

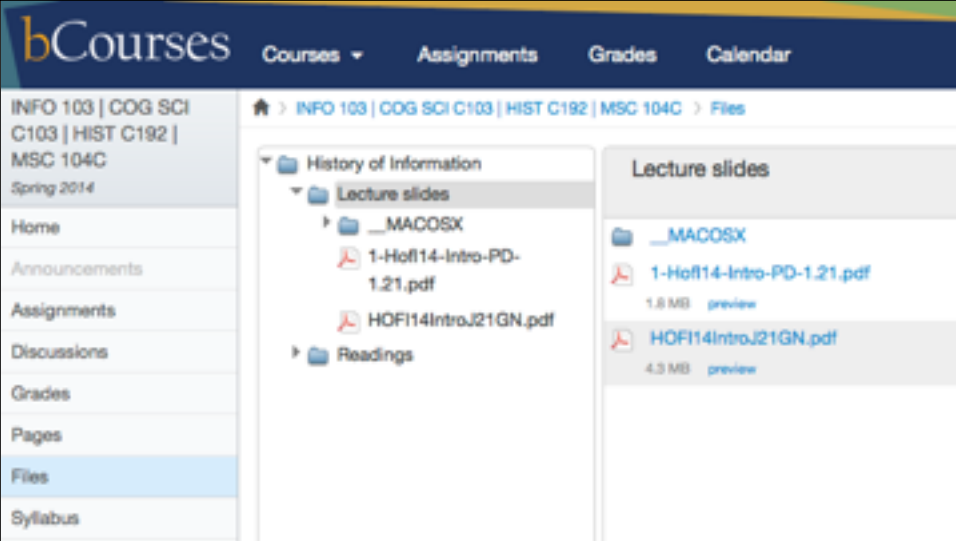
the "age of information"

& the information revolution

history of information

January 23, 2014





administrative matters

wait list

sign up

check with departments

wait/drop

class website

<https://ucberkeley.instructure.com/courses/1179322/assignments/syllabus>

class slides

<https://ucberkeley.instructure.com/courses/1179322/files#History%20of%20Information>

class reader

Copy Central, 2576 Bancroft Way



aob



Exercise for 1/23

Pick one of the following and write a (very) brief story or anecdote in which it serves as an "information technology," perhaps in conjunction with other things. Try to make your stories ingenious without being completely implausible. Bring your answer to class for discussion (but no need to hand them in).

- a necktie
- a blanket
- a rubber duckie
- a can of beans
- a lemon

"Extra credit" if you manage to use two of these in your story.

overview

the “age of information”

when was that?

what’s in an age?

getting from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

Everything is now on the
The age of information
I grew up, never knowing
because I be a cocaine
people surrounding me and
the only time I call a
It's in the mirror I'm
looking like I'm a man
cannabis residue was on
among computers, profus
if you have the answers give it to me
it's like I'm married,
tv is ran by money How
the truth is near me, I'm hearing it and I can feel in it
all we dumb it down for technology and the cost of living
I just forget it and continually smoking heavily
thinking about the melody
thinking of what's ahead of me
we come further than ever to live this space
somebody's got the weapons and is controlling the human race
it's the age of information
everything's on the internet now
my desktop is made to sedate me
thinking ecologically on my laptop for hours
like I'm in college for hours
asking Google about things that I should learn about
can't even get lost on the navi inside the phone overtake me
at the cost of never walking
they took away places where it's only the force
talking at peace, I've got my ipod slapping this beat
I'm on a mission to find peace in a position
the cost of living is taxes and jail time
time to find you passing, I'm asking the older people
how you make it to your

age of information



age of information

the “age of information”

what’s in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?



when was that?

IBM Reports

Fortune July 1977

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

ergenerational revolution

why history matters

technology drive history?

Information: there’s growing agreement that it’s the name of the age we live in.

Human history has long been described in terms of Ages whose names reflect the stages of development through which mankind has passed: the Stone Age, the Bronze Age, the Iron Age and so on—down to the Industrial Age, which established the foundations of our modern society.

Today, there is growing agreement that we have entered a new era—a post-industrial stage of development in which the ability to put information to use has become critical, not only to the essential production of goods, but to efforts to provide a better life for the individual, as well.

This new era is being referred to with increasing frequency as the Information Age.

Information in the Information Age

Changes in our perception of information itself—its nature as well as its scope—have accompanied this profound shift of emphasis in our society.

Much has been written about the so-called “information explosion.” It has been pointed out, for example, that the number of technical journals published throughout the world today exceeds 100,000, and that the total body of technical information is now doubling every ten years.

At the same time as the volume of information has been increasing dramatically, our understanding of the meaning of the term information itself has also broadened—to encompass a wide variety of timely data relating to “how things really are” across the whole spectrum of human activity.

A heartbeat, for example, can be extremely meaningful information when recorded and analyzed on sophisticated electrocardiogram equipment. So can electrical impulses reflecting the load level in a power network, or numeric digits representing the availability of a seat for you on an airplane—when processed by a modern computer.

These and a wide range of similar types of data are clearly recognized today as information, the kind of information on which we increasingly de-

pend for the growth and health of our economy, the smooth functioning of our institutions—and, even more important, for the quality of our individual lives.

Information—an inexhaustible resource

Information is one of the few resources not in danger of exhaustion on this shrinking planet. It is unique because the supply is limitless, because it actually becomes more valuable with use and because—when properly managed and applied—it can greatly enhance our use of all our other resources, natural, human and economic.

One reason, of course, that information has proved to be such a dynamic resource is the fact that there exists today a remarkable technological capacity for dealing with it rapidly and effectively.

Through a vast array of electronic tools and techniques, mankind is able to accumulate, organize, store, interpret, retrieve and transmit information on a worldwide scale, in a volume, at a speed, and with an accuracy that would have been impossible barely two decades ago.

It is also a technology that continues to grow and that has proved to be amazingly efficient in economic terms. As advance has followed advance, the cost of processing information has steadily declined. Since the 1950s, the cost of performing 100,000 calculations on an IBM computer has fallen from \$1.26 to less than one cent—and the downward trend continues.

Putting information to work for people

IBM makes many different products—from computers to copiers—but clearly, the essence of our business is information.

As a company, we are committed to exploring the limits of technology to find better, more imaginative and more productive ways to help put the benefits of this uniquely valuable resource to work for people.

IBM



earlier yet

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

ergenerational revolution



anniversaries

“[New media] does not centralize but decentralize ... In the new ...

Age of Information.”

or is information

the “age of information”

when was that?

what’s in an age?

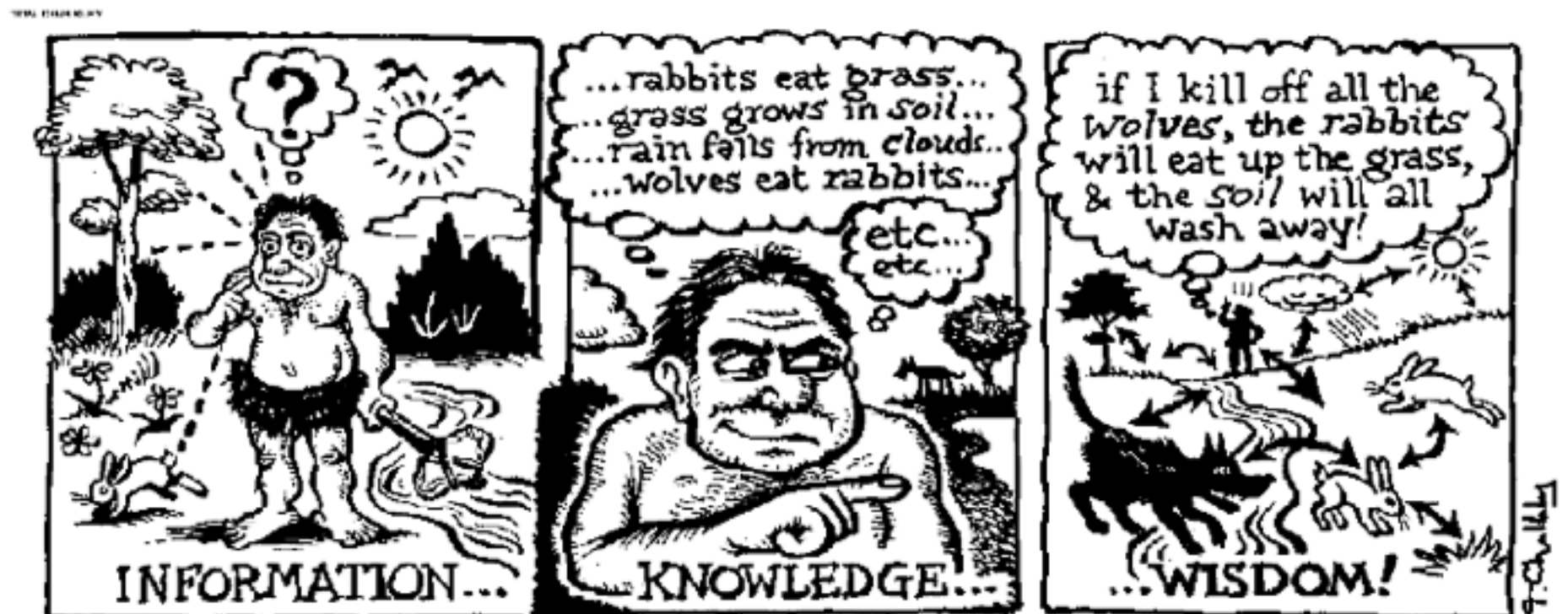
from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?



growing agreement?

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?



there's growing

self-conscious age of information

"In the long run, history is the story of information becoming aware of itself."

-- James Gleick,
The Information, 2011

the "age of information"

when was that?

what's in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

over to you

1. when did people become aware that they lived in an “age of information”?

2. what were the most important technological innovations of the time and how did they affect this awareness?

the age of information

when was that?

what's in an age

getting from one to another

revolution

intergenerational revolution

why history matters

does technology drive history?



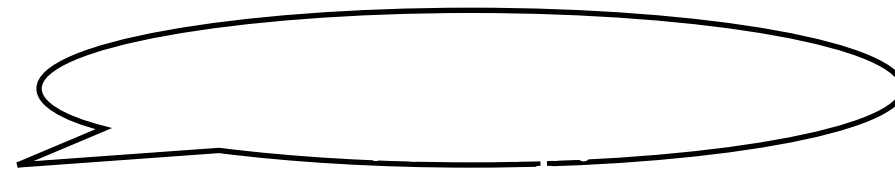
Vicesimus Knox

1752–1821

another opinion

"But though books are easily procured, yet, **even in this age of information**, there are thousands in the lower classes that cannot read. Besides, it is a well-known truth, that the same precepts inculcated by a living instructor, adorned by a proper oratory, enforced by a serious and authoritative manner, produce a powerful effect, not to be experienced in solitary retirement."

-- Vicesimus Knox,
Essays Moral and Literary, 1778



quiet times?

the age of
information

when was that?

what's in an age?



2013

1980

1950

1900

1800

1700

1600

1200

600

400

0

500

3000

5000

everything's now
on the internet ...



what was going on?

the emergence of the public sphere

newspapers, public opinion [coming up, Feb 18]

advertising, time management, IP

limited copyright [coming up, March 11]

organization of knowledge

Chambers, Diderot, Smellie [coming up, Feb 27]

revolution [coming up, today]

the age of
information

when was that?

what's in an age?

getting from one age
to another

revolution

intergenerational
revolution

why history matters

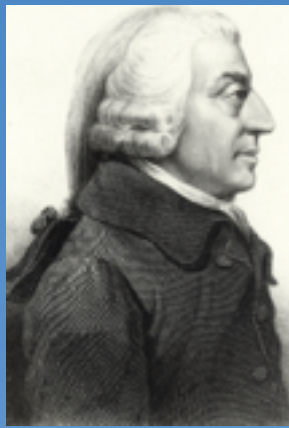
does technology
drive history?

"Human history has long been described in terms of ages ...The Stone Age, the Bronze Age, the Iron Age, and so on"

**IBM ad,
Fortune 1977**

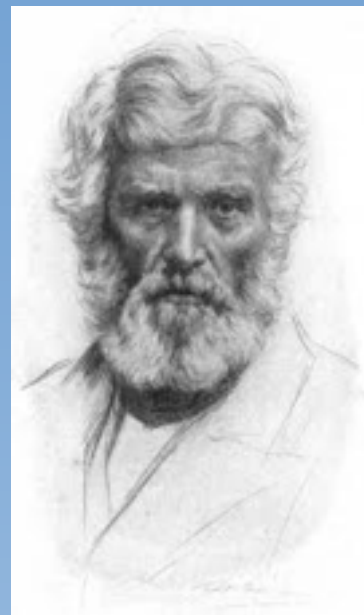
what's in an age?

ages past



Adam Smith

1723–1790



Thomas Carlyle

1795–1881

what's in an age?

ages past

hunter-gatherer

husbandry

manufacturing

commerce

A. Smith, 1776

"accelerating pace of change"?

first wave

agrarian revolution

second wave

industrial revolution

third wave

information revolution

Alvin Toffler,

— *The Third Wave*, 1980

overview

the “age of information”

when was that?

what’s in an age?

getting from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

new needs?

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

intergenerational revolution

"[I]n order to satisfy the new needs for information
and education, more books,
...and soon newspapers were required."

Lucien Febvre & Henri-Jean Martin

The Coming of the Book, 1984





evolutionary needs?

the age of information

when was that?

what's in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive
history?

"The need for readily available information, which had been steadily rising, was accelerated by the advent of Christianity ..."

"The need to find information more rapidly than is possible in a papyrus-roll-form book initiated the development of the Greco-Roman codex in the second century ..."

-- Frederick Kilgour,
The Evolution of the Book, 1998

evolutionary response?

the age of information

when was that?

what's in an age?

from one age to another

"Printed books evolved into
better-designed packages of information."

-- Paul Grendel,
*Cambridge History of
Renaissance Philosophy* 1988





cause or effect?

"glittering proof that a new information age was dawning in Europe, fuelled by the power of the printed word."

--Stephen Fry,
The Machine That Made Us. BBC 2008

[veoh.com]

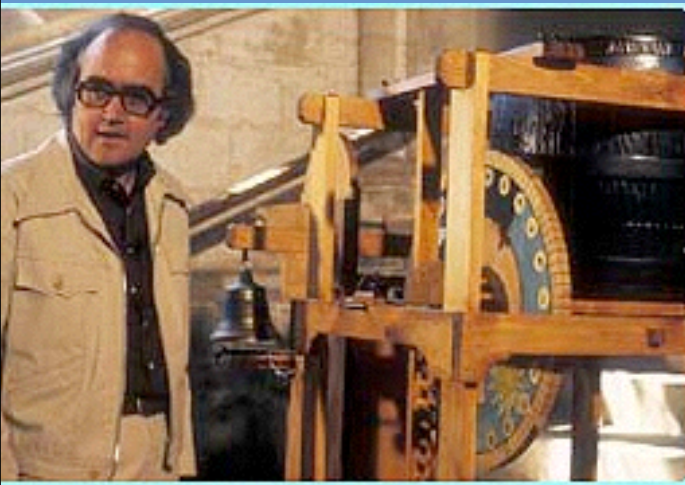
[youtube]

coming up:

"Print revolution"

11 Feb

dawn to revolution



"The day the universe changed"

James Burke, *Printing Transforms Knowledge*
BBC 1986 [UC Media Center]

overview

the “age of information”

when was that?

what’s in an age?

getting from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

revolution?

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

**what does it
look like?**





what does it look like?



John Evelyn
1620–1706

an English perspective:

- going round in circles: 1640-1660

gaining direction? "Glorious Revolution" (1688)

"The Popists in offices lay down their
Commissions and flie: it lookes like a
Revolution."
-- John Evelyn, *Diary*, 1688



William Wordsworth
1770–1850

an Anglo-French perspective:

"a Pope/is summoned in, to crown an emperor ...
the dog/Returning to his vomit ..."

--William Wordsworth, *Prelude*, 1805
2-HofI14-Age-of-Info-PD- 28



Marshall McLuhan
1911–1980

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

still circling?

new media “creates ... depth of involvement ...
and human association that our preceding
mechanical technology has destroyed.

“... the causes of things begin to emerge to
awareness again ... We return to the inclusive
form ...”

McLuhan, *Understanding Media*, 1964

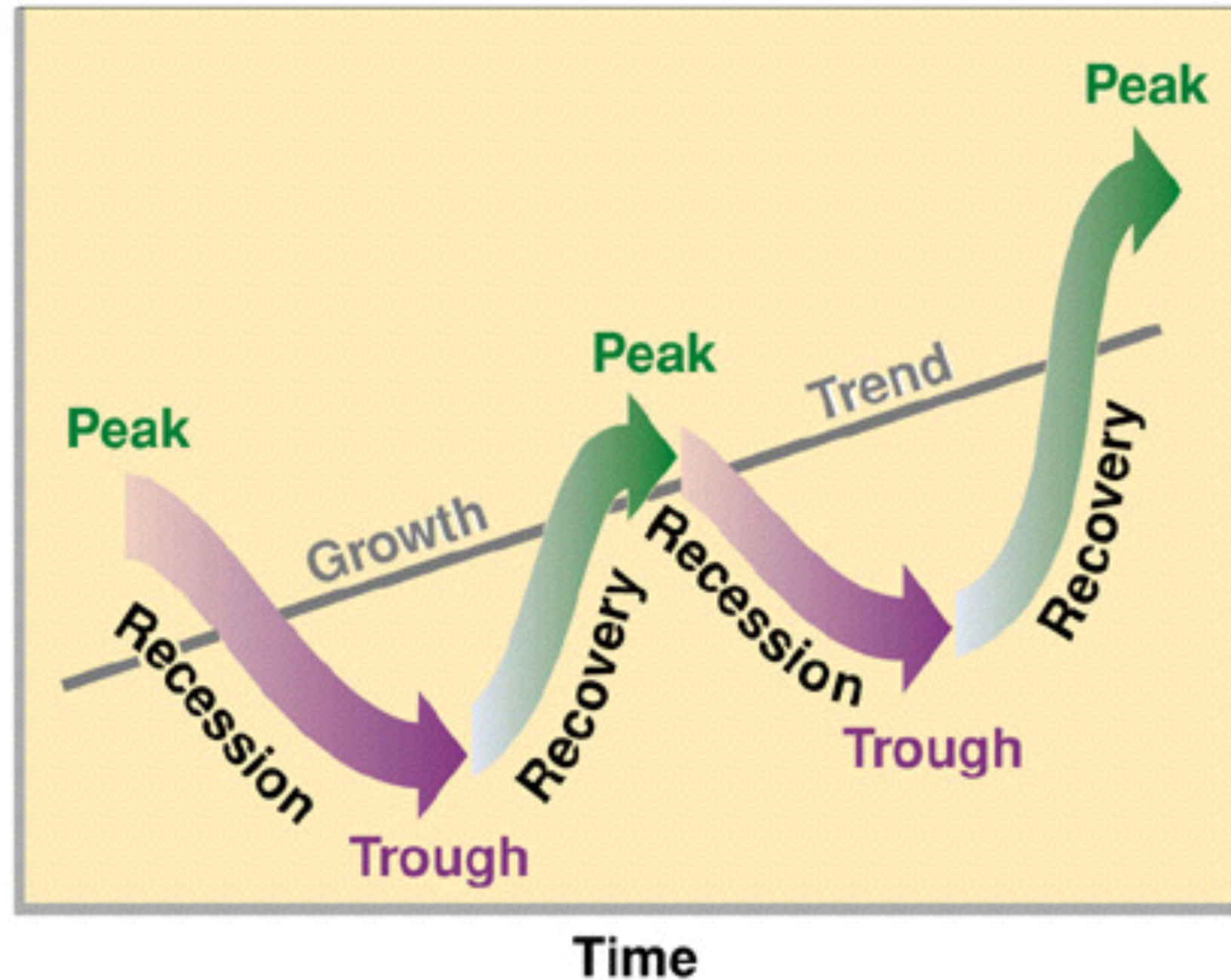
Recession's True Cost Is Still Being Tallied

JAN. 21, 2014

still?

THE
MASTER
SWITCH
THE RISE AND FALL OF INFORMATION EMPIRES
TIM WU

Level of real output



what does it look like?

the “age of information”

when was that?

what’s in an age?

from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?

all much the same?

English

American

French

Haitian

Russian

Iranian

Tunisian/Egyptian/Syrian ...

—Jacques Ellul,

Autopsie de la Revolution, 1969

permanent revolution?

PRÉFACE

*R*évoltes, révolutions, émeutes, rébellions, émotions, guerres civiles, coups d'État, l'histoire entière en est tissée¹. La vie de l'homme en est faite. Non point accident mais constante, non

1. L'histoire en est tissée... Prenons quelques exemples : le XVII^e siècle : 1601 à 1610, « le temps des troubles » série de révoltes en Russie; 1610, révolte des Sikhs; 1620-1630, révolte chinoise contre les Mings; 1631, soulèvement de Dijon et d'Aix-en-Provence; 1635, soulèvement de Bordeaux; 1636, révolte des Croquants; 1637, révolte d'Awa Kousa au Japon; 1639, révolte des Nu-pieds; 1640 à 1644, révoltes contre les Mings, aboutissant à la chute de la dynastie; 1640, révolte de la Catalogne contre l'Espagne qui ne s'achève qu'en 1652; et la même année, 1640, débute aussi la révolution du Portugal, qui restera, latente ou explosive, permanente jusqu'en 1668; 1641, année de troubles très généralisés, révoltes paysannes en Irlande, Suisse, Allemagne, Russie; 1643, révolte du Rouergue; 1645, révolte de Montpellier; 1647, révolte de Masaniello à Naples, contre le vice-roi espagnol, pendant un an; 1648 est également une année forte pour les révolutions : révolution d'Angleterre commencée en 1640 mais qui se développe de 1648 à 1653 tout particulièrement, et dont on a dit qu'elle était peut-être « la première grande révolution bourgeoise des temps modernes »; la Fronde en France, de 1648 à 1652; l'insurrection d'Ukraine, de 1648 à 1654; les émeutes populaires en Russie, dans cette même année, à Moscou, Koslov, Tomsk, etc.; la révolte hindouiste des Mahrattes contre les envahisseurs mongols, toujours en 1648; en 1649, la révolte de Moscou qui reprend; 1650, émeute de Novgorod et coup d'État de Guillaume de Hollande; 1653, guerre paysanne de Suisse; 1662, révolte du Boulonnais, révolte de Moscou pour un problème monétaire; 1664-1670, la grande rébellion d'Audijos; 1670-1671, la grande révolte de Stenka Razin et le soulèvement paysan de Bohême;

10

AUTOPSIE DE LA RÉVOLUTION

point trouble mais mouvement apporté dans le cours paresseux de l'histoire.

Il n'y a pas un exceptionnel de la révolution opposé à un normal ou à une règle de la vie des peuples, des pouvoirs, des civilisations. Ne nous contentons pas des schémas historiques qui nous parlent de 1649, de 1785, de 1917 : alors, scrutant les événements d'un peu plus près, voici que nous constatons dans les faits cette permanence de la révolution parmi les hommes. Il est vain de chercher une division entre des périodes calmes et des périodes troublées. La révolution est moins la locomotive que l'un des éléments de la chaîne invisible du tissu des civilisations.

Mais nous nous trouvons immédiatement arrêté par un souci formel de définition. Que disons-nous au travers de ce mot révolution? Qu'entendra l'autre dans ces quatre syllabes? « Le devoir de tout chrétien est d'être révolutionnaire », proclama Camilo

1673 à 1681, le soulèvement considérable du nord-est de la Chine; 1675, nouvelle année d'abondance : révoltes dites du papier timbré en Bretagne et à Bordeaux, accroissement des rébellions sikhs et mahrattes, et aussitôt après la révolte religieuse des Camisards; 1679, la révolution d'Irlande.

Prenons une autre période : de 1770 à 1850. Là encore nous constatons émeutes, rébellions, révoltes, révolutions dans le monde entier. 1768, révolution démocratique de Genève; 1770 à 1783, la révolution américaine, à la suite de sa guerre contre la Grande-Bretagne; 1772, révolution royale en Suède; 1780 à 1783, révoltes multiples en Angleterre et en Irlande, grande révolte des Indiens du Pérou; 1781, insurrection de Nouvelle-Grenade, révolution à Fribourg, et de nouveau à Genève en 1782; 1783 à 1787, révolution aux Provinces-Unies avec diverses orientations; 1787-1790, révolution des Pays-Bas autrichiens; 1788-1794, révolte de Guyane, révolution polonaise; 1789, début de la révolution française, démocratisation du régime en Suède; 1791, révolution polonaise; 1792, reprise de la révolution belge et révolution rhénane, révolte généralisée dans les Antilles; 1794, émeutes en Irlande; 1795, révolution en Hollande et à Genève, émeutes à Londres, Birmingham, etc., à Constantinople, à Smyrne; 1796, révolution dans les États italiens; 1797, mutinerie des flottes anglaises; 1798, révolution en Suisse et en Irlande; 1799, révolte des îles Ioniennes et de Malte; 1810, révolution



which does it look like?

"The global communication revolution can be the first revolution in history that has no losers."

C. Michael Armstrong,
CEO, AT&T



overview

the “age of information”

when was that?

what’s in an age?

getting from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?



short duree?

digital natives

"Today's students think and process information fundamentally differently, and these differences...run much deeper than most educators would like to have it."

–Edith Ackermann,

"Anthropology of Digital Natives" 2008

The Children of Cyberspace: Old Fogies by Their 20s

By BRAD STONE

Published: January 9, 2010

newly new

"I've begun to think that my daughter's generation will also be utterly unlike those that preceded it. Researchers ... theorize that the ever-accelerating pace of technological change may be minting a series of mini-generation gaps. ... 'People two, three or four years apart are having completely different experiences with technology,' said Lee Rainie, director of the Pew Research Center's Internet and American Life Project.

'College students scratch their heads at what their high school siblings are doing, and they scratch their heads at their younger siblings. It has sped up generational differences.'"

move over M1

Generation M2:

Media in the Lives of 8 to 18-year olds.

"Five years ago, we reported that young people spent an average of nearly 6-1/2 hours (6:21) a day with media—and managed to pack more than 8-1/2 hours (8:33) worth of media content into that time by multitasking. At that point it seemed that young people's lives were filled to the bursting point with media. Today, however, those levels of use have been shattered."

<http://www.kff.org/entmedia/upload/8010.pdf>



permanent revolution?

the age of information

when was that?

what's in an age?

moving from one age to another

revolution

**intergenerational
revolution**

why history matters

do technology drive history?

children of the depression

baby boomers

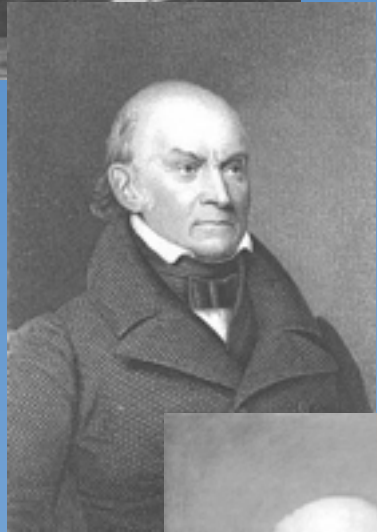
generation x

generation y

generation m¹

generation m²

... generation mⁿ



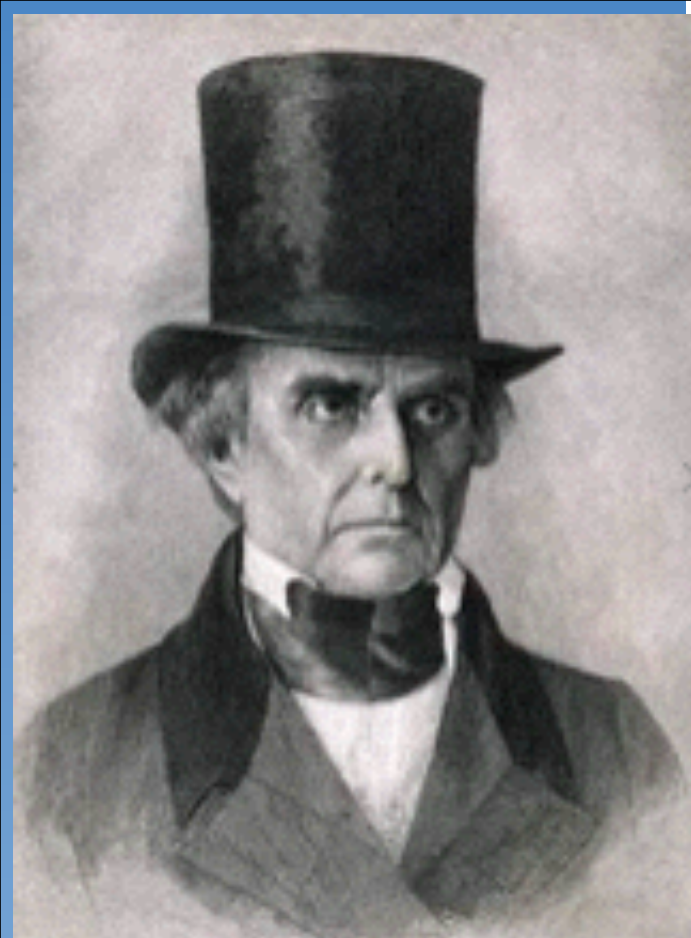
Henry Adams

1838–1918

looking back

"Only on looking back ... at his own figure in 1854, and pondering on the needs of the twentieth century, he wondered whether, on the whole, the boy of 1854 stood nearer to the thought of 1904, or to that of the year 1 ... in essentials, the American boy of 1854 stood nearer to the year 1 ... Before the boy was six years old he had seen four impossibilities made actual--the ocean-steamer, the railway, the electric telegraph, and the Daguerreotype."

--Henry Adams,
The Education of Henry Adams [1905]



Daniel Webster

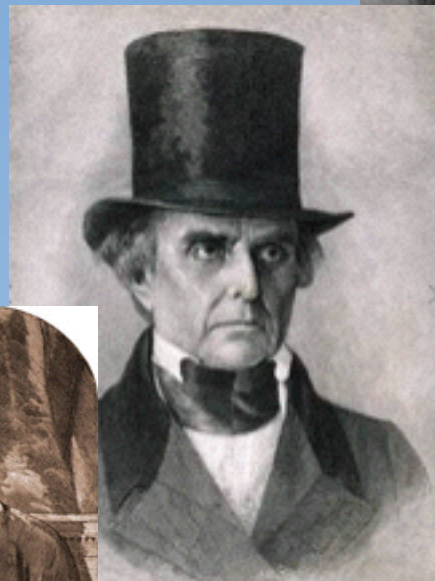
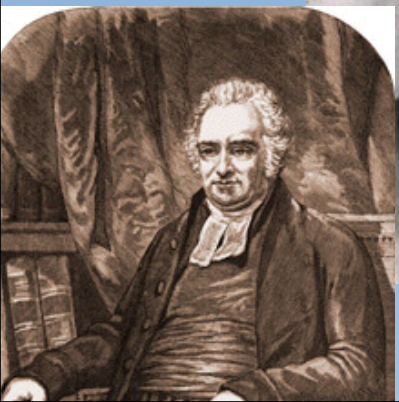
1782–1852

1854, or was it 1847?

"the age is remarkable for scientific research. ... The ancients saw nothing like it. The moderns have seen nothing like it **till the present generation**. We see the ocean navigated and the solid land traversed by steam power, and intelligence communicated by electricity. Truly this is a miraculous era."

—Daniel Webster, "Dedication of the Northern Railroad," 1847.

who's wrong?



overview

the “age of information”

when was that?

what’s in an age?

getting from one age to another

revolution

intergenerational revolution

why history matters

does technology drive history?



what's going on?

the “age of information”

when was that?

what’s in an age?

g from one age to another

revolution

intergenerational revolution

why history matters

technology drive history?

everything's now on the internet ...

we are dumbing down for technology ...

my desktop is made to sedate me ...

the age of information is hell ...

information has hurt the race ...

the human race has not progressed as much
as we should be ...

How come the human race isn't

progressing as fast as technology?

Yea we're going to be staying on the moon

But there's still going to be racists

...are we really winning



looking back

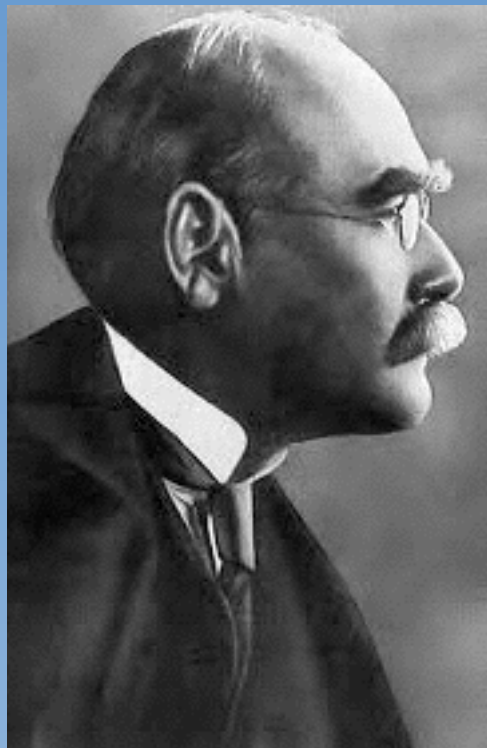
the same? different? better? worse?
how would we know?

"What should they know of England
Who only England know?"

-- Rudyard Kipling

"The English Flag," 1899

what should we know of our "age"
who . . .?



Rudyard Kipling
1865–1936



dangerous pastime?

"Mao urged the emulation of ... an emperor [Qin Shi Huang] who had advocated eliminating anyone who used history to criticise the present. [Huang] 'buried 460 scholars but we buried 46,000.' "

James C. Scott, "Tyranny of the Ladle," 2012

hence

*talk of revolution, transformation, rupture, coupure,
2.0*



and a challenging pastime?

like learning cricket?

"The past is a foreign country.
They do things differently there."

--L.P. Hartley,
The Go-Between, 1953



Plato
Trithemius
Sprat
Addison
Steele
Knox
Johnson
Harrison
Morse
Babbage
Henry
Bell
Marshall
Bush

central themes

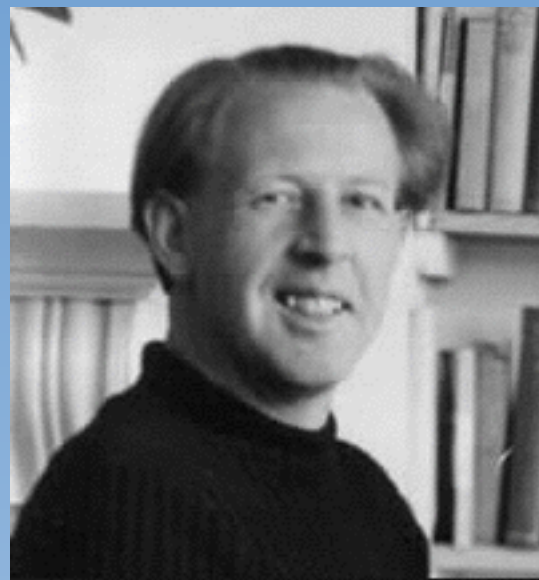
beyond presentism

"The real, central theme of history is
not what happened, but what people
felt about it when it was happening"

-- George M Young,
Victorian England: Portrait of an Age, 1960



"Wired's patron
saint"



Stanford, California
& Cambridge, England
1973

coming up

1/28/2014: Technological Determinism **reading**

"McLuhan, Marshall. 1964. *Understanding Media*. New York: McGraw-Hill.

Read: "Preface to Third Printing" pp. v-x; & "Introduction," & "The Medium is the Message" pp. 3-21. [pages x-x in reader]

Source: Course reader

Williams, Raymond. 1974. *Television and Cultural Form*. New York: Schocken Books.

Read: Chapter 1, introduction and sections a & b, pp. 9-19; & Chapter 5, section c, pp. 126-128." [pages x-x in reader]

Source: Course reader

assignment

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