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.
unnoticed revolutions?

time, space, and money
when? where? how much?

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 Idlenes, ought not to reckon that the only Expense 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 tíesdei, … the genitive of the Germanic base of the name of (the god) Tiw
pure and simple?
Anglo-Norman feverer, feverer, feveryer, feverzere, feverell, februer, februaire, etc., ... means of purification, expiatory offerings, of uncertain origin

28 February
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
“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
“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

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

SAN FRANCISCO — Online technology’s urgent emails, calendar updates and videoconferences may propel business, but the system at times seems to siphon energy from our personal lives. The answer, according to Google, is more technology.

Divide & Conquer
doesn't control — 32%
does — 55%
either /nor — 13%

Cameron Diwa
Jordan Yu
John Keane
Michael Pletta
Frederick Canas

... and no doubt pushed for time
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)
successive adaptation

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

–Linglebach, "Franklin's American Instructor" 1952
successive adaptation

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

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—Linglebach, "Franklin's American Instructor" 1952
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
... 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
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
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

Link to HBR Article: https://hbr.org/2004/10/seven-surprises-for-new-ceos
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
“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
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

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

— R.J.C. Atkinson

c. 3100 BCE

The long then

Whan that April with his shoures soote
The drogte 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...
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 clokke, or an abbey orlogge"

c. 1700: Newton vs Leibniz

* * *

Richard of Wallingford
1292–1336

scientific wars:
1086: Su Sung's water tower
1300: mechanical clocks
Richard of Wallingford

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

**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

BBC NEWS

Rebeca Morallo reports: "It's all because of a very slight wobble in the Earth's rotation"

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

**real leap years**

**Anglo-Saxons**

Wednesday September 2, 1752
Thursday September 14

**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

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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

**geological time**

**Lyell:** "time, time, time"

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

**Chinese New Year:** Feb 8 (monkey)

**Persian New Year:** March 19

**Jewish New Year:** September 14

**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

---decrees 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
factory discipline

Wedgwood's Etruria
“the first recorded system of clocking-in”

“tell-tale clocks”

coming up:
advertising
March 9
"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
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!”
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.
“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

… and still pushed for time
"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 ...
"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 —— 66 ft.

= 4 poles —— 16.5 ft. 16.5 ft. 16.5 ft. 16.5 ft.
(or rods)

10 chains = 1 furlong

10 square chains = 1 acre

80 chains = 5,280 feet = 1 mile
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
“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

"Time is the greatest money-making asset any individual can possess."
— Ed Slott
A Western Indulgence

Time, Money, and Eternity

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

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

"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
time, money, and eternity

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

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

not so fast … October, 1517

“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
"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."

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 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)
"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"
getting to the bottom line

time and money
time and money

getting
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.

**balancing acts**

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**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
still going

the books & the bottom line

Quicken, Mint, TurboTax ... Intuit
still going

the books & the bottom line

Quicken, Mint, TurboTax …Intuit
How the Maker of TurboTax Fought Free, Simple Tax Filing
How the Maker of TurboTax Fought Free, Simple Tax Filing
multiple literacies
coordination calls for standardization and conformity
legacy standards can be hard to change
pervasive standards tend to be invisible
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


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