



today's question

The American Instructor and *The Young Man's Companion*

suggest that by controlling the technology of the day that deals with time ("Chronology"), space ("Land Measure"), and money ("Book-keeping") a "Young Man" [sic] will form "a mind for business" and as a result be able to take control of his life. Yet since the 18th century, others have suggested that such technologies are as likely to lead to our lives being controlled. Using an example from Fisher or Mather and its present day equivalent, argue whether, then and now, such technologies tend to give us freedom or to submit us to social or technological control. Find support for your claim about the modern device.



History of information

Tuesday
Feb 28, 2016



Advice to a young Tradesman, written by an old One.
To my Friend A. B.
As you have desired it of me, I write the following Hints, which have been of Service to me, and may, if observed, be so to you.
REMEMBER that Time is Money. He that can earn Ten Shillings a Day by his Labour, and goes abroad, or sits idle one Half of that Day, tho' he spends but Six-pence during his Diversion or Idleness, ought not to reckon that the only Expence; he has really spent, or rather thrown away Five Shillings besides.

what day?

All a Tiwitter?

tuesday: *Originally cognate with or formed similarly to Old Frisian tīesdei , ... the genitive of the Germanic base of the name of (the god) Tiw*

mardi

dienstag

terça-feira

मंगलवार

星期二

火曜日

יום שלישי

(يوم) الثلاثاء

feverish dates

28 February

pure and simple?

Anglo-Norman feverer,

feverrer, feveryer,

feverzere, feverell,

februer, februarye,

februarie, etc., ... means

of purification,

expiatory offerings, of

uncertain origin

février [8 ventôse]

feverio

Ren-Yin 3 [China]

Phalguna 8 [Hindu]

Jumada Al-Akhira 1 [Islam]

Adar 2 [Jewish]

Esfand 10 [Persian]

happy 5 times a year?

4715 - Chinese

New Year: Jan 28 (rooster)

1395 - Persian

New Year: March 21

5777 - Jewish

New Year: September 21

1438 - Islamic

New Year: September 22

and that 1-1/2 hour class ?

History of
information
Tuesday
Feb 23, 2016
9:30 - 11

"Formerly [i.e. before the 14th century] the hours were commonly reckoned as each equal to one-twelfth of the natural day or night, whatever its length (called planetary, temporary, or unequal hours); the equal hours were sometimes distinguished as equinoctial, being each equal to a temporary hour at the equinoxes, sidereal hour, solar hour, 24th part of a sidereal, or solar, day."

OED

Time
Space
Money

time, space, and money

year

2017

1980

1950

1900

1800

1700

1600

1200

600

400

0

500

3000

5000

30,000

50,000

1

2

3

4

5

6

7

IBM



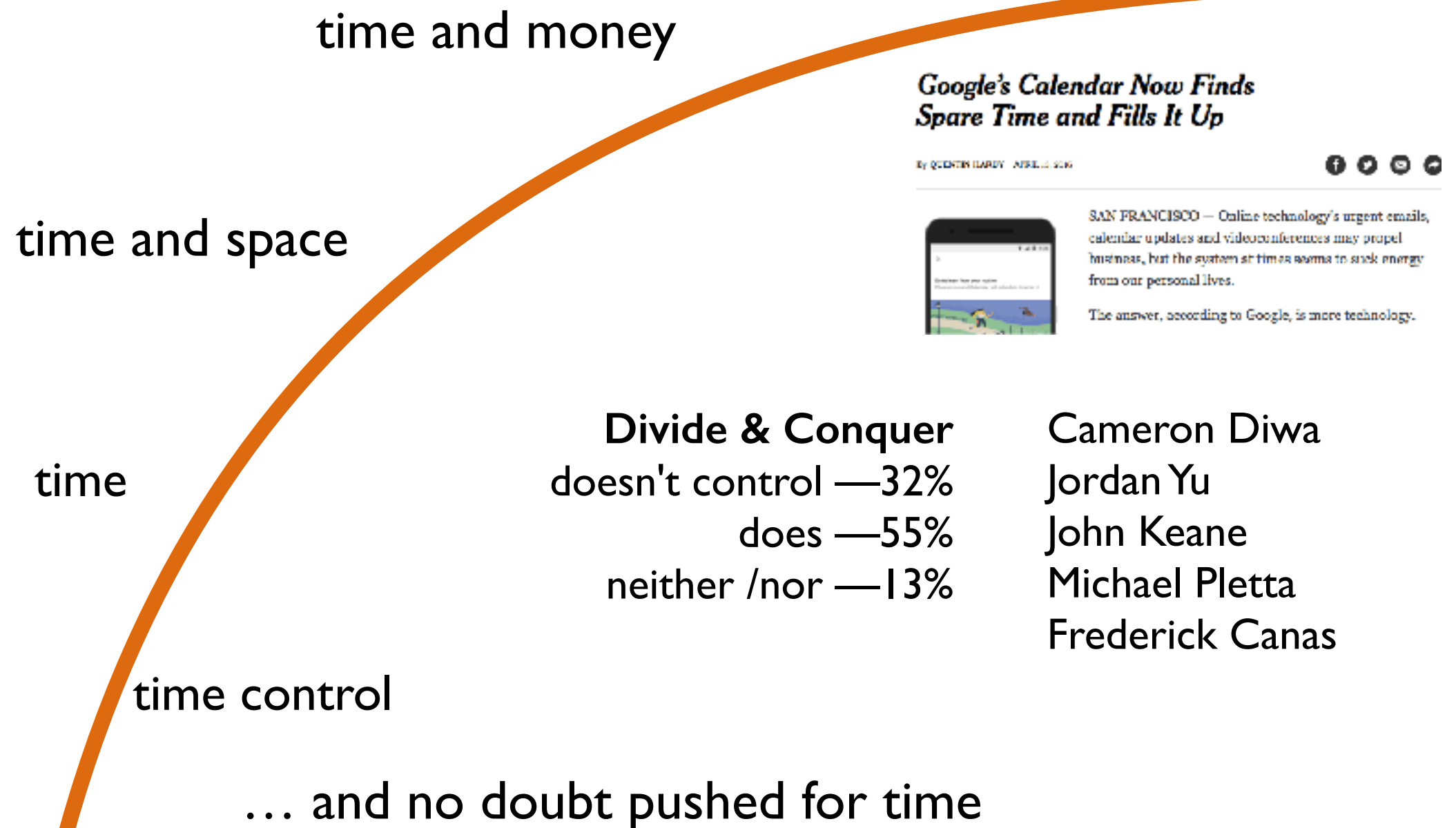
fake news

Apple WATCH

Time Space Money

"I wasted time, and now doth time waste me;
For now hath time made me his numbering clock:
My thoughts are minutes; and with sighs they jar
Their watches unto mine eyes"

— Richard II



THE
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 COMPANION,**
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 Plain and full Directions for Spelling, and Reading
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 By ISAIAH THOMAS and DAVID CARLISLE,
 for said THOMAS, in WORCESTER, Massachusetts; said THOMAS,
 and ANDREWS, D. WEST and E. LARKIN, JUN. in BOSTON.
 MDCCLXXV.

James A. The American Teacher
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James A. OR, The American Teacher
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successive adaptation

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 (24 editions by 1775)

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 (or Mrs Slack?)

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THE
Young Man's
COMPANION,
Or a very useful Manual for
YOUTH.
CONTAINING
Plain and full Directions for Spelling, and Reading
English and Latine, and the Englishing the La-
tin Bible without a Teacher; with easie Rules
for Writing and Arithmetick. Likewise the
Plotting, and Measuring of Land, Globes, Stee-
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Glas, &c.
Of Surveying, Astronomy, Dialling, and Glazing;
also some secrets in Navigation, Geography,
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land; and a Brief History of the British

"Punishment ...
for the man who
sells cloth
dyed in England
from cloth dyed
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left free to
profit from
mere textual
corruptions ...
under the label
of good
authors"

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Spelling, Reading, Writing, and Arithmetick,
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both in Prose and Verse. How to write LETTERS on Business
or Friendship. Forms of Deeds, Bonds, Bills of Sale, Powers
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ducts, Counties and Market Towns in England and Wales, &c.
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ters Joiners, Sawyers, Bricklayers, Plasterers, Plumbers, Masons, Glas-
siers, and Painters Work. How to undertake each Work. With
the Description of Gunter's Line, and Coggshall's Sliding Rule.
Likewise, the PRACTICAL GAUGE, made Easy;
the Art of Dialling, and how to erect and fix any Dial; with in-
structions for Dying, Colouring, and making Colours; and some
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With Instructions for Marking on Linen: How to
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And a COMPENDIUM of the
SCIENCES of GEOGRAPHY and ASTRONOMY;
CONTAINING,
A brief Description of the different Parts of the Earth, and
a Survey of the Celestial Bodies.
Also, several very useful TABLES
By GEORGE FISHER, Accomptant.
PRINTED IN WALPOLE, NEWHAMPSHIRE,
By ISAIAH THOMAS and DAVID CARLISLE,
For Isid THOMAS, in WORCESTER, Massachusetts; Isid THOMAS,
and ANDREW, D. WEST and E. LARKIN, Jun. in BOSTON.
MDCCLXXV.


successive adaptation

William Mather, *Young Man's Companion*
(24 editions by 1775)

George Fisher *The Instructor*
(or Mrs Slack?)

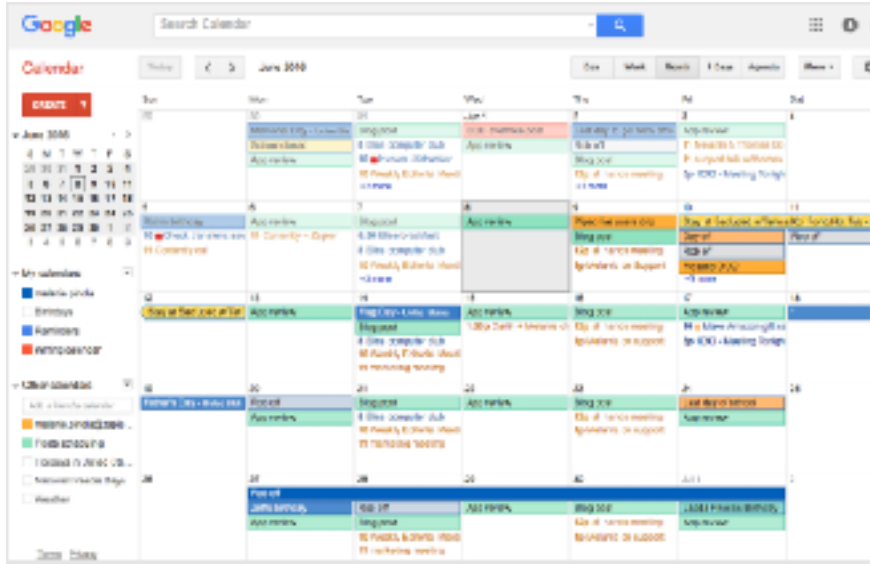
The American Instructor, 9th edition, 1748
(16 editions by 1800)

James A The American Instructor
INSTRUCTOR
OR,
James A
Young Man's Best Companion.
CONTAINING,
Spelling, Reading, Writing, and Arithmetick
in an easie Way than any yet published; and how to qu-
lify any Person for Business, without the Help of a Master
Instructions to write Variety of Hands, with Copi-
both in Prose and Verse. How to write Letters on B-
siness or Friendship. Forms of Indentures, Bonds, Bi-
of Receipts, Wills, Leases, Releases, &c.
Also Merchants Accounts, and a short and easie M-
hod of Shop and Book-keeping; with a Description of the sever
American Colonies.
Together with the Carpenter's Plain and Exact Rule: Shew-
ing how to measure Carpenters, Joiners, Sawyers, Bricklayers, Pl-
sters, Plumbers, Masons, Glasers, and Painters Work. How
undertake each Work, and at what Price; the Rates of each Com-
modity, and the common Wages of Journeymen; with Gunter's Lin-
and Coggshall's Description of the Sliding-Rule.
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Plasters, and Medicines, necessary in all Families.
And also
Prudent Advice to young Tradesmen and Dealers.
The whole better adapted to these American Colonies, than
any other Book of the like Kind.
By GEORGE FISHER, Accomptant.
The Ninth Edition Revised and Corrected.
PHILADELPHIA: Printed by B. FRANKLIN at
D. Hall's, at the New-Printing-Office,

Young Man's Companion:
L12
Sarah Collingwood
Her Book
February 6: 1795

Sarah Collingwood
Wood Her Book
Sarah Collingwood Book
[Price Two Shillings and Six Pence.]

"Not only
published by
Franklin and Hall,
but ... largely
rewritten by
Franklin."

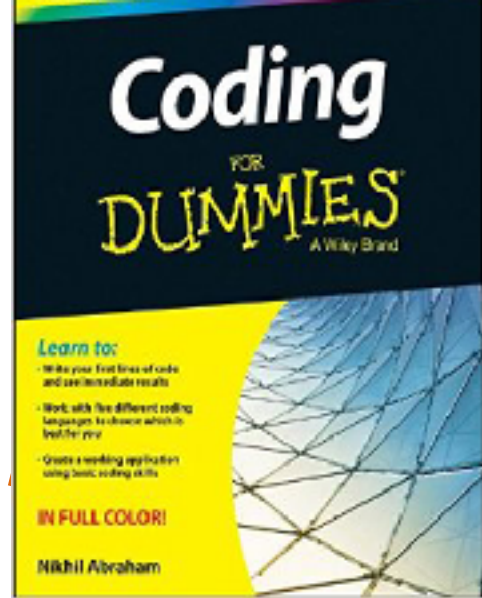
—Linglebach, "Franklin's
American Instructor" 1952



does not

Mather continues to explain how the year was further broken down and organized into months, weeks, days, hours, minutes, and seconds, thereby creating the calendar. This technology allowed people to more accurately calculate past events, since, before the calendar, “it would otherwise be impossible to assign the Distance between these and other Events” (257). It also allowed them to plan for future events, since it provided them with a framework for the amount time they still have until those future events happen.

The calendar has immensely aided our perception of time, and how we choose to organize it. Therefore, the calendar gives us the freedom to plan out our life as it comes. It does not control us, but rather, we are in control of our time by how we choose to use it. —Cameron Diwa



does not

... effectively "Coding for Dummies" ... While it may be true that any emerging technology may be used by a few to exert control over many, it does not stand to reason that the willful ignorance of such technologies does anything to improve the situation. She who prefers not to be hacked would do well to learn software security.

Similarly, he who did not wish to be cheated or to remain forever in debt was well advised to learn bookkeeping. The history of information technology overlaps almost entirely with the history of the communication of technology. Failure to remain fluent in the changing language, whether by negligence or by protest, results in not so much freedom as ignorant subjugation.

—Jordan Yu



does too

When compared to modern devices like television, computers, or smartphones, it is almost laughable to think that at one point, people suggested that 'technologies' for calculating things like "is this year a leap year?" and "What time will the moon come to the south?" on a certain date would lead to citizen's lives being controlled. However, I do think that as of more recently, the invasive nature of modern devices do in fact control our lives in one way or another. Maybe most alarming are the techniques of marketing companies use to process all of your phone's input to personally tailor selective advertisements that their algorithms say will be most effective on you. Any sort of artificial intelligence that analyzes one's behavior to exploit their actions, thoughts, and beliefs to make them purchase more goods seems foul and sinister, if not life-controlling. In addition, wearable technology that converts your every step, meal, location, and bodily function (like heart rate) can be thought of as somewhat life controlling, if not merely invasive. The fact that one's friend, parent, or boss could feasibly track the whereabouts one's smartphone or other sophisticated seems quite Orwellian to say the least, yet it is a reality that we live with today. —John Keane

Seven Surprises for New CEOs

by Michael E. Porter, Jay W. Lorsch, and Nitin Nohria

FROM THE OCTOBER 2004 ISSUE

does too

Bookkeeping in a general ledger is still a powerful tool used in accounting today. However, whereas the 18th-century book-keeping gave businessmen more control and thus freedom over their transactions, modern day bookkeeping software like Quickbooks or InDinero, with their advanced analytics, seem to dictate businesses decisions. With the introduction of shareholders, businesses have become slaves to their books (accounts). Book-keeping is no longer for the knowledge of the businessman, but for the persecution of the business man. Writers for the Harvard Business Review agree that modern day CEOs are surprised by the lack of control they have over their company.

— Michael Pletta



does 'n' doesn't

Even though many years ago “after Arithmetick, the Art of Book Keeping” was great profession[153] that is hardly the case anymore. It is now a job that does not require a college degree. With bookkeeping software, nowadays, like Quickbooks, the computer is doing all the math leaving us just inputting data and checking that the numbers inputted into it are correct ...

We have grown dependent on technology. It has made it easier to get people interested in fields that were once reserved for people of a certain status. At the same time, it has made us lose the notion of why something works the way it does because a computer does all of it for us.

— Frederick Canas

Time
Space
Money

"I wasted time, and now doth time waste me;
For now hath time made me his numbering clock:
My thoughts are minutes; and with sighs they jar
Their watches unto mine eyes"

— Richard II

time and money

Google's Calendar Now Finds Spare Time and Fills It Up

By QUENTIN HARRY / APRIL 11, 2016



SAN FRANCISCO — Online technology's urgent emails, calendar updates and videoconferences may propel business, but the system at times seems to suck energy from our personal lives.

The answer, according to Google, is more technology.

time and space

time

time control

... and no doubt pushed for time

putting the other "Rs" in their place

"The Scientific Revolution outshines everything since the rise of Christianity and reduces the Renaissance and Reformation to the rank of mere episodes, mere internal displacements within the system of medieval Christianity."

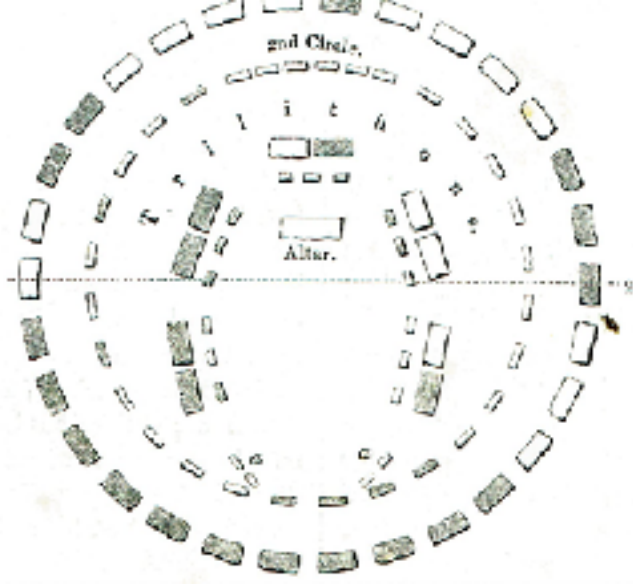
— Herbert Butterfield,
The Origins of Modern Science, 1300-1800, 1948

key machines

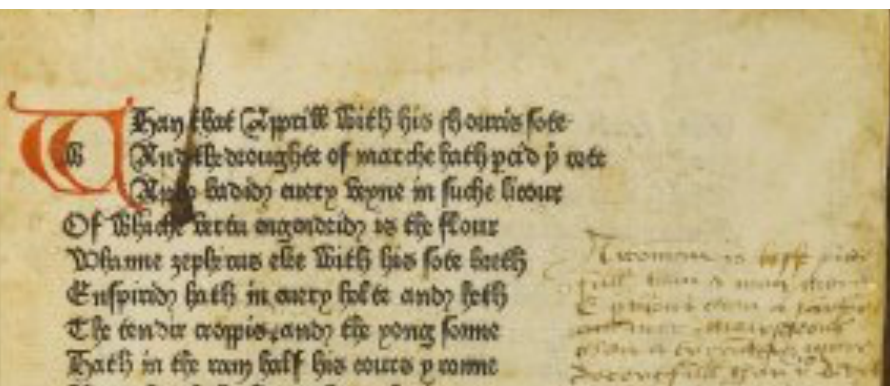
"The clock, not the steam engine, is the key machine of the modern industrial age ... even today no other machine is so ubiquitous."

—Lewis Mumford, *Technics & Civilization*, 1934





the long then



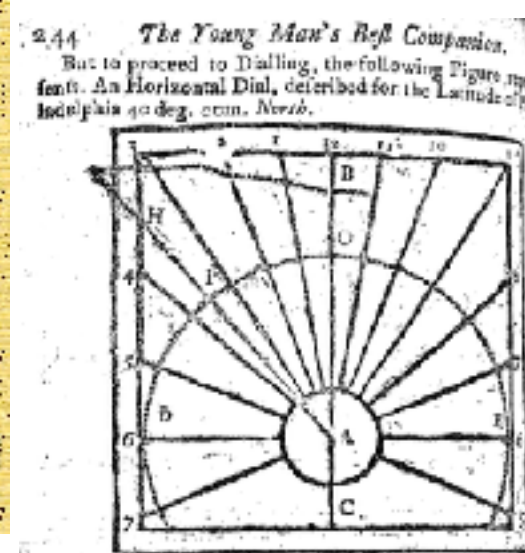
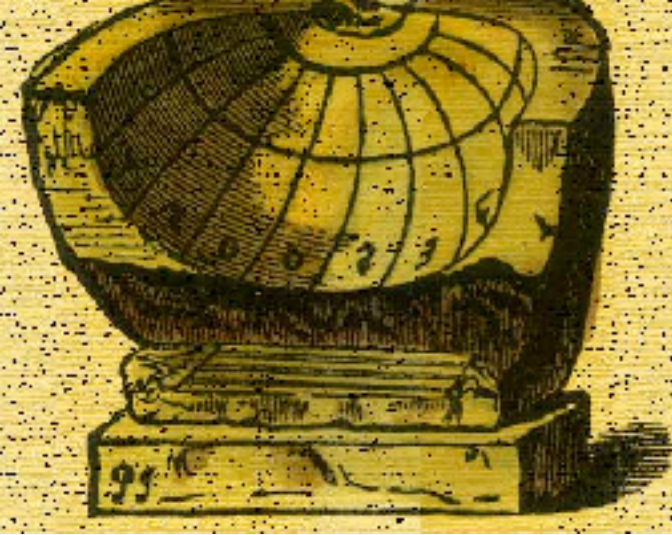
Whan that **Aprill** with his shoures soote
 The droghte of **March** hath **Perced** to the roote,
 And bathed every **veyne** in swich **licour**
 Of which **vertu engendred** is the **flour**;
 Whan Zephirus eek with his sweete breeth
Inspired hath in every holt and heeth
 The **tendre** croppes, and the yonge sonne
 Hath in the ram his halve **cours** yronne,
 And smale foweles maken **melodye**,
 That slepen al the nyght with open ye
 (so priketh hem **nature** in hir **corages**);
 Thanne longen folk to goon on **pilgrimages**...



"Most of what has
 been written about
 Stonehenge is nonsense"

c. 3100 bce

— R.J.C. Atkinson



clock time

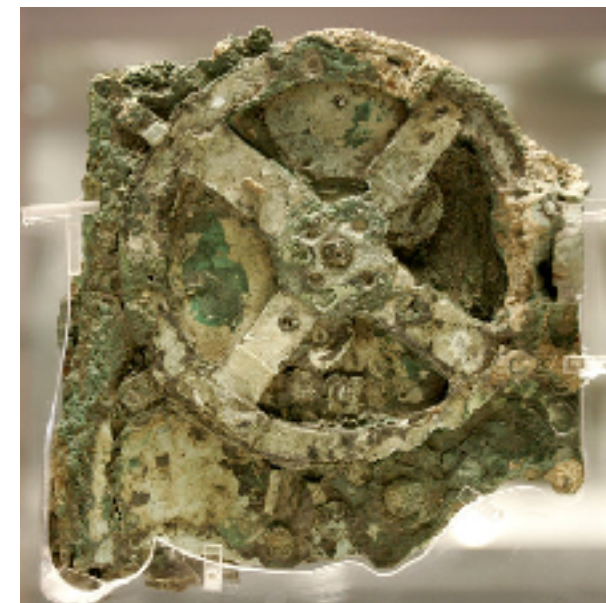
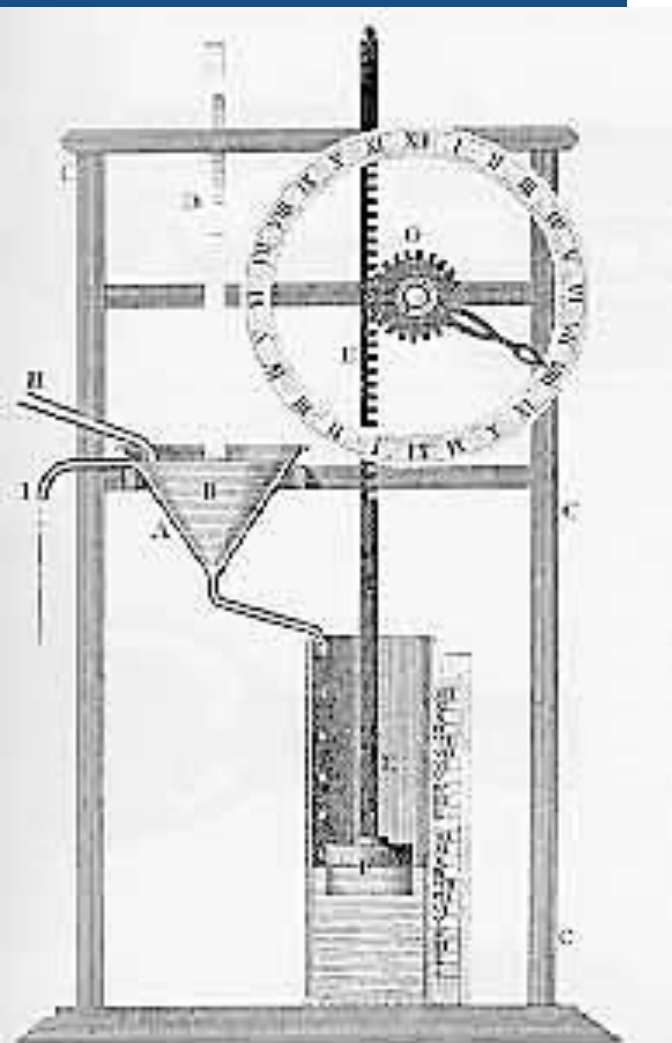


3500 bce: sundials

1400 bce: Egyptian water clocks

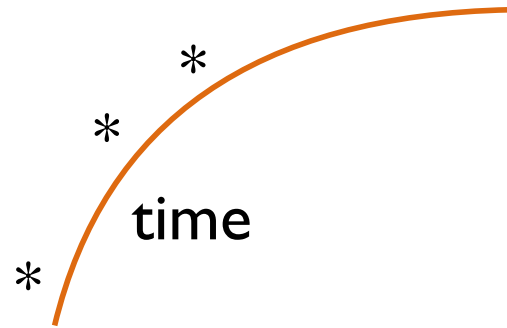
200 bce: antikythera

700 ce: hourglasses



"For good measure, the mechanism also tracked the dates of the Olympic Games."

"The third Epocha is that of the *Olympic* Games..." — Mather



"Wel sikerer was his crowyng in his logge
Than is a klokke, or an abbey orlogge"

higher tech



Richard of
Wallingford
1292-1336

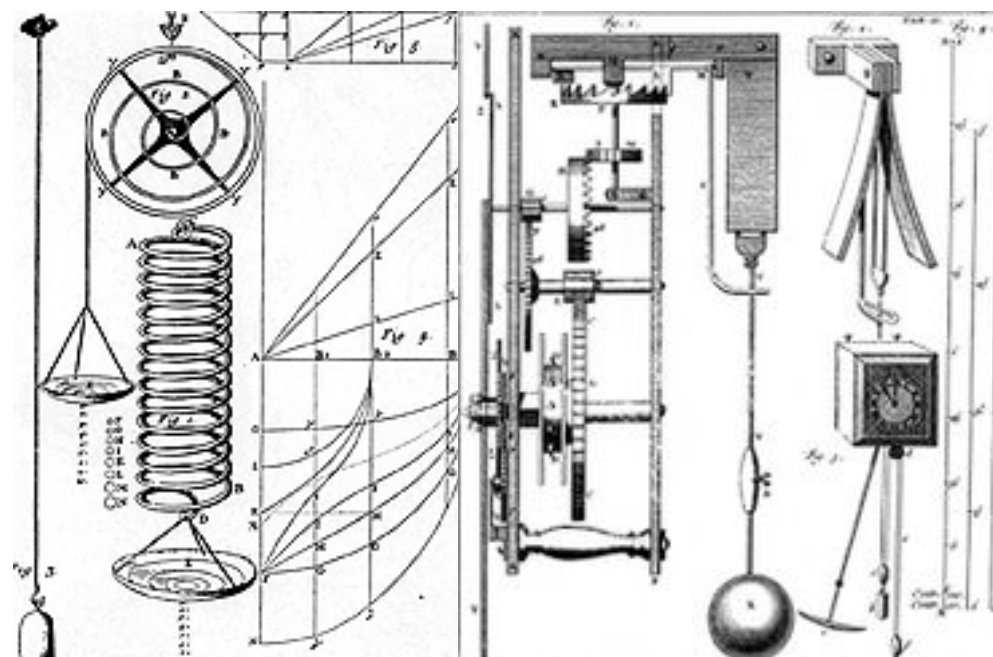
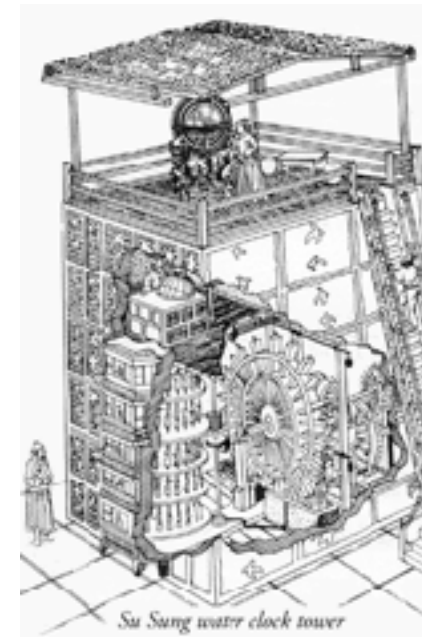
1086: Su Sung's water tower

1300: mechanical clocks
Richard of Wallingford

scientific wars:

1656: Huygens pendulum clock

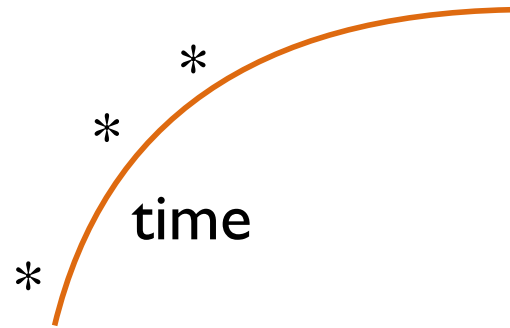
1660: Hooke & the spring watch



philosophical wars



c. 1700: Newton vs Leibniz
nature: entropy or self-sustaining



8th century bce: 10 month calendar
713 bce: 2 months added
153 bce: beginning of the year moved
from March to January

Roman rules

This Method was, however, attended with great Difficulty, and, at the same Time, rendered the Method of fixing the Dates of memorable Events abstruse and uncertain. *Julius Caesar*, therefore, about 46 Years before the Birth of *Christ*, undertook to rectify the Confusion that must attend a Variety of Accounts, knowing that his Order, as coming from the Emperor of the *Romans*, would be immediately obeyed in a very considerable Part of the World, and, in Time, spread into other Nations. In order to this he decreed, that every Year, except the fourth, should consist of 365 Days, and the fourth of 366. This Decree was founded on the Authority of *Solomon*, an eminent Mathematician of *Alexandria*, in *Egypt*, who had found, by Experience, that the Year consisted of 365 Days and a Quarter; the true Reason, therefore, why every fourth Year was to consist of 366 Days, was to compensate for the Quarter of a Day omitted in each of the three preceding Years. And this Method of computing Time is that called the *Julian Account* or *Old Style*, which continued in most *Christian* States till the Year 1582.

Julius Caesar (100 - 44 bce)

Julian Calendar

fixing the troublesome equinox

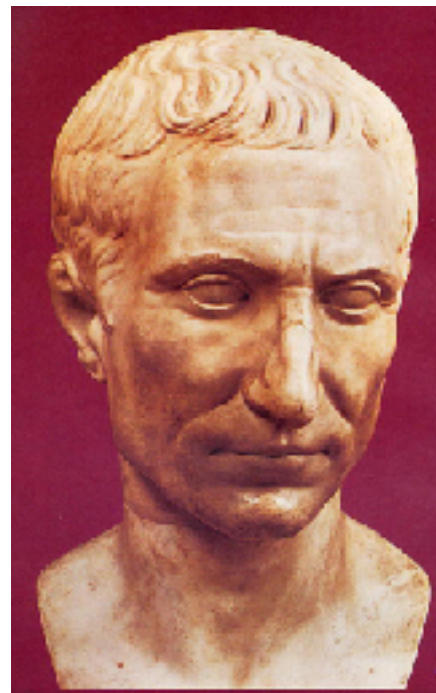
46 bce: 445 days

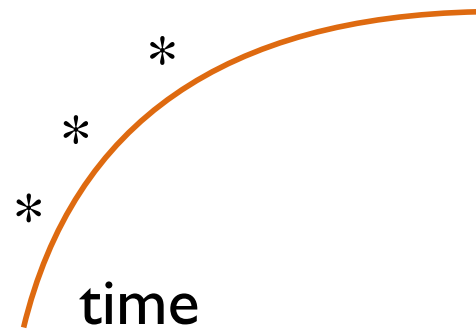
45 bce: 365

Augustus (63 bce - 14 ce)

8 bce: a further course correction

Augustan Calendar





still playing with time

... or time playing with us? New Year delayed by one second

🕒 31 December 2016 | UK



A "leap second" will be added to this year's New Year's countdown to compensate for a slowdown in the Earth's rotation.



Luigi Lilio
d 1576



Gregory XII
1502–1585

“The seventh EPOCHa is that of the Birth of Christ,
which happened in the Year of the World 4004.” — Mather

further uncertainties

the year dot:

Dionysius Exiguus (c 470-544 ce)

day one

January 1 (Julian Calendar)

March 25 (Ascension, Council of Tours, 567)

the equal hour

14th century

the struggle for Easter

1582: Gregorian Calendar (leap years, centurial years)

the big leap

Thursday October 4 to Friday October 15

`java.lang.Object`

`java.util.Calendar`

`java.util.GregorianCalendar`

`public class GregorianCalendar`

`extends Calendar`



John Wallis
1616–1703

QUARTER DAYS

Lady Day 25 March
Midsummer 24 June
Michaelmas 29 Sept
Christmas 25 Dec

old time religion

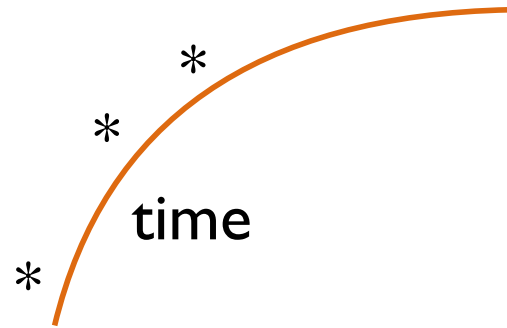
Orthodox & Protestant resistance

"latent Popish interest"

--John Wallis, **FRS**,
Savilian Professor of Geometry, Oxford

popular superstition

The Landlord calls for Rent before 'tis due,
King's Tax, and Windows, Poor, and Parson too;
With Numbers more, our Grandsires never knew.
Domestick Servants all will have their Pay,
And force their Masters e're the Quarter Day.



behind the times

Si, à l'expiration des six années, le présent Traité n'est pas dénoncé un an à l'avance, il continuera à être obligatoire d'année en année, jusqu'à ce que l'une des deux Hautes Parties contractantes ait annoncé à l'autre, mais un an à l'avance, son intention d'en faire cesser les effets.

En foi de quoi, les Plénipotentiaires respectifs ont signé le présent Traité et y ont apposé le cachet de leurs armes.

Fait à Saint-Petersbourg, le 14 (9) juin de l'an de grâce 1857.

(L. S.) Signé MORNY.

(L. S.) Signé GORTCHACOW.

(L. S.) Signé BROCK.

real leap years

Anglo-Saxons

Wednesday September 2, 1752

Thursday September 14

— Pepys, Diary
November 2, 1666; February 3, 1666/7

Russia

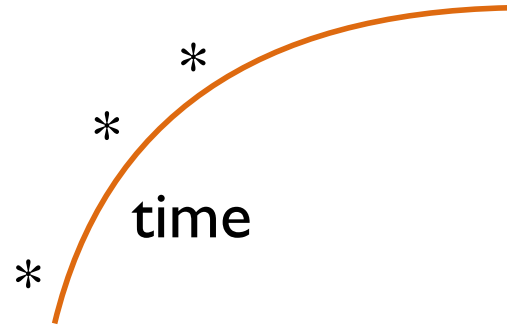
Wednesday Jan 31, 1918

Thursday Feb 14, 1918

Turkey

December 18, 1926

January 1, 1927



more revolutionary change



French decimalization

year 1 again (1793)

10 days a week

10 months a year

New Year September

an urban revolution?

Vendémiaire, Brumaire, Frimaire, Nivôse, Pluviôse, Ventose, Germinal, Floréal, Prairial, Messidor, Thermidor, Fructidor



going global

standardization and resistance

c1850: telegraph time

1852: Greenwich mean time

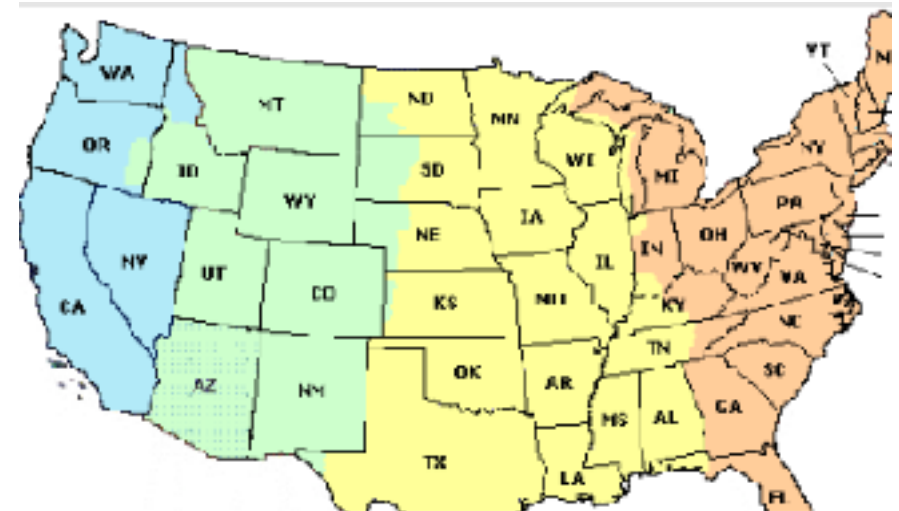
1883: US standard time

1884: Meridian Conference, DC

1911: France: Cassini Meridian

1966: Uniform Time Act

[cp Franklin,
letter to *Journal of Paris*, 1784]





going global

standardization and resistance

c1850: telegraph time

1852: Greenwich mean time

1883: US standard time

1884: Meridian Conference, DC

1911: France: Cassini Meridian

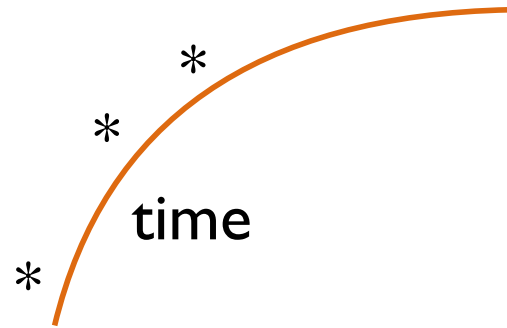
1966: Uniform Time Act

... ..



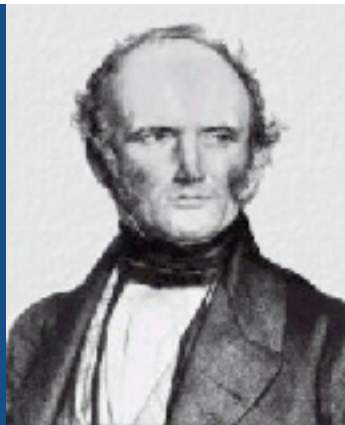
NEWS

Eight more years of leap-second problems loom as governments punt decision to 2023

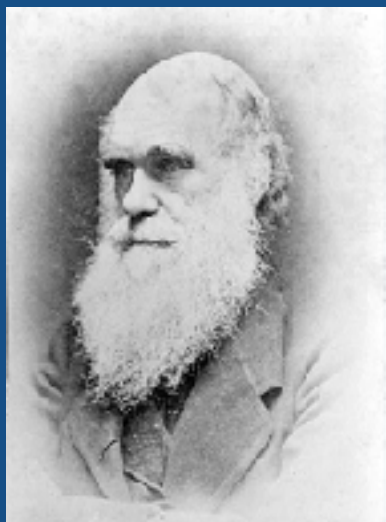


"The seventh Epocha is that of the Birth of Christ, which happened in the Year of the World 4004." — Mather

deep time



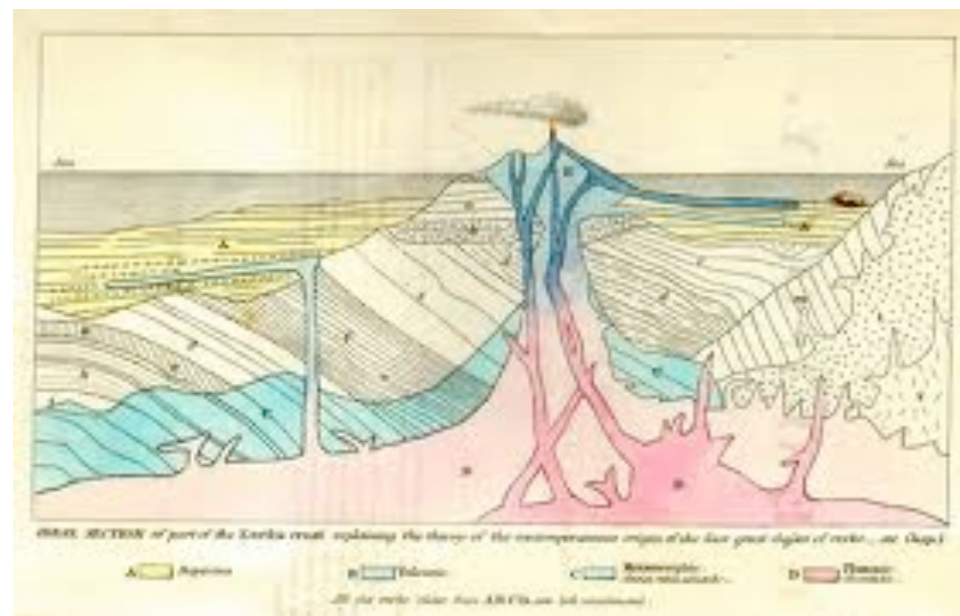
Charles Lyell
1797–1875



Charles Darwin
1809–1882

geological time

Lyell: "time, time, time"



Darwin: "I really think my books come half out of Lyell's brain."

4713 - **Chinese**

New Year: Feb 8 (monkey)

1395 - **Persian**

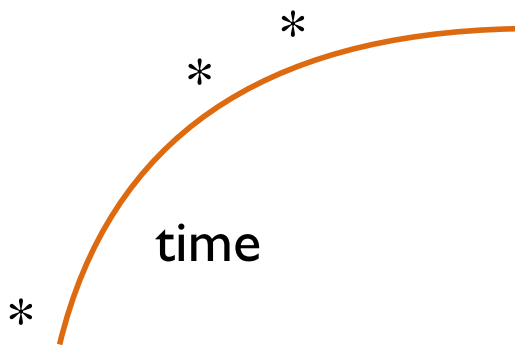
New Year: March 19

5776 - **Jewish**

New Year: September 14

1437 - **Islamic**

New Year: October 14



taking a toll — time control



bell tolling

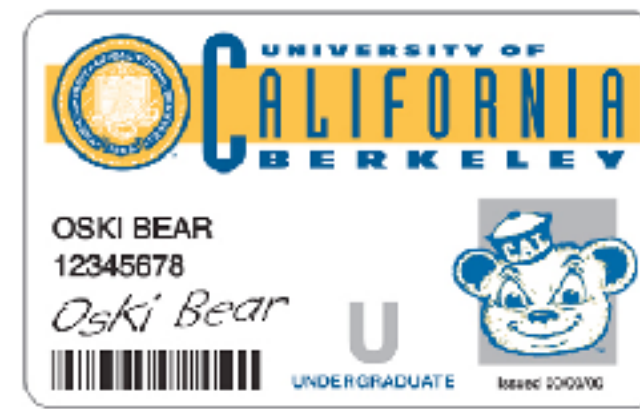
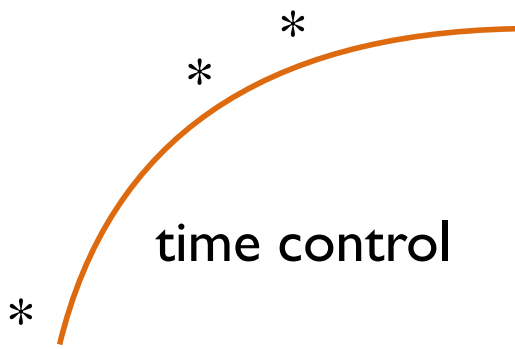
1335: Amiens start of work, lunch, end of the day
controlled by bell rung by the city

--decree of Phillip VI

1664: "to ring out the bell belonging to the said
parish church ...that as many as might live within
the sound might be thereby induced to a timely
going to rest in the evening, and early arising
in the morning to the labours and duties of their
several callings"

—Wokingham Parish, England

28



factory discipline

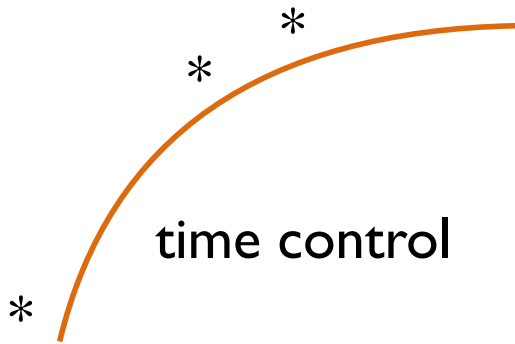
Wedgwood's Etruria

"the first recorded system of clocking-in"

"tell-tale clocks"

coming up:
advertising
March 9





time, money, & education

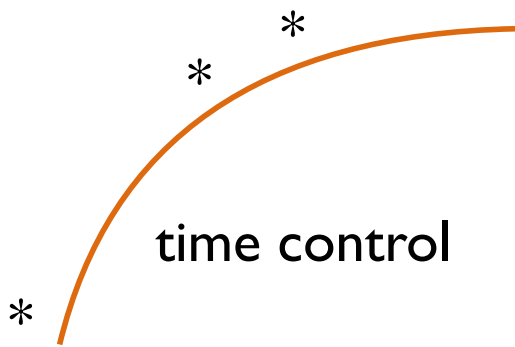
"The
Nonequivalence
of High School
Equivalents"

Stephen V. Cameron &
James J. Heckman, 1991

Wedgwood to Wordsworth

"They who have the art
To manage books, and things, and make them work
Gently on infant minds as does the sun
Upon the flower – the tutors of our youth,
The Guides, the Wardens of our faculties,
And Stewards of our labour, watchful men
And skilful in the usury of time,
Sages, who in their prescience would controul
All accidents, and to the very road
Which they have fashion'd would confine us down,
Like engines."

—William Wordsworth, *Prelude*, 1850



closer to home



confining us down like engines?

"There is a time when the operation of the machine becomes so odious, makes you so sick at heart, that you can't take part; you can't even passively take part, and you've got to put your bodies upon the gears and upon the wheels, upon the levers, upon all the apparatus, and you've got to make it stop. And you've got to indicate to the people who run it, to the people who own it, that unless you're free, the machine will be prevented from working at all!"



Laurence Sterne
1713–1768

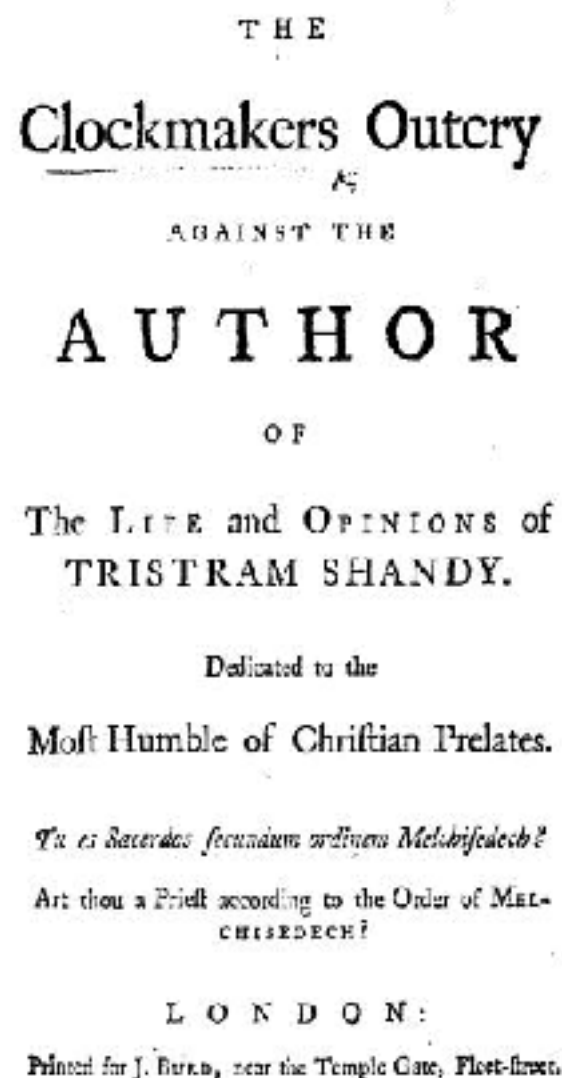
personal time

Pray dear, quoth my mother, have you not forgot to wind up the clock? Good G--! cried my father...Did ever woman, since the creation of the world, interrupt a man with such a silly question?

— Laurence Sterne, *Tristram Shandy*, 1759-1767

"No modest lady dares to mention a word about winding up a clock ...Nay, the common expression of street-walkers is, "Sir, will you have your clock wound up"

--*The Clockmaker's Outcry against the Author*, 1760





do technologies control us?

77% of women who voted, voted yes

52% of men

equal control?

ADRIANA

Neither my husband nor the slave return'd,
That in such haste I sent to seek his master!
Sure, Luciana, it is two o'clock.

LUCIANA

Perhaps some merchant hath invited him,
And from the mart he's somewhere gone to dinner.
Good sister, let us dine and never fret:
A man is master of his liberty:
Time is their master, and, when they see time,
They'll go or come: if so, be patient, sister.

ADRIANA

Why should their liberty than ours be more?

LUCIANA

Because their business still lies out o' door.

ADRIANA

Look, when I serve him so, he takes it ill.

LUCIANA

O, know he is the bridle of your will.

ADRIANA

There's none but asses will be bridled so.

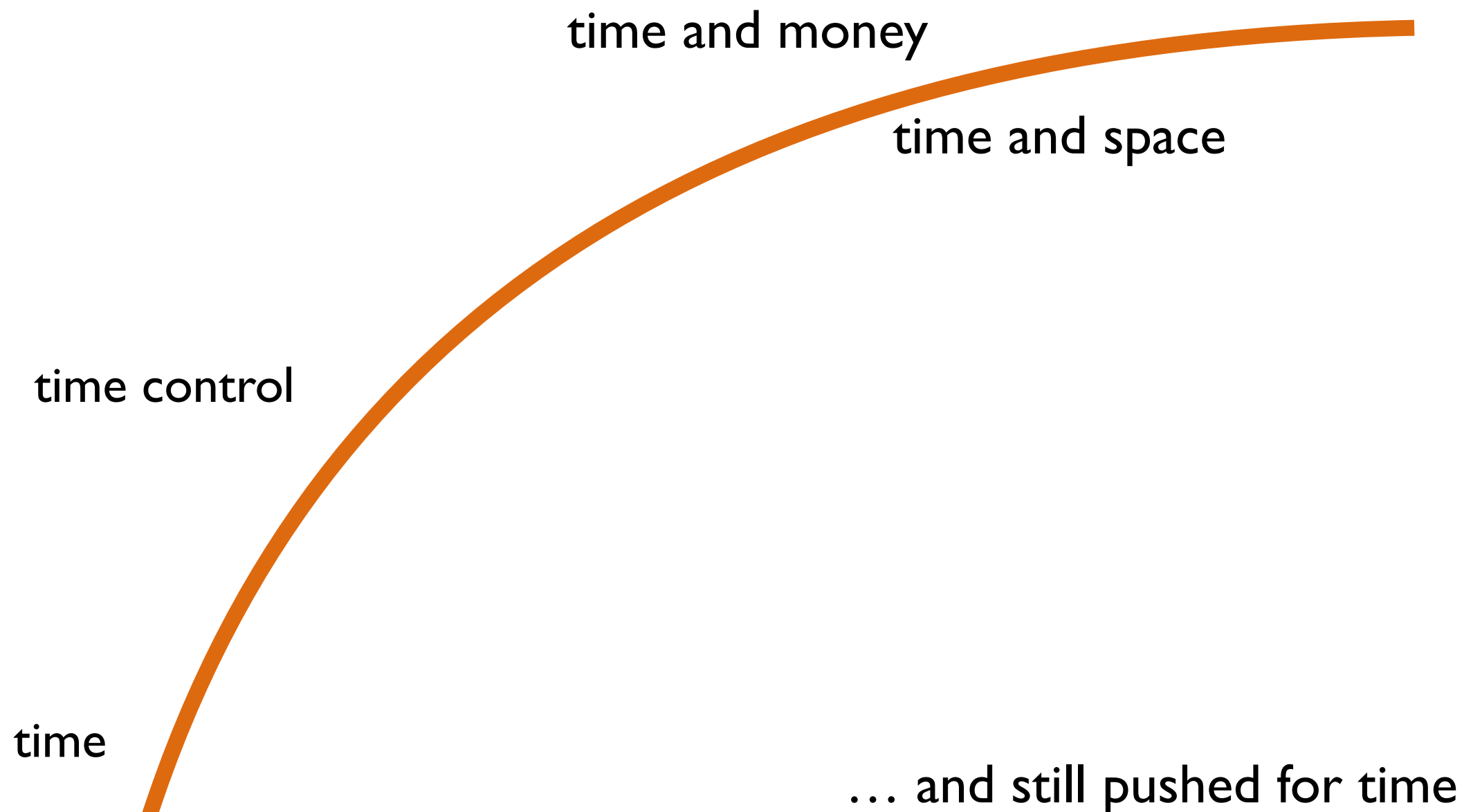
LUCIANA

Why, headstrong liberty is lash'd with woe.
There's nothing situate under heaven's eye
But hath his bound, in earth, in sea, in sky:
The beasts, the fishes, and the winged fowls,
Are their males' subjects and at their controls:
Men, more divine, the masters of all these,
Lords of the wide world and wild watery seas,
Indued with intellectual sense and souls,
Of more preeminence than fish and fowls,
Are masters to their females, and their lords:
Then let your will attend on their accords.

Time
Space
Money

"I wasted time, and now doth time waste me;
For now hath time made me his numbering clock:
My thoughts are minutes; and with sights they jar
Their watches unto mine eyes"

— *Richard II*



In a Mile are

8 Furlongs. 5280 Feet.
320 Poles. 63360 Inches.
1760 Yards. 190080 Barley-Corns.

Land Measure.

5 Yards and an Half, 1 Pole, Perch, or Rod.
40 Poles make 1 Furlong, or Quarter of an Acre.
160 Poles in Length, and 1 in Breadth, is 1 Acre.
80 Poles in Length, and 2 in Breadth, 1 Acre ; and
40 Poles in Length, and 4 in Breadth, 1 Acre.
4 Poles in Length make 1 Chain.
10 Chains in Length, and 1 in Breadth, make 1 Acre.

"Land is usually measured by the Acre; the Dimensions are taken with a ... Chain called Gunther's Chain ... divided into 100 equal parts." —Fisher

overland: westward
the course of chains ...



Gunter's chain

1 chain $\overbrace{\text{-----}}^{66 \text{ ft.}}$
= ----- 100 links
4 poles $\overbrace{\text{-----}}^{16.5 \text{ ft.}}$ $\overbrace{\text{-----}}^{16.5 \text{ ft.}}$ $\overbrace{\text{-----}}^{16.5 \text{ ft.}}$ $\overbrace{\text{-----}}^{16.5 \text{ ft.}}$
(or rods)

10 chains = 1 furlong

10 square chains = 1 acre

80 chains = 5,280 feet = 1 mile



The American Young Man's best Companion. 8th Edition
In a Mile are
 8 Furlongs. 5280 Feet.
 320 Poles. 63360 Inches.
 1760 Yards. 190080 Barley-Corns.

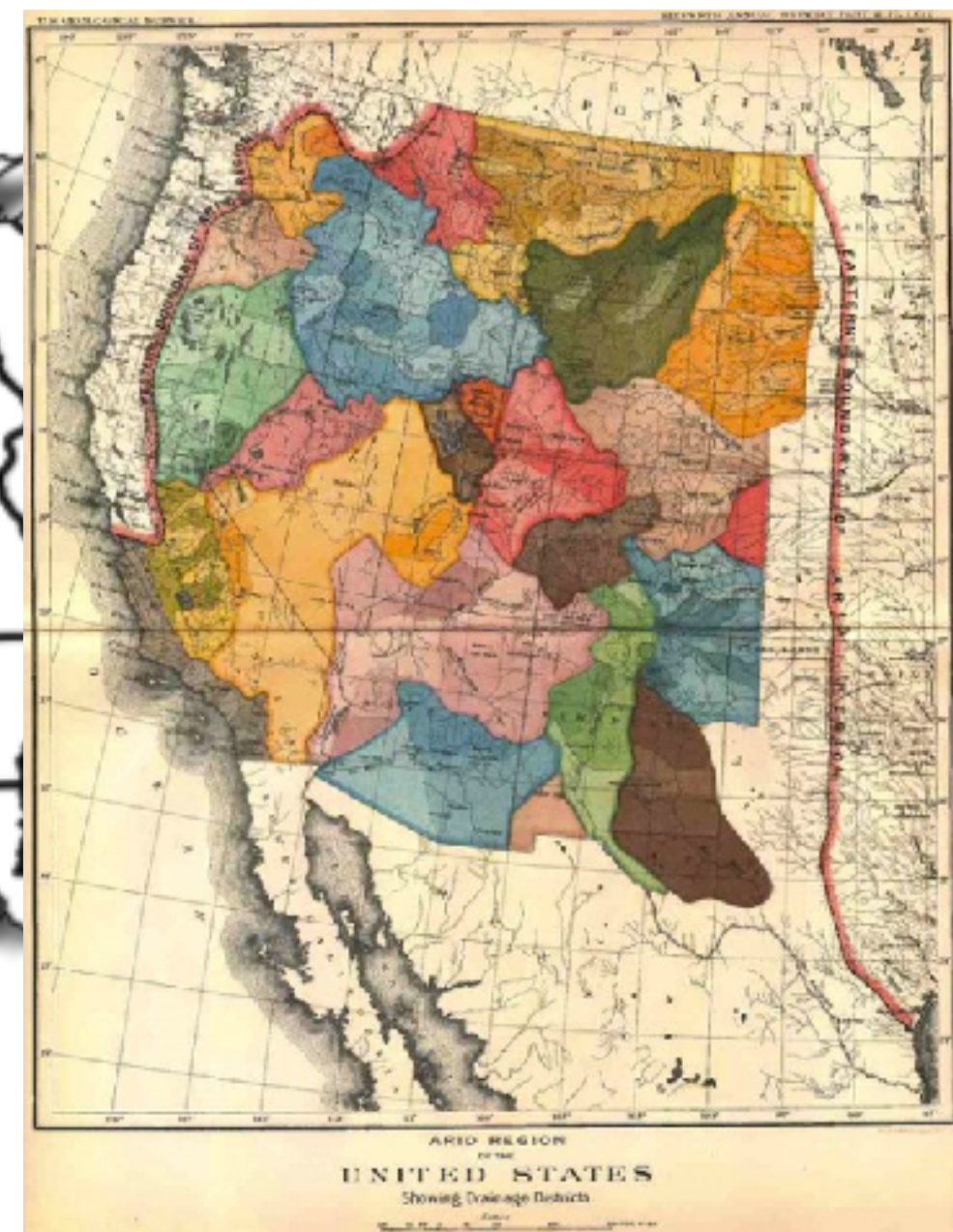
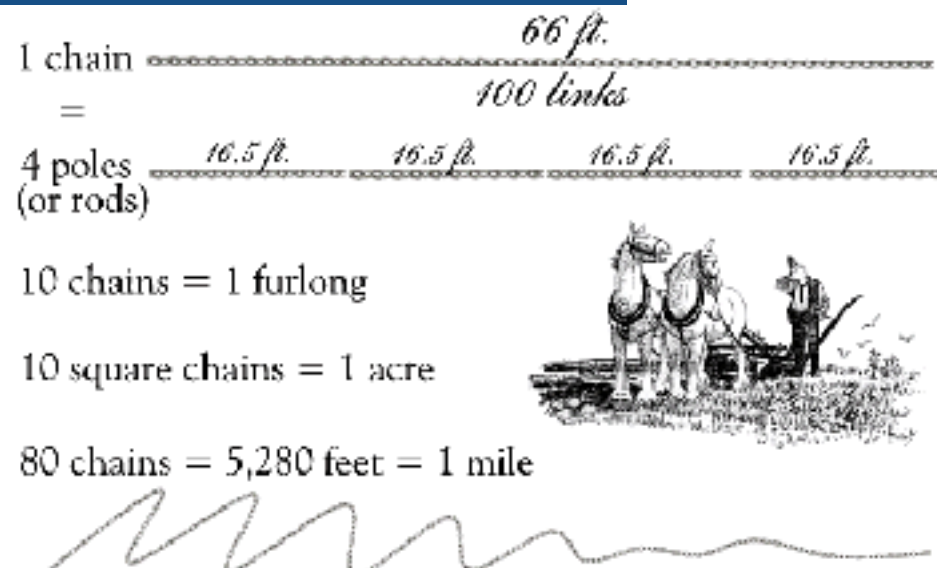
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overland: westward the course of chains ...



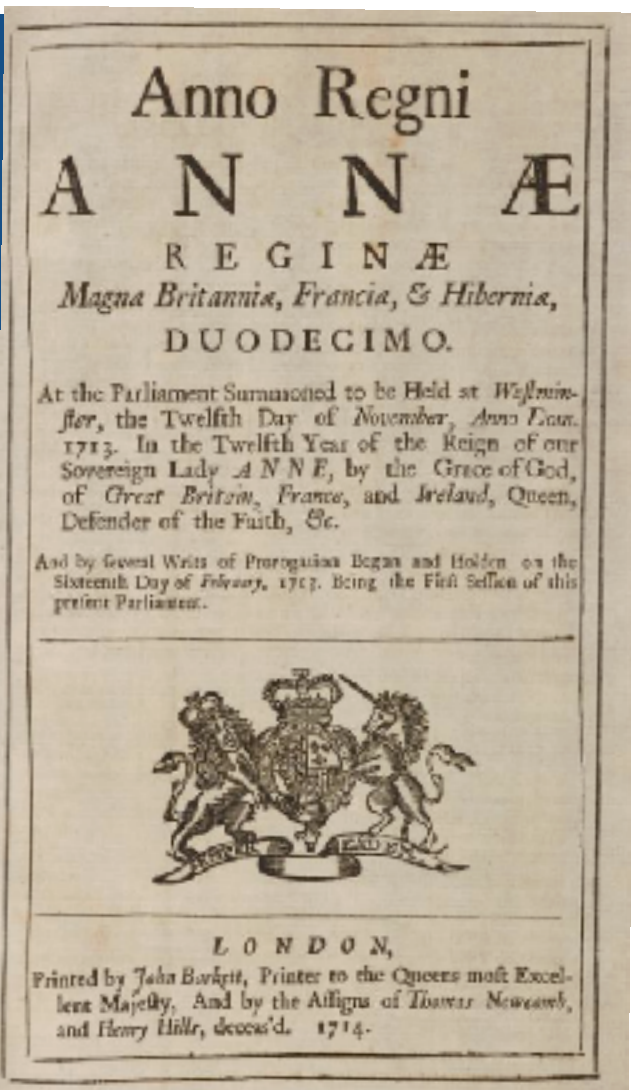
Gunter's chain



J.W. Powell's view, c. 1879



logs to longitude



time, space, and naval supremacy

starvation, piracy, wrecks

1480: *Regimento do Astrolabio e do Quadrante*
[Portugal]

1707: Sir Cloudesley Shovell's fleet
1,315 sailors; one survivor

1714: Longitude Act

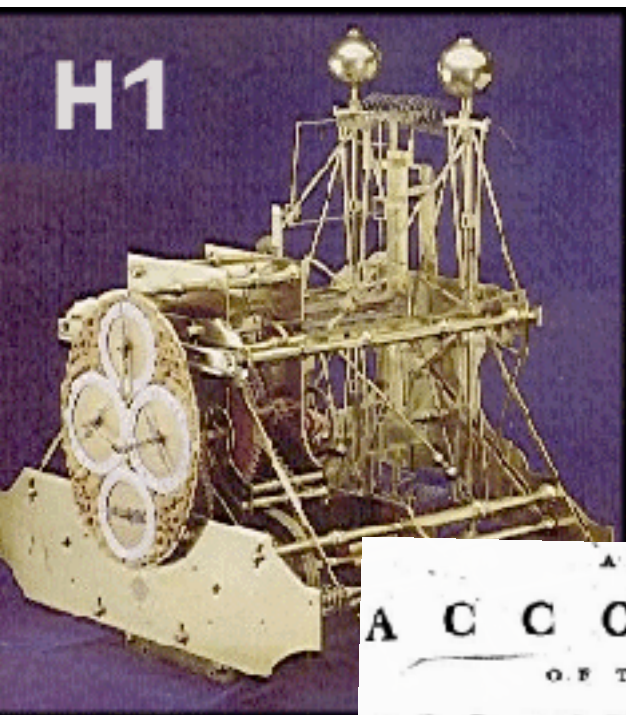
£20,000 - to fix longitude to half a degree





John Harrison
1693-1776

RS plays defense



Harrison vs Men of Science

H1 - Lisbon Trial, 1736

awarded prize, 1773

AN
ACCOUNT
OF THE
PROCEEDINGS,
IN ORDER TO THE
DISCOVERY
OF THE
LONGITUDE:
IN A
LETTER
TO THE
RIGHT HONOURABLE *****,
MEMBER OF PARLIAMENT.
L O N D O N :

Printed by T. and J. W. PATERSON, in Black-Friars, and Sold by
the BOOKSELLERS, in London and Westminster. MDCCLXXIII.

A
NARRATIVE
OF THE
PROCEEDINGS
RELATIVE TO
THE DISCOVERY OF
THE
Longitude at Sea ;
BY
Mr. JOHN HARRISON,
TIME-KEEPER;
Subsequent to those published in the Year
1763.
L O N D O N :
Printed for the AUTHOR, and Sold by
Mr. SARDY, in Fleet-Street,
MDCCLXXV.

THE
PRINCIPLES
OF
MR. HARRISON'S TIME-KEEPER,
WITH
PLATES OF THE SAME.
PUBLISHED BY ORDER OF
THE COMMISSIONERS OF LONGITUDE.
L O N D O N :
PRINTED BY W. RICHARDSON AND S. CLARK;
AND SOLD BY
JOHN NICHOL, AND MESS. MOORE AND PAUL.
M DCC LXXV.

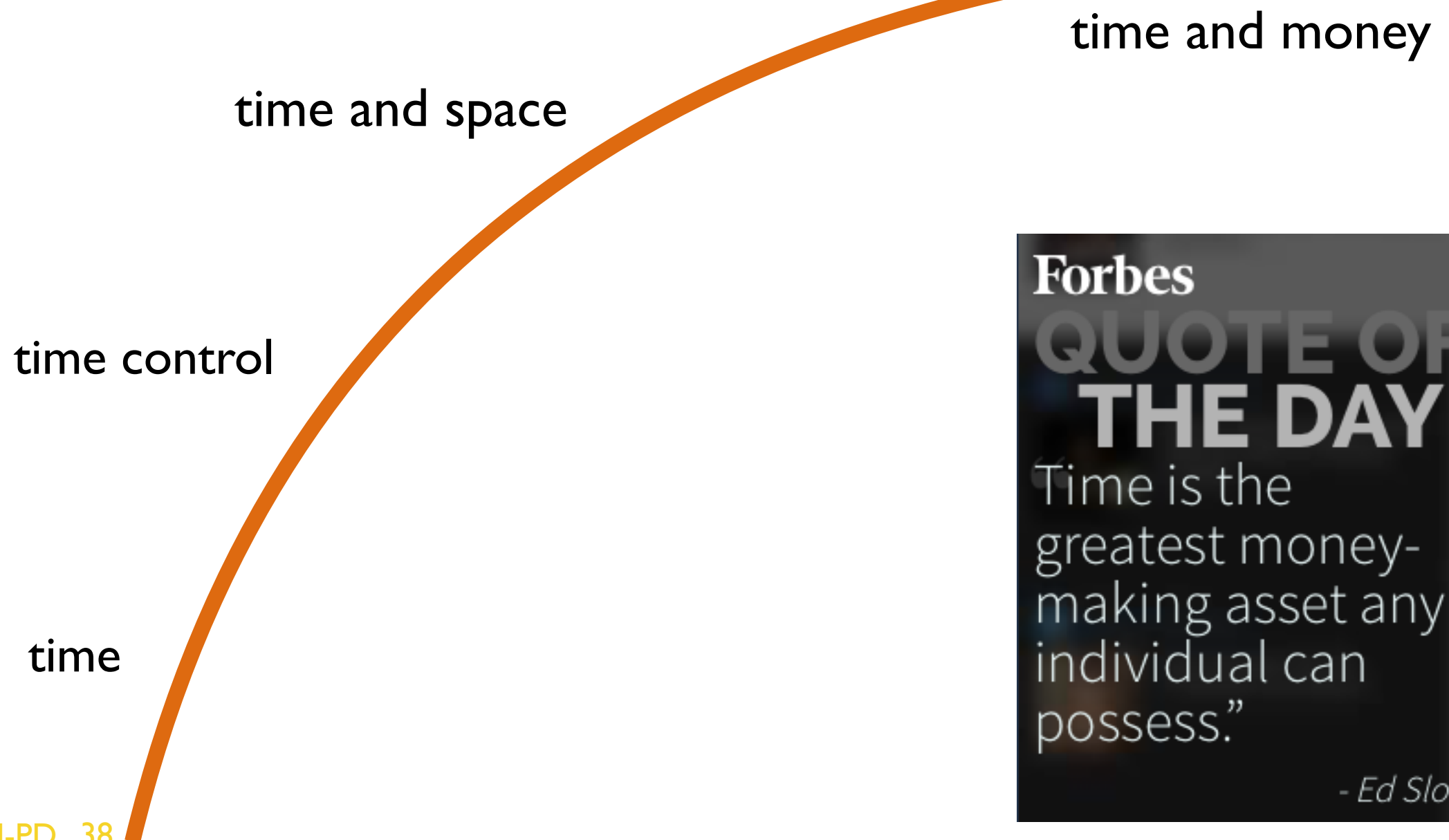
REMARKS
ON A
PAMPHLET
Last published by the
REV. MR. MASKELYNE,
Taken by Authority of the
BOARD OF LONGITUDE.
By JOHN HARRISON,
L O N D O N :
Printed for W. SARDY in Fleet-Street.
MDCCLXXV.
(PRICE SIXPENCE)

A
DESCRIPTION
CONCERNING
SUCH MECHANISM
AS WILL AFFORD A MEANS, OR TRUE
MENSURATION OF TIME;
TOGETHER WITH
SOME ACCOUNT
OF THE
ATTEMPTS for the DISCOVERY
OF THE
LONGITUDE BY THE MOON:
AS ALSO
AN ACCOUNT
OF THE
DISCOVERY
OF THE
SCALE OF MUSICK.
By JOHN HARRISON,
Inventor of the Time-Keeper for the Longitude
at Sea.
L O N D O N :
Printed by the AUTHOR, and sold by T. JONES,
No. 138, FETTER-LANE.
MDCCLXXV.

Time
Space
Money

"I wasted time, and now doth time waste me;
For now hath time made me his numbering clock:
My thoughts are minutes; and with sights they jar
Their watches unto mine eyes"

— Richard II



Forbes
**QUOTE OF
THE DAY**
"Time is the
greatest money-
making asset any
individual can
possess."
- Ed Slott

*
*
* time and money

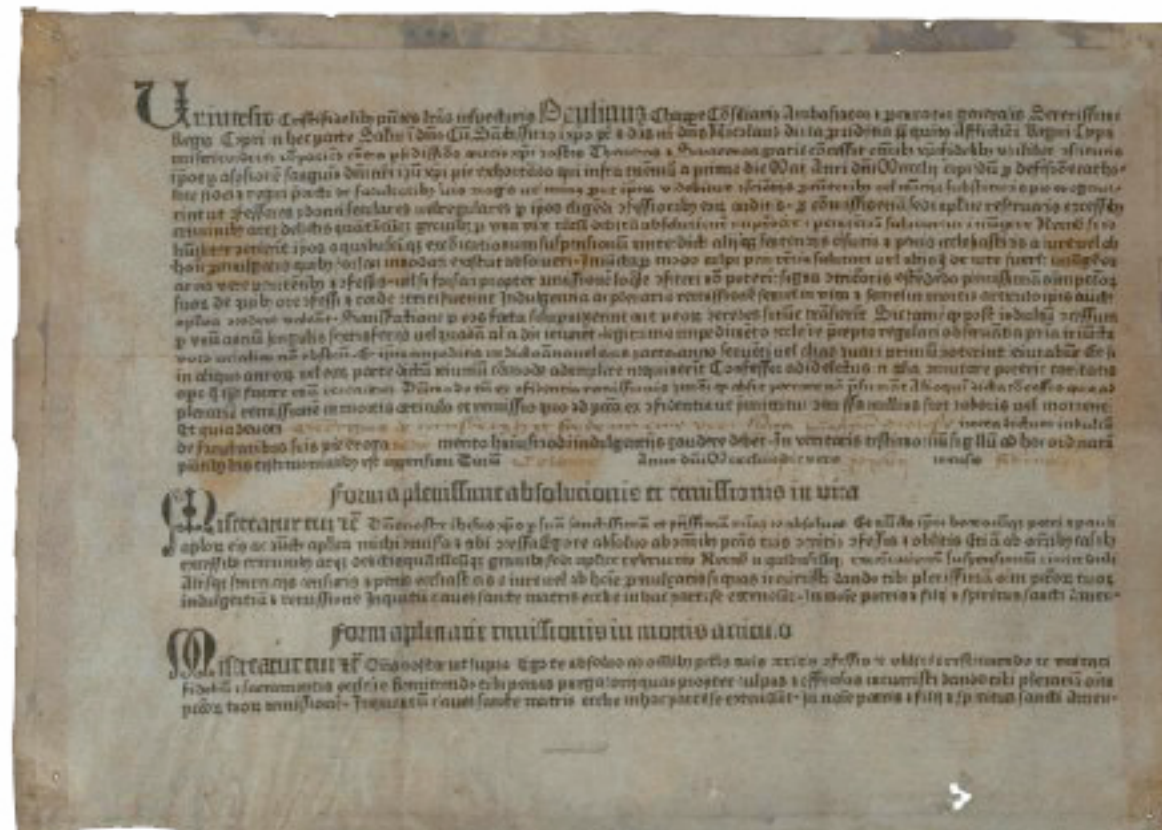
"Hear it not, Duncan, for it is a knell
That summons thee to Heaven or to Hell"
—Macbeth

a western indulgence



time, money, and eternity

1309: An indulgence to pardon a year's worth of sin costs one penny



"when I call
in my
labourers to
pay them, it
often brings
to my mind the
great and
general day of
account"

— Hannah More
Two Wealthy Farmers,
1830

Pope Clement V
1260–1314

*
*
*
time and money

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Two Wealthy Farmers,
1830



Pope Clement V
1260–1314



not so fast ... October, 1517

putting the other "Rs" in their place

"The Scientific Revolution outshines everything since the rise of Christianity and reduces the Renaissance and Reformation to the rank of mere episodes, mere internal displacements within the system of medieval Christianity."

— Herbert Butterfield,
The Origins of Modern Science, 1300-1800, 1948

really radical change



1827	Account	£	s	d
1	Wm. Gurnea	1	0	0
2	Child's books	10	6	0
3	Placed on the 3rd Cont.	300	0	0
4	Wm. Gurnea's account	69	1	9
5	Wm. Gurnea's account	1	1	0
6	Wm. Gurnea's account	1	1	0
7	Wm. Gurnea's account	22	16	0
8	Wm. Gurnea's account	7	18	6
9	Wm. Gurnea's account	5	0	0
10	Wm. Gurnea's account	42	0	0
11	Wm. Gurnea's account	7	9	8
12	Wm. Gurnea's account	16	6	0
13	Wm. Gurnea's account	3	17	0
14	Wm. Gurnea's account	3	0	0
15	Wm. Gurnea's account	1	8	1

"Then, between ... 1275 and 1325 ... Europe's first mechanical clock and canon ... marine charts, perspective painting ... and double-entry bookkeeping ... decades unmatched in their radical changes in perception until the era of Einstein ... In the past seven centuries **bookkeeping** has done more to change the perceptions of more bright minds than any single innovation in philosophy or science."

—Alfred Crosby, *The Measure of Reality*, 1997



real literacy



Sumerian tablets

record keeping

the code of Hammurabi

"if a man has given on deposit without elders
or contract ...[if] they contest it, there
shall be no claim" — Hammurabi, Babylon c 1700 bce



Rome

adversaria, codex accepti et dispensi, liber rationum



the Italian method

"The inventor of Accounting ..."
1494: Luca Pacioli *Summa de Arithmetica*

more reliable history

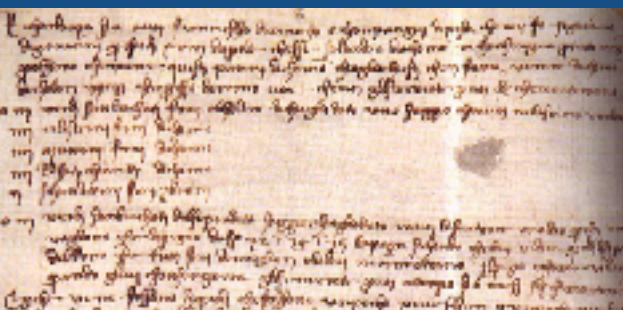
1211: proto double entry, Florence
"Arabic" numerals, via al-Khwarizmi

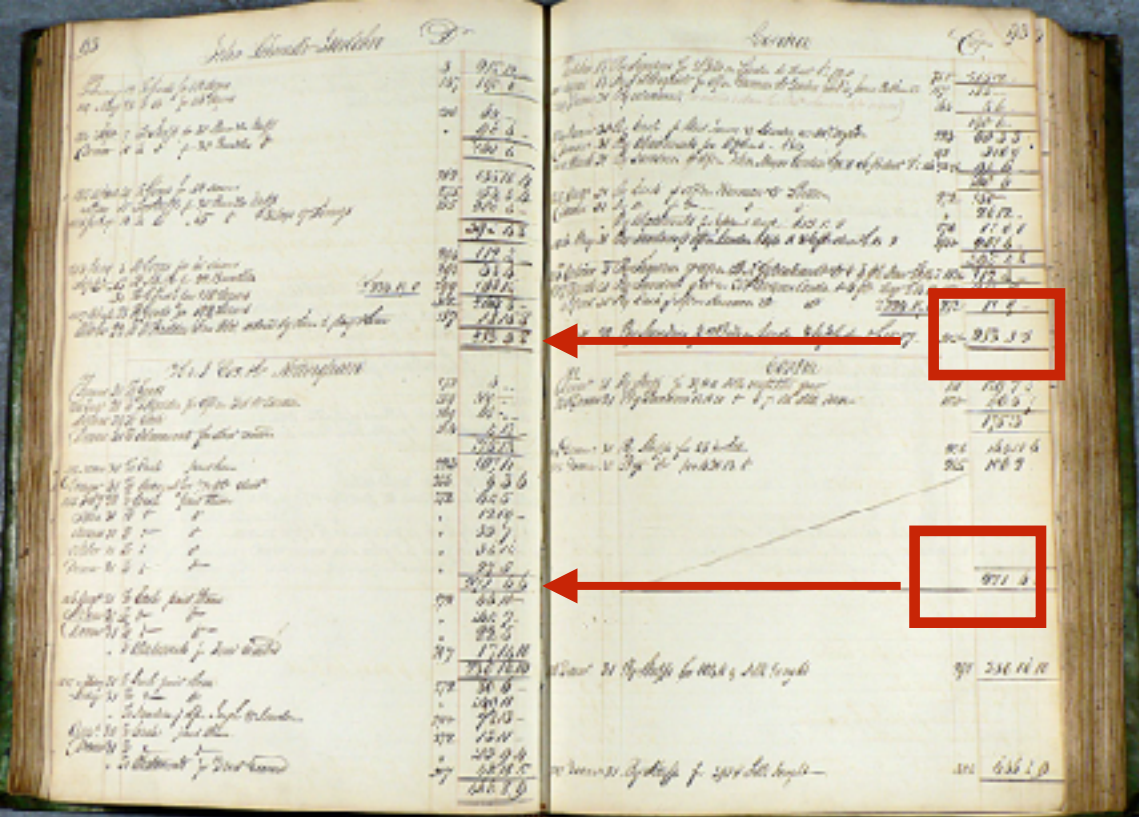
c 1340: double entry in Genoa

1366: The Merchant of Prato
(Francesco di Marco Datini)



Luca Pacioli
c 1445– 1517





the next thing

"The next Qualification to fit a Man for Business, after Arithmetick, is the Art of Book-Keeping or Merchants Accompts, after the Italian Manner, by Way of Double Entry."

books to keep: Waste-Book (Memorial), Journal, "Leidger"

time is money: goods bought at time, goods sold at time

balancing: "then cast up the Dr and Cr sides ... if they come ought both alike, .. your accompts well kept ... otherwise .. find out your error by pricking over your Books"

"... how to qualify any person for business ... write letters ... Merchants Accompts ..."

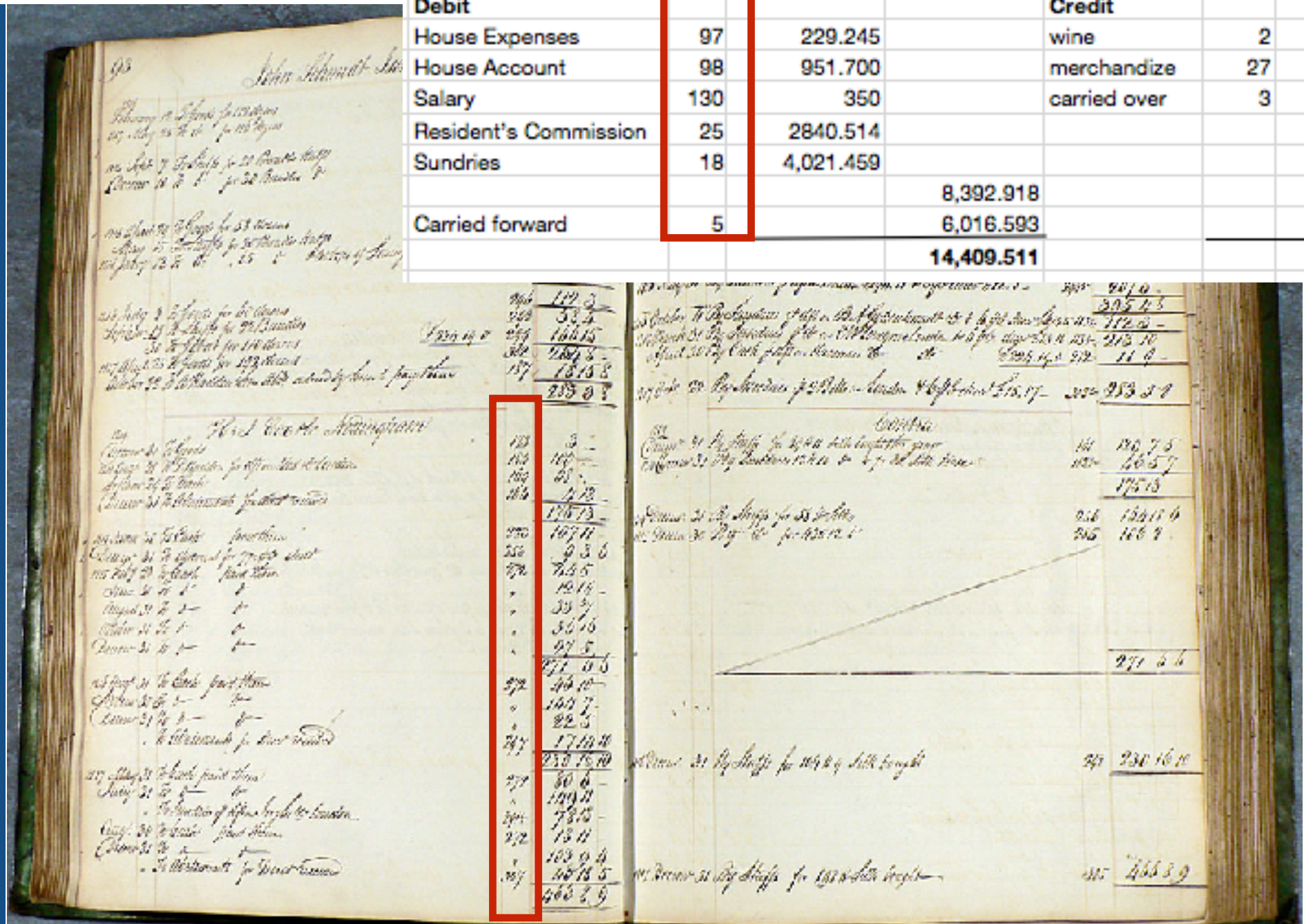
13-Hofl-2.28.17-TSM-PD 44

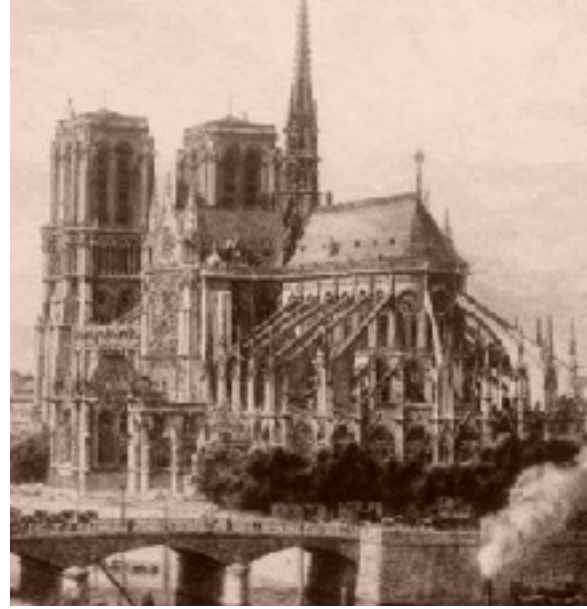
*
*
*
time and money

getting

Wine Account					
Debit				Credit	
Agio	100	2,415.694		Wine	137 63,776.900
Interest	25	2,247.172			
Cask	19	15,391.080			
Brandy	12	20,160.000			
Charges on wine	20	9,441.230			
Charges	21	1,288.387	50,943.563		
To Profit & Loss	1		12,833.337		
			63,776.900		63,776.900

Profit & Loss					
Debit				Credit	
House Expenses	97	229.245		wine	2 12,833.387
House Account	98	951.700		merchandise	27 102.800
Salary	130	350		carried over	3 1,473.324
Resident's Commission	25	2840.514			
Sundries	18	4,021.459			
			8,392.918		
Carried forward	5		6,016.593		
			14,409.511		14,409.511





"*ceci tuera cela*"

new religion

Max Weber (1864-1920)

"Protestant ethic ... rational capitalist accounting ... iron cage"

Werner Sombart (1863-1941)

"abstraction of profit [leads to] economic calculation ...
systemic organization ... depersonalization."

desacralization

"The Palace of the Bourse [stock exchange] ... The architecture of a building should be adapted to its function. As for the function ... it fills that to perfection: it is a stock exchange in France just as it would have been a temple in Greece ... on days of high religious solemnity, the theory of stockbrokers and jobbers can be majestically expounded"

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

Mercantilists like Trump look to the balance of trade as an indicator of whether a country is “winning” or “losing” at trade. But the balance of trade indicates no such thing, and that has been known for over 300 years. As a 17th century observer put it, “The Dutch we see import all, yet thrive upon trade, and the Irish export eight times more than they import, yet grow poorer.” Trump thus frets over how Mexico exports more to his country than it imports from it, but think of it another way: the United States gets all these affordable goods from Mexican producers, and it has to send back far less in return — what a bargain.

—*Montreal Gazette*

balancing acts



David Hume
1711–1776

personal and public debt

“Annual income twenty pounds, annual expenditure nineteen nineteen six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery.”

—Charles Dickens, *David Copperfield*

"apprehension of the wrong balance of trade, appears of such a nature, that it discovers itself wherever one is out of humour with the ministry, or is in low spirits."

—David Hume, "Of the Balance of Trade," 1752



5/23/06	WITHD	Good Earth Groceries	27.36	Deposit	1,669.04
		Groceries	4456 PURCHASE	Open Split	
5/23/06	EFT	Sun State Credit Cards [Sun State]	250.00		1,419.04
5/24/06	1209	Water Company	32.15		1,386.89
		Utilities:Water			
5/27/06	EFT	Phone Company	47.62		1,339.27
		Utilities:Telephone			

still going

the books & the bottom line
Quicken, Mint, TurboTax ...Intuit



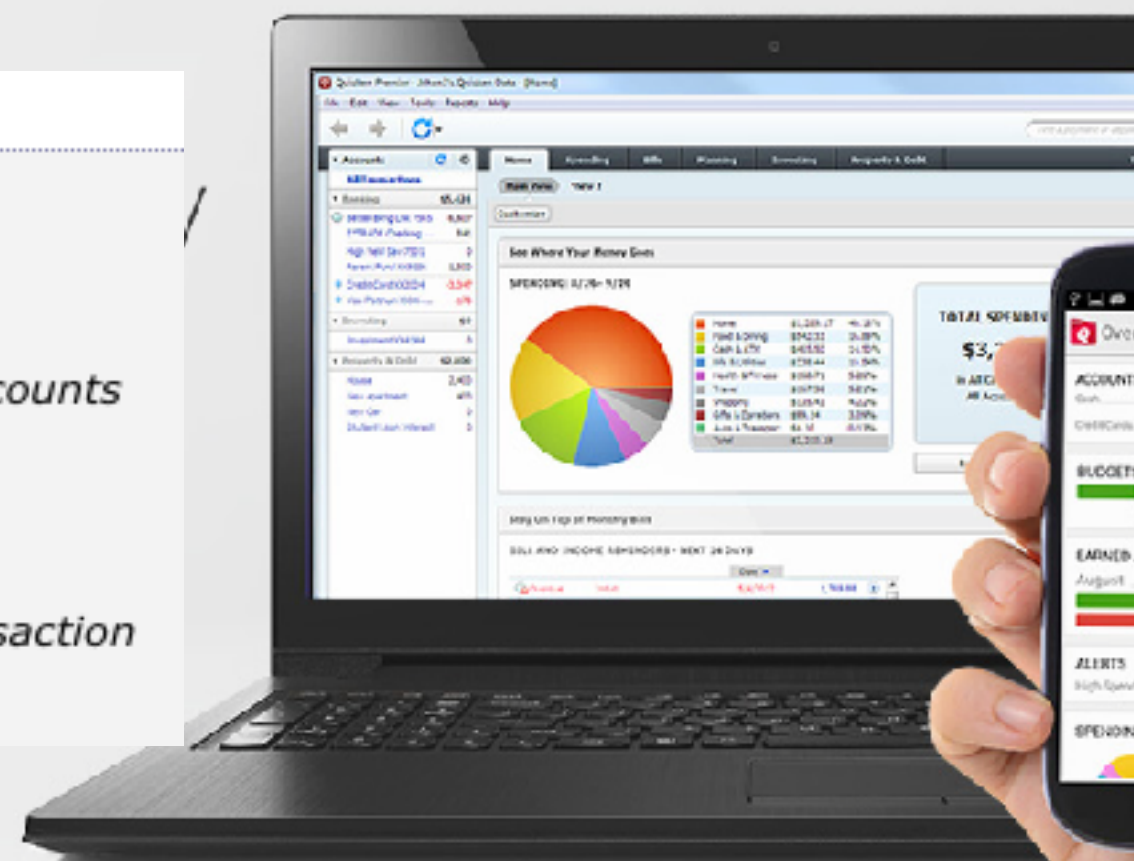
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Quicken

Personal Finance and Money Management Software

Feature Highlights

- ✓ Double-Entry Accounting
- ✓ Stock/Bond/Mutual Fund Accounts
- ✓ Small-Business Accounting
- ✓ Reports, Graphs
- ✓ QIF/OFX/HBCI Import, Transaction Matching

QUICKEN FOR MAC





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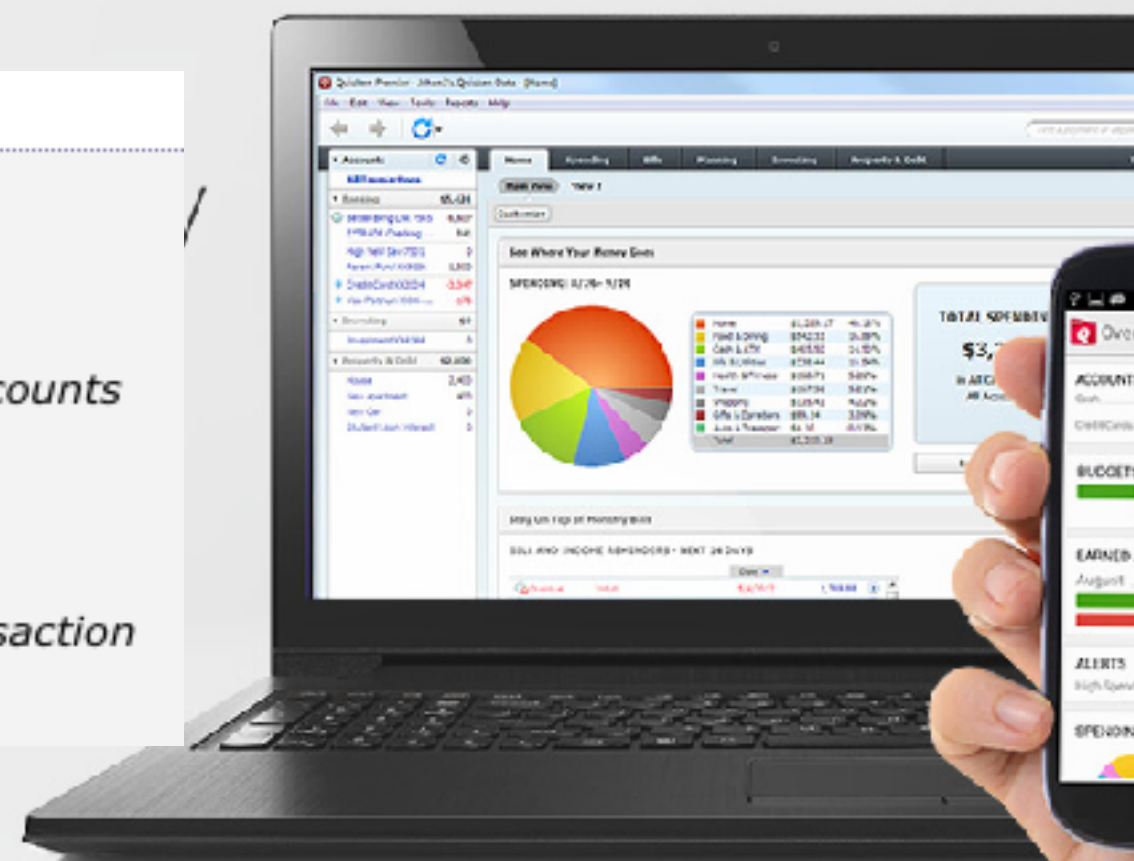
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QUICKEN FOR MAC





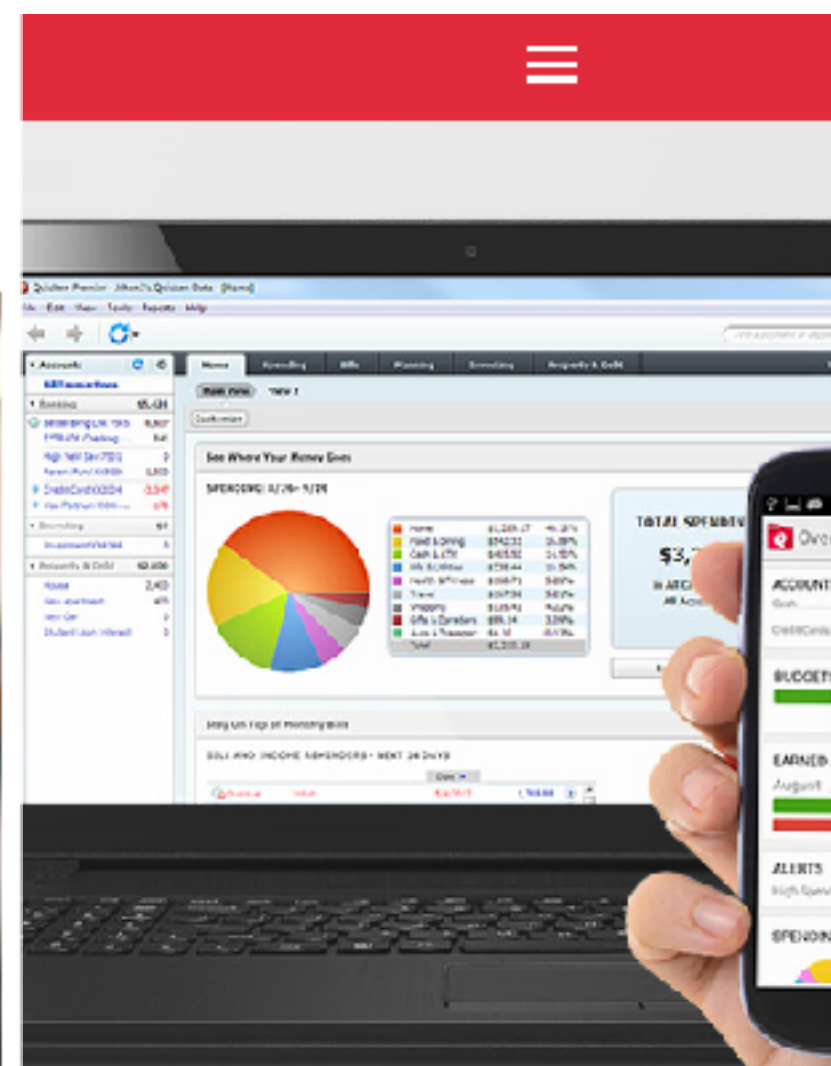
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How the Maker of TurboTax Fought Free, Simple Tax Filing





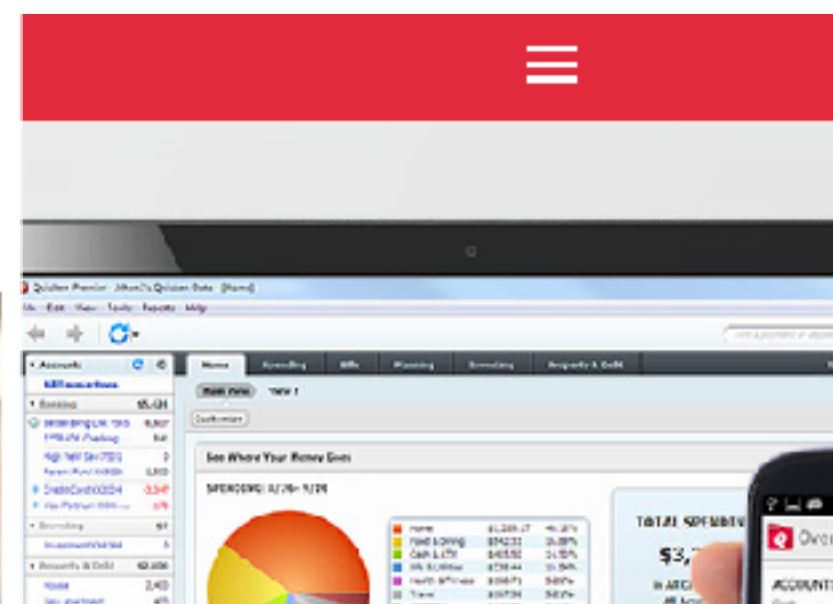
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still going



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How the Maker of TurboTax Fought Free, Simple Tax Filing





in sum

multiple literacies

coordination calls for standardization and conformity

legacy standards can be hard to change

pervasive standards tend to be invisible



coming up

2 March: Literacy and the Nineteenth Century Public Sphere

With the nineteenth-century rise of universal schooling and the appearance of the modern postal system and mass-circulation daily newspaper, we see the beginnings of our notion of mass literacy, and of the debates people have about it (even now, when talking about technology): is literacy a tool for social control or does it enable subversive thinking?

Required Reading

Freire, Paulo. 1998. "The adult literacy process as cultural action for freedom," in *Harvard Educational Review*. Cambridge; Winter. [\[link\]](#)

Henkin, David. 2006. "Becoming Postal" and "Mass Mailings" in *The Postal Age*, Chicago: University of Chicago Press.

Read: "Becoming Postal," section of ch. 1, pp.15-41 (to "New England Poets").

Source: Course reader.