaa Mubarak, sons of former Egyptian President Hosni Mubarak, stand behind bars during ...

**TG DAILY**

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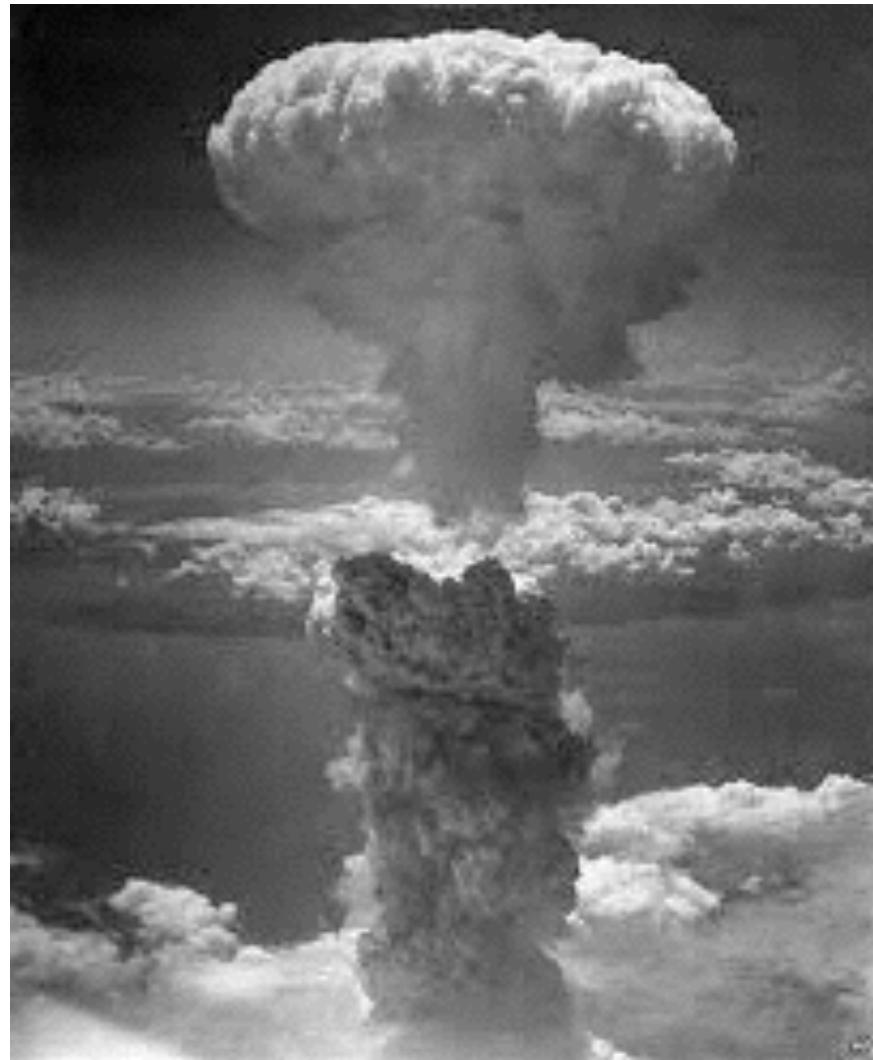
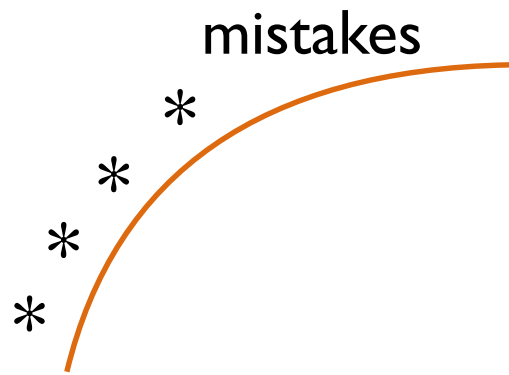
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1914: War to end all wars

1945: Weapon to end all weapons

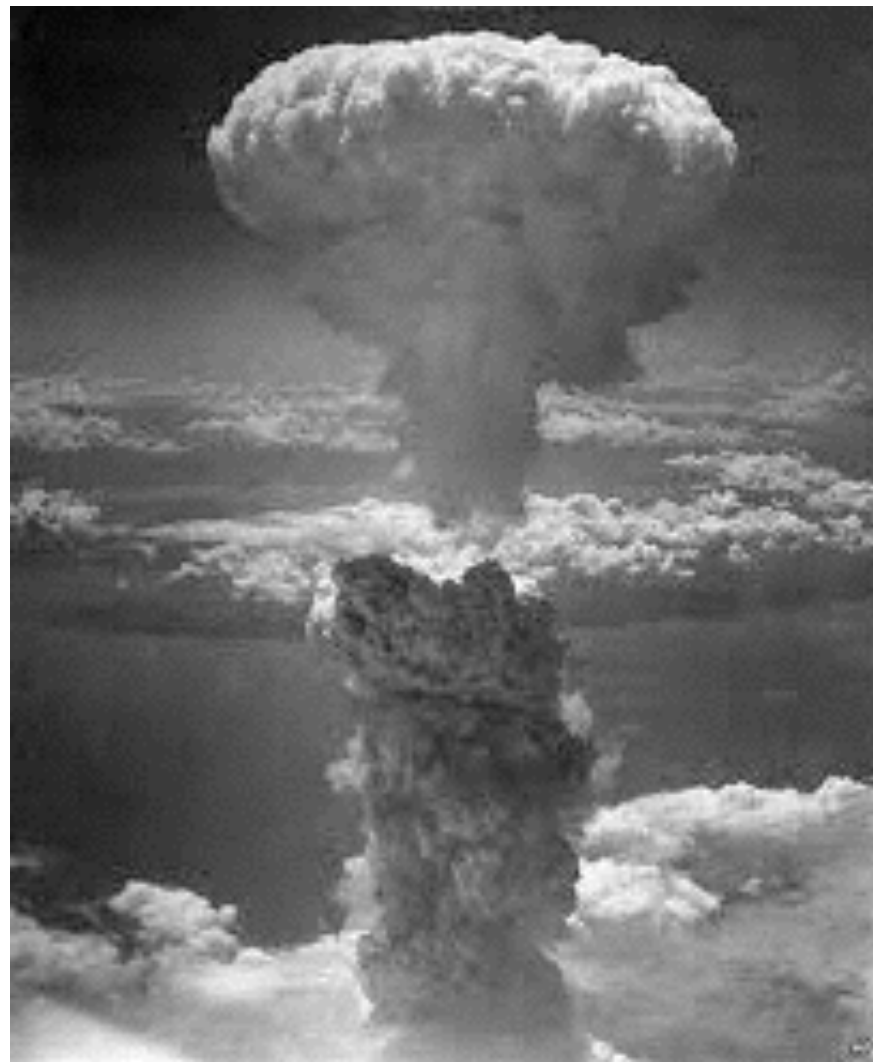
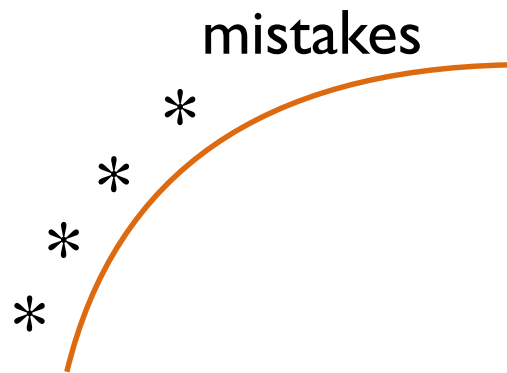
backing the wrong horse



1914: War to end all wars

1945: Weapon to end all weapons

backing the wrong horse



Kalashnikov, Creator of AK-47, Dies at 94

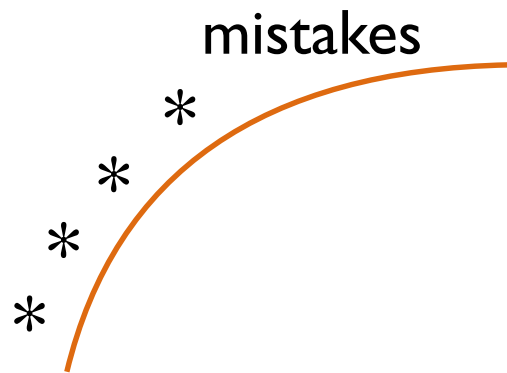




1914: War to end all wars

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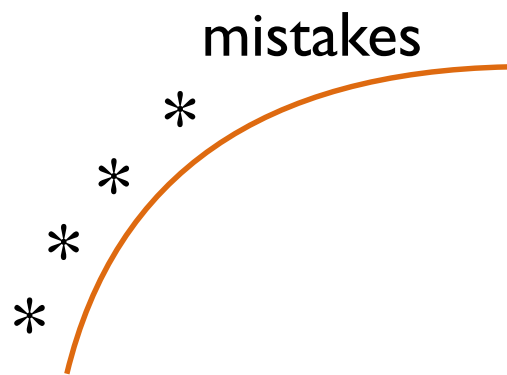
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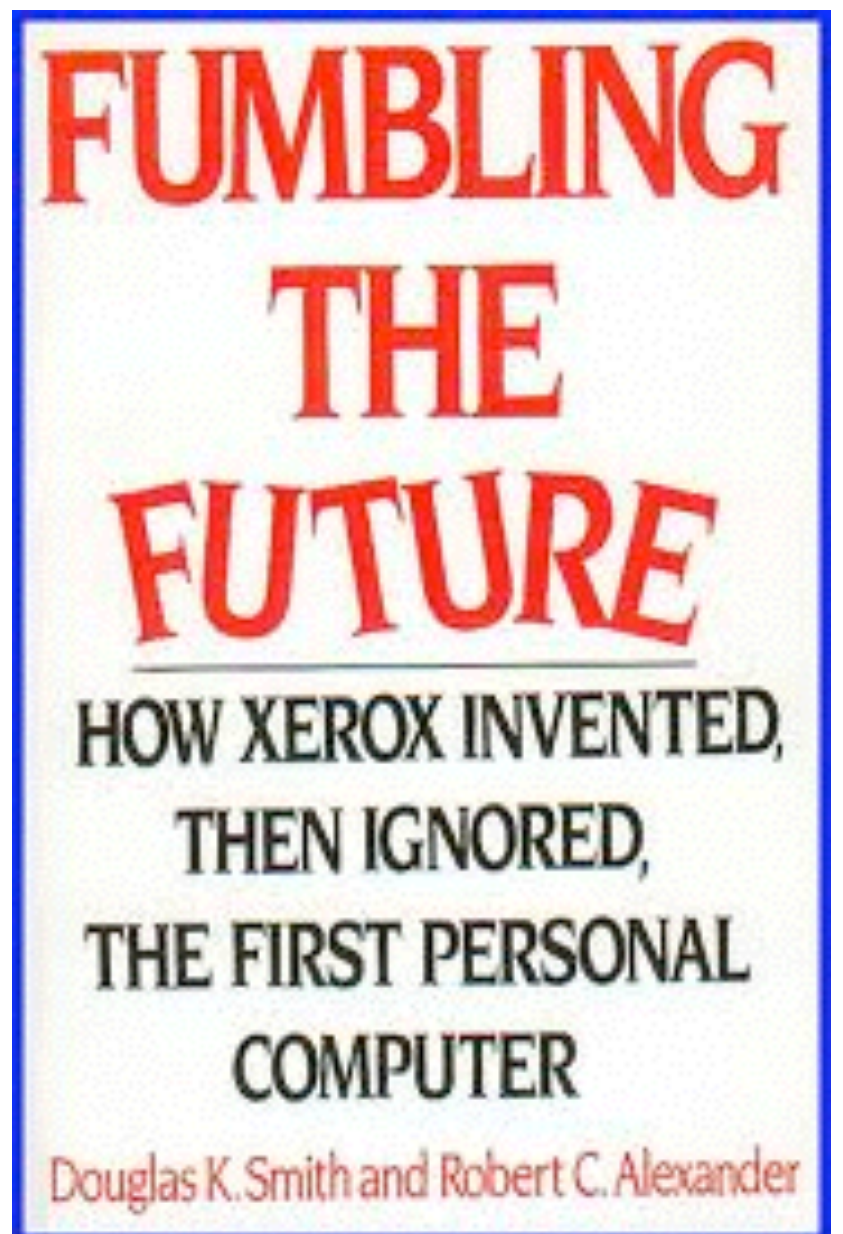


1976-2003

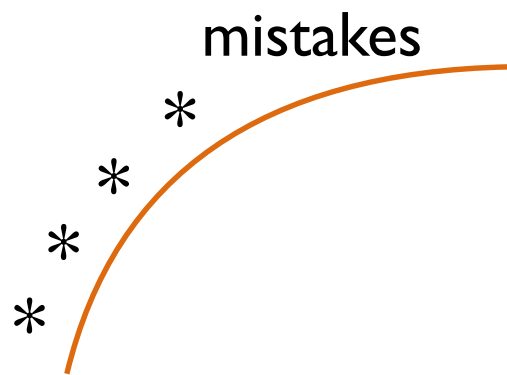


# leaving it all to the horse

coming up 4/7:  
computer  
revolution

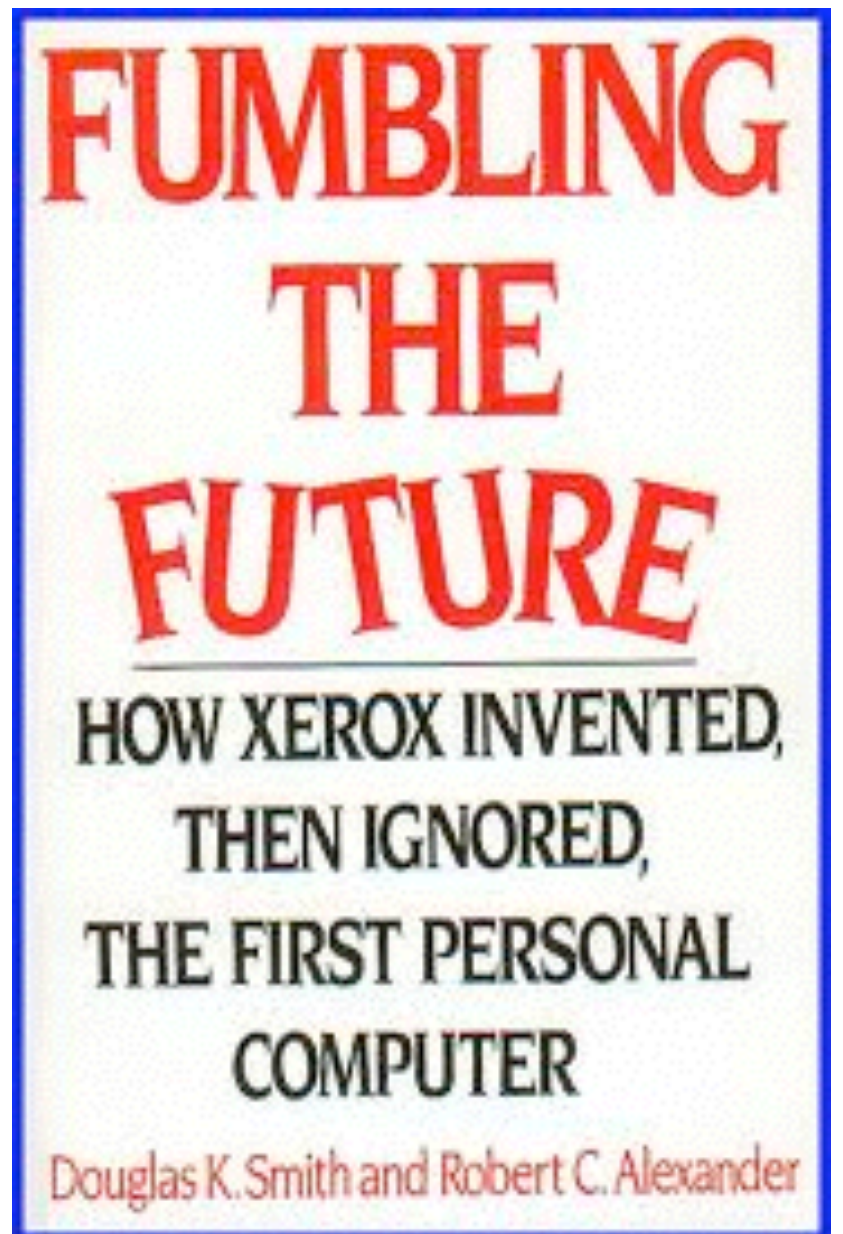
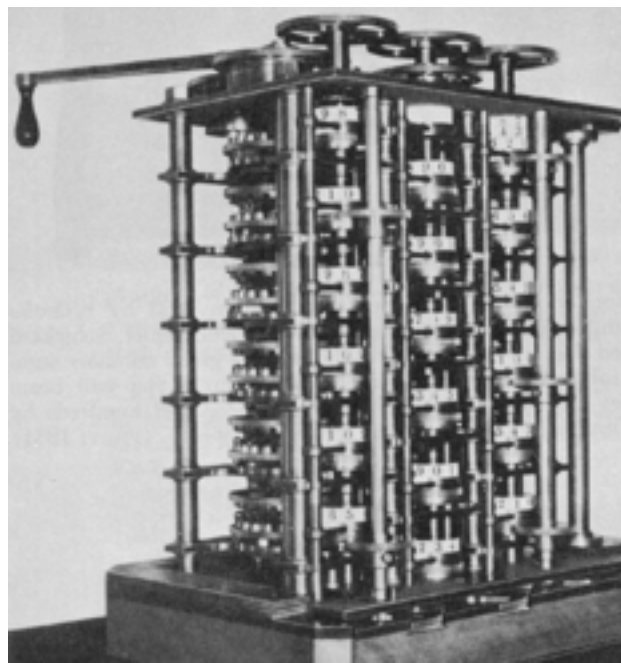




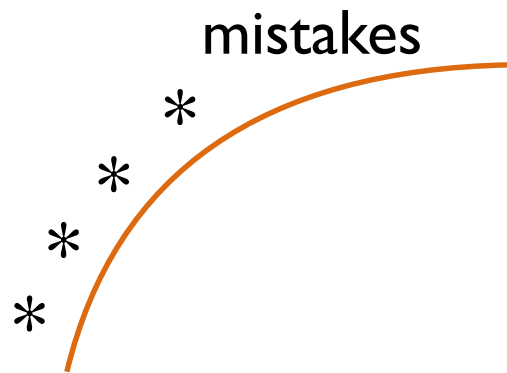


# leaving it all to the horse

coming up 4/7:  
computer  
revolution



"Westward the course of empire ..."



# techno-superiority



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

*Compare:* "The spiritual and cultural reservations that the oriental peoples may have toward our technology will avail them not at all."



determined mistakes

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

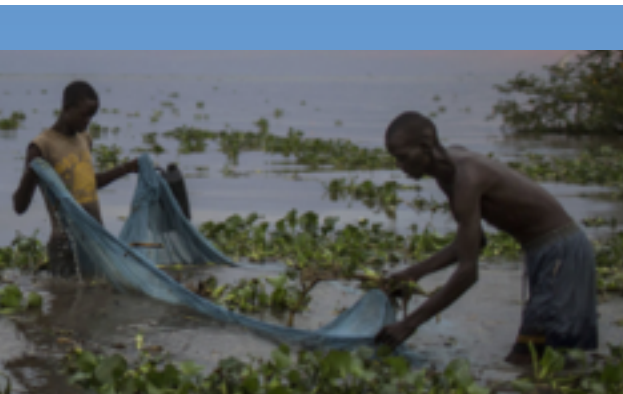
# linear thinking

AFRICA

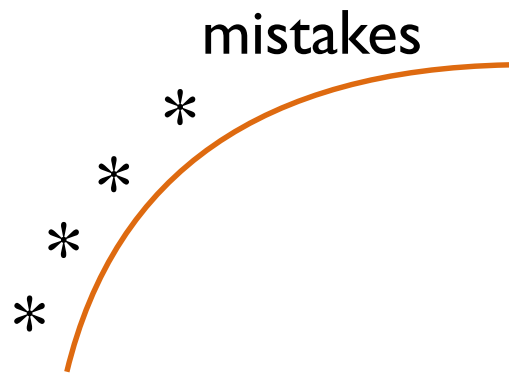
## unintended consequences

### *Meant to Keep Malaria Out, Mosquito Nets Are Used to Haul Fish In*

By JEFFREY GETTLEMAN JAN. 24, 2015



## moral hazard



# in conclusion

## **how to think about determinism**

what happened?

what was involved?

what did (or did not) come before?

what did (or did not) follow?

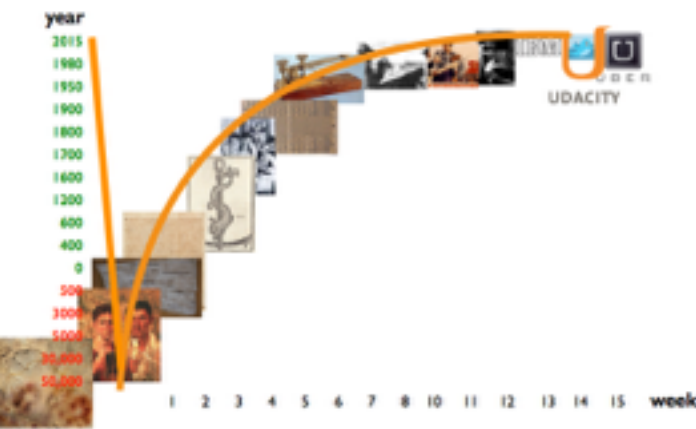
what did (or did not) contribute?

what happened elsewhere?

what's likely to be underestimated?

what was necessary, what sufficient?





# coming up

## 29 Jan: First Technologies: Writing

### *Required Readings*

Marshack, Alexander. 1999. "The Art and Symbols of Ice-Age Man, " pp. 5-14 in David Crowley (ed.) *Communication in History: Technology, Culture, Society*. Allyn & Bacon.

Source: Course reader

Gnanadesikan, Amalia E. 2009. *The Writing Revolution: Cuneiform to the Internet*. Hoboken: Wiley-Blackwell.

Read: Chs 1, 2, 4, 12.

Source: ebrary [[hyperlink](#) ↗ ]