

A Brief History of Timekeeping

Kivanc Yazan

6/21/2017

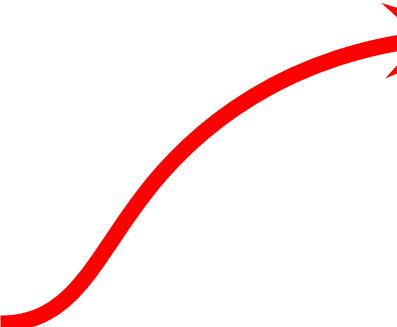
TPC

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6/21/2017

TPC



SUMMER SOLSTICE! LONGEST DAY!

It all started with..

[40 entry daha](#)

'in perl you just put random characters and hope that they're random enough to please the perl gods.'



1

18.12.2008 17:52

[kisisel bir ileti yaz](#) ...

40 entry daha

'in perl you just put random characters and hope that they're random enough to please the perl gods.'



1

18.12.2008 17:52

kisisel bir ileti yaz ...

```
{  
    entry_url      => Str  
    topic_url      => Str  
    topic_title    => Str  
    topic_channels => [Str]  
  
    author_name    => Str  
    author_url     => Str  
    author_id      => Int  
  
    body_raw       => Str  
    body_text      => Str (html tags removed)  
    body_processed => Str (html tags processed)  
    fav_count      => Int  
    create_time    => DateTime  
    update_time    => DateTime  
}
```

```
{  
    entry_url      => Str  
    topic_url      => Str  
    topic_title    => Str  
    topic_channels => [Str]  
  
    author_name    => Str  
    author_url     => Str  
    author_id      => Int  
  
    body_raw        => Str  
    body_text       => Str (html tags removed)  
    body_processed  => Str (html tags processed)  
    fav_count       => Int  
    create_time     => DateTime  
    update_time     => DateTime  
}
```

**Runtime error:
Invalid local time
for date
in time zone:
Europe/Istanbul**

Runtime error: Invalid local time for date in time zone: Europe/Istanbul

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TPC

- Why do we need Daylight Saving?

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- Which one is noon/midnight: 12AM/12PM??

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- Any alternative ways to measure time?

- Why do we need Daylight Saving?
- Which one is noon/midnight: 12AM/12PM??
- How can we have so accurate time?
- Any alternative ways to measure time?
- Time in space?

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6/21/2017

TPC

A Brief [Chronological] History of Timekeeping

Kivanc Yazan

6/21/2017

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It all started with..



13.7B years ago



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▲ **Amazon to Acquire Whole Foods for \$13.7B** ([bloomberg.com](#))

1632 points by whatok 1 day ago | [hide](#) | [past](#) | [web](#) | 794 comments | [favorite](#)

Y

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▲ [Amazon to Acquire Whole Foods for \\$13.7B](#) ([bloomberg.com](#))

1632 points by whatok 1 day ago | [hide](#) | [past](#) | [web](#) | 794 comments | [favorite](#)

▲ [joshfarrant](#) 1 day ago [-]

\$13.7B is quite a satisfying amount.

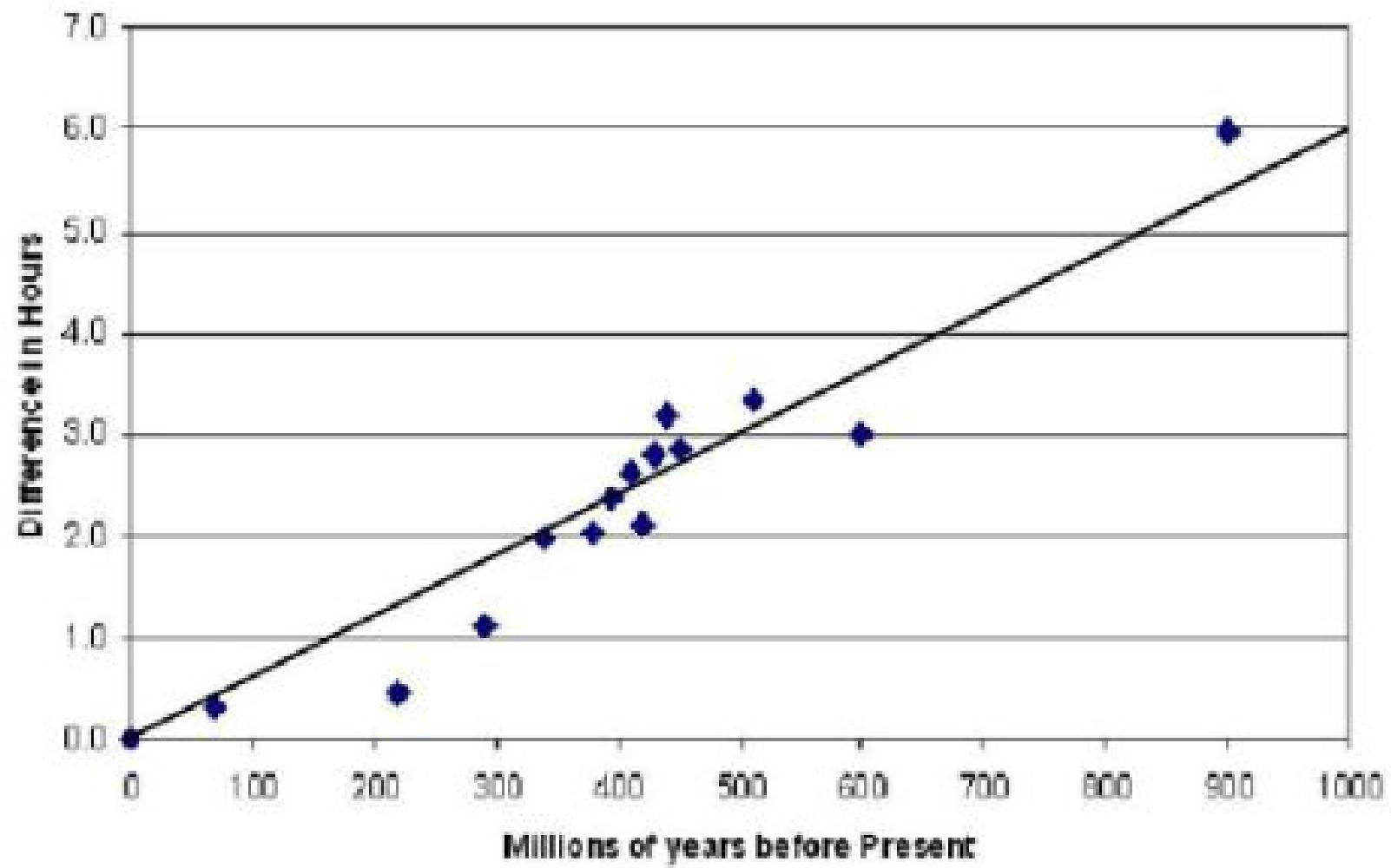
That's \$1 for every year since the Big Bang.

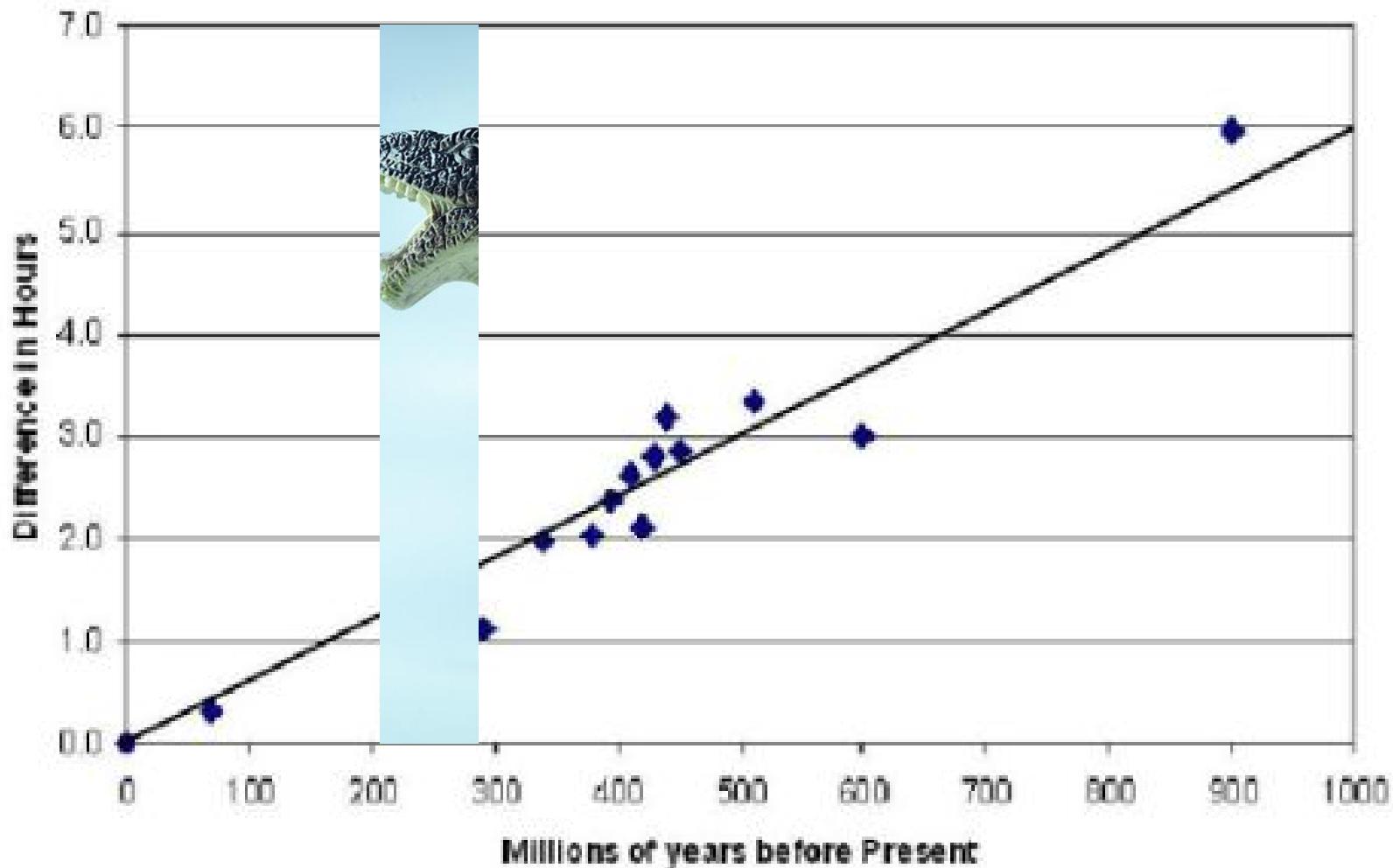
[reply](#)

Sun = 5Ba

Earth = 4.5Ba

Moon = 4.5B - 13M a





200 ka

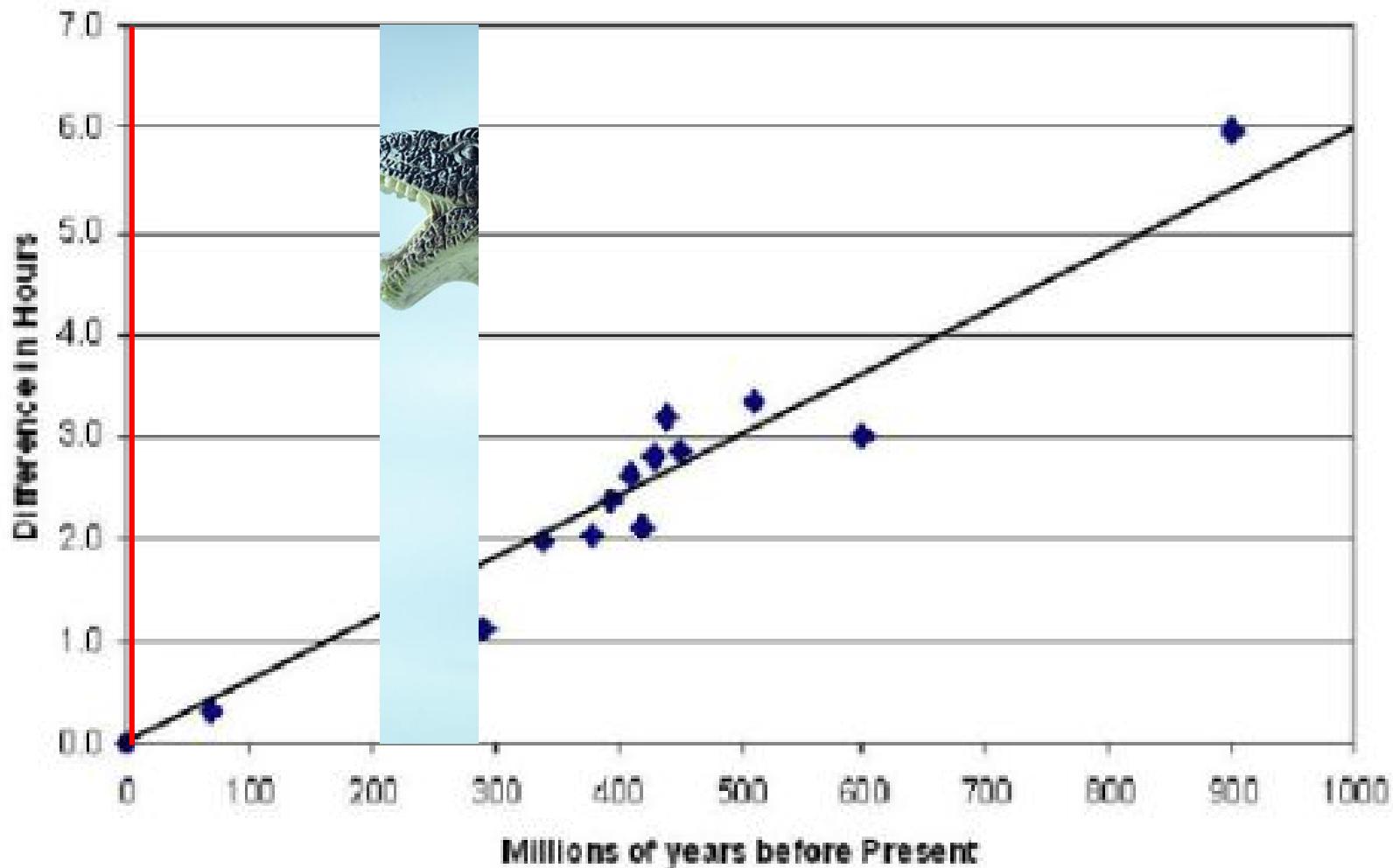
Omo1 and Omo2 sites (Omo River, Ethiopia) yield the earliest fossil evidence for anatomically modern *Homo sapiens*.^[32]

By a 2015 study, the hypothetical man Y-chromosomal Adam is estimated to have lived in East Africa about 250 ka. He would be the most recent common ancestor from whom all male human Y chromosomes are descended.^[33]

https://en.wikipedia.org/wiki/Template:Human_timeline

Hopkin, Michael (2005-02-16). "Ethiopia is top choice for cradle of *Homo sapiens*". *Nature News*. doi:10.1038/news050214-10.

Karmin, Monika et al. (April 2015). "A recent bottleneck of Y chromosome diversity coincides with a global change in culture". *Genome Research*. **25** (4): 459–466. PMC 4381518 Freely accessible. PMID 25770088. doi:10.1101/gr.186684.114.

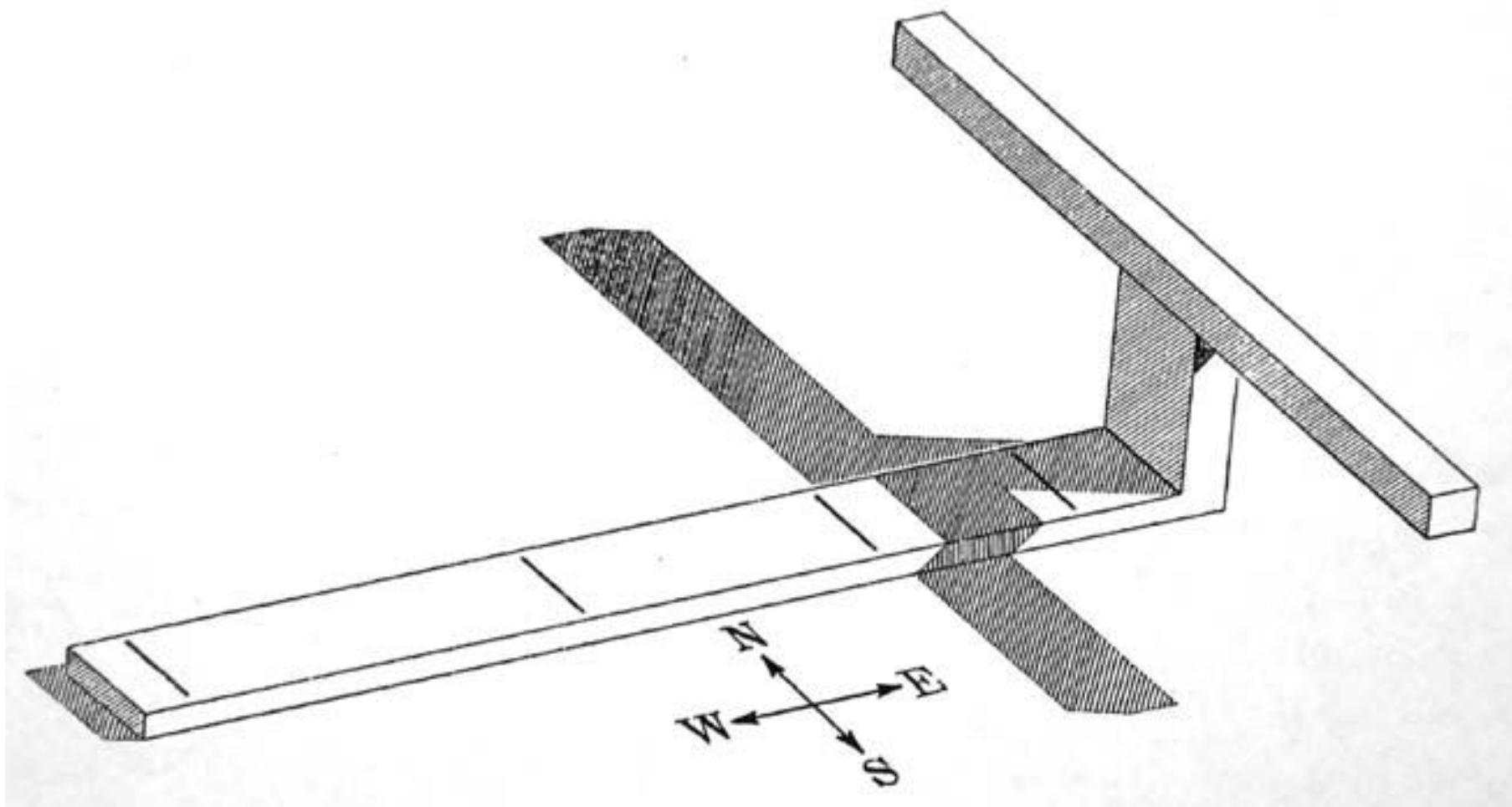


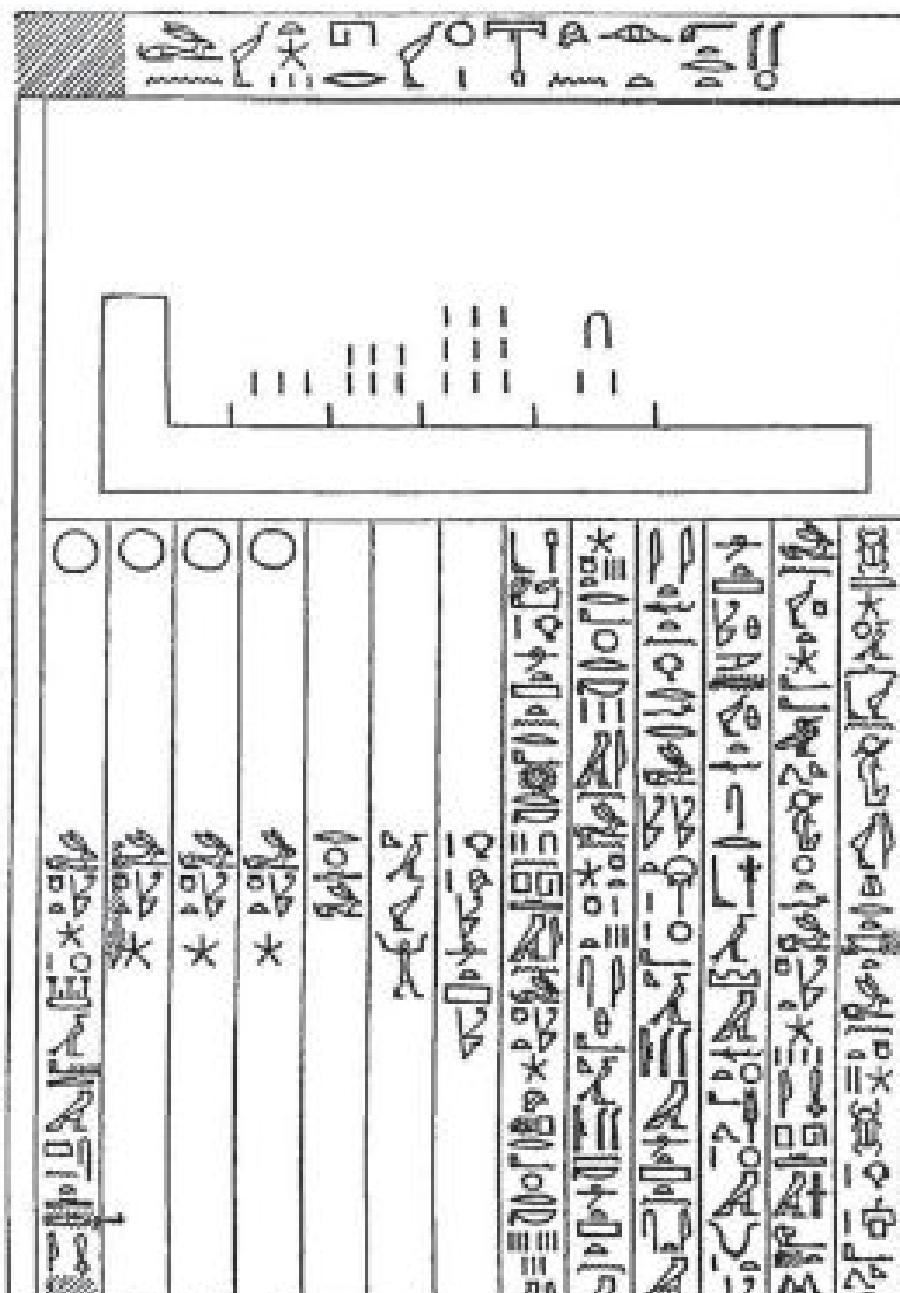
15_000 BC



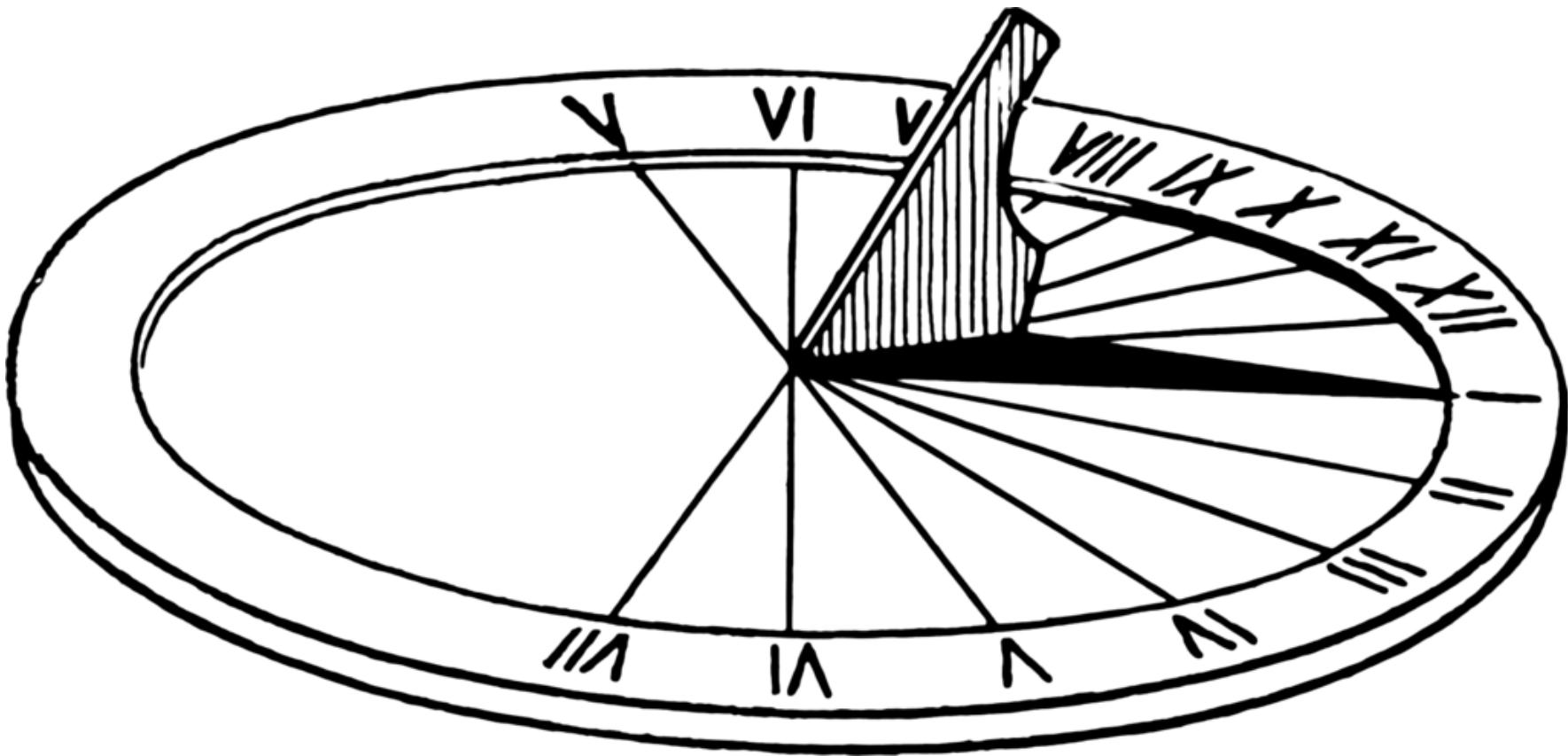
1 500 BC







Vodolazhskaya, Larisa. "Reconstruction of vertical and L-shaped ancient Egyptian sundials and methods for measuring time." *arXiv preprint arXiv:1408.0987* (2014).





ZipRecruiter®

284 days of
sundial uptime
at California

750 BC

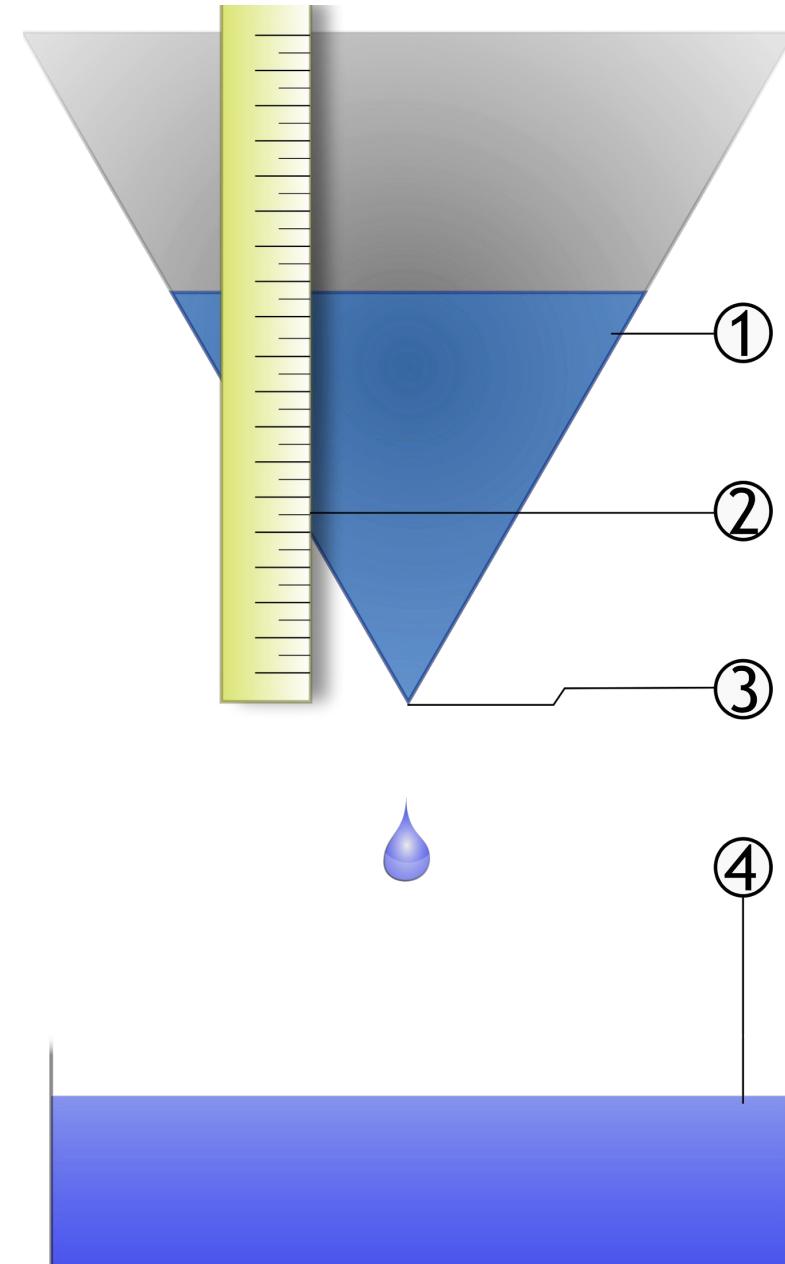
"Calendar of Romulus"

English	Latin	Meaning	Length in days [2][3]
March	Mensis Martius	Month of Mars	31
April	Mensis Aprilis	Uncertain	30
May	Mensis Maius	Uncertain	31
June	Mensis Iunius	Month of Juno	30
Quintilis	Mensis Quintilis Mensis Quinctilis ^[14]	Fifth Month	31
Sextilis	Mensis Sextilis	Sixth Month	30
September	Mensis September	Seventh Month	30
October	Mensis October	Eighth Month	31
November	Mensis November	Ninth Month	30
December	Mensis December	Tenth Month	30
—			(51)

Pre-Julian Roman calendar

English	Latin	Meaning	Length in days <small>[25][26][15][16]</small>
January	Mensis Ianuarius	Month of Janus	29
February	Mensis Februarius	Month of the Februa	28
Mercedonius Intercalary Month	Mercedonius Mensis Intercalaris	Month of Wages	23
March	Mensis Martius	Month of Mars	31
April	Mensis Aprilis	Uncertain	29
May	Mensis Maius	Uncertain	31
June	Mensis Iunius	Month of Juno	29
Quintilis	Mensis Quintilis Mensis Quinctilis ^[14]	Fifth Month	31
Sextilis	Mensis Sextilis	Sixth Month	29
September	Mensis September	Seventh Month	29
October	Mensis October	Eighth Month	31
November	Mensis November	Ninth Month	29
December	Mensis December	Tenth Month	29

300 BC on





Avg temp
above freezing
point year
round
at California



ZipRecruiter®





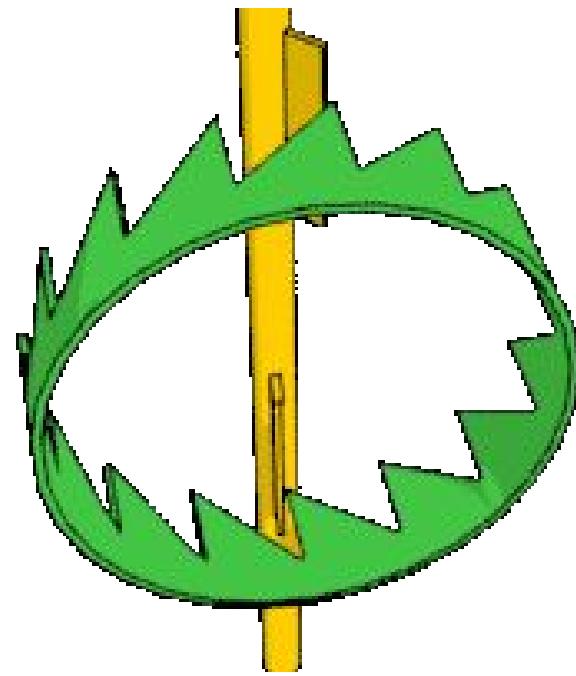
46 BC

Julian Calendar

`$dt->jd()`, `$dt->mjd()`

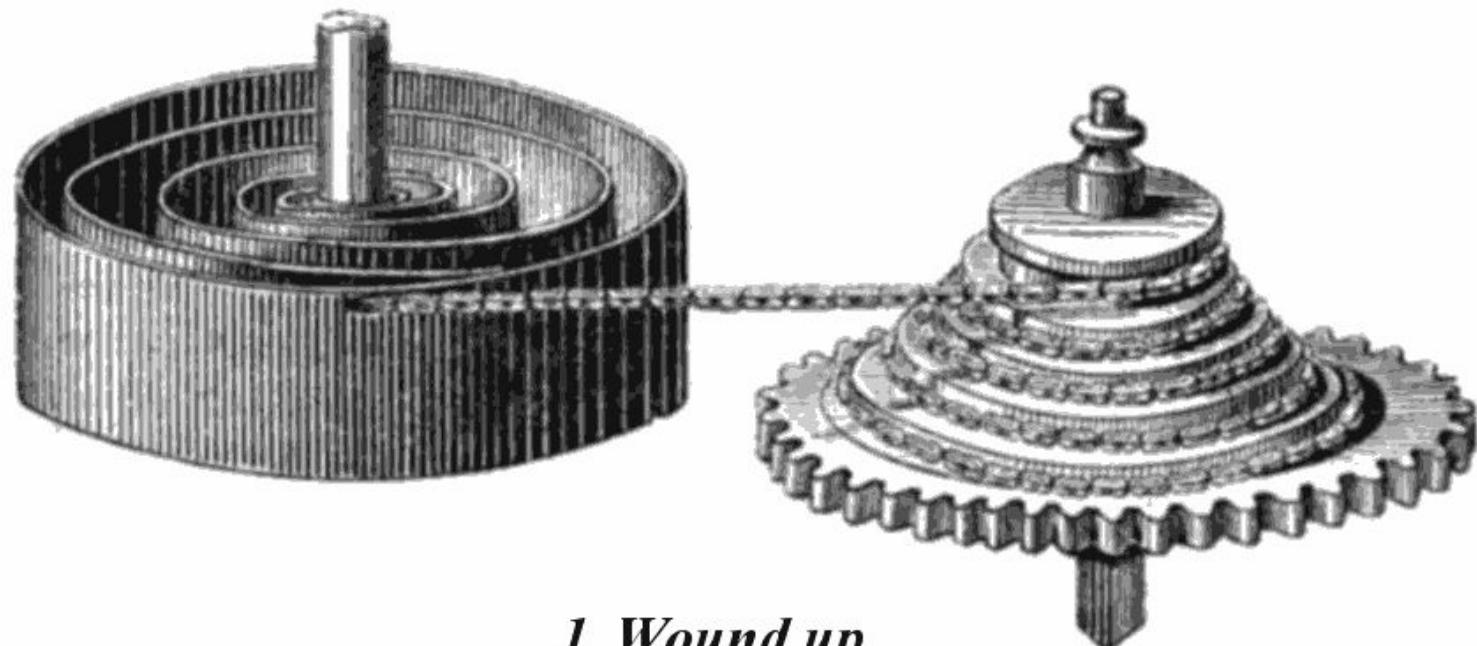
These return the Julian Day and Modified Julian Day, respectively. The value returned is a floating point number. The fractional portion of the number represents the time portion of the datetime.

13th century Mechanical clocks

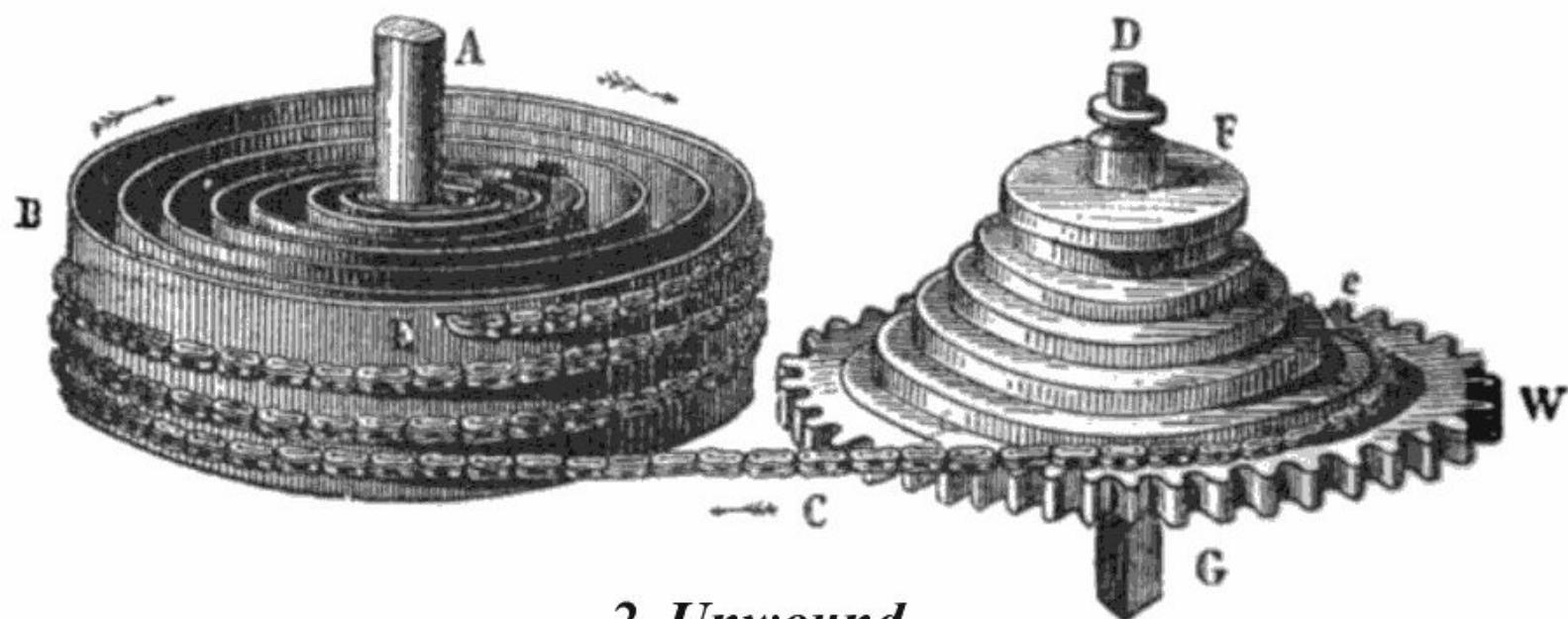




1525
Fusee



1. Wound up

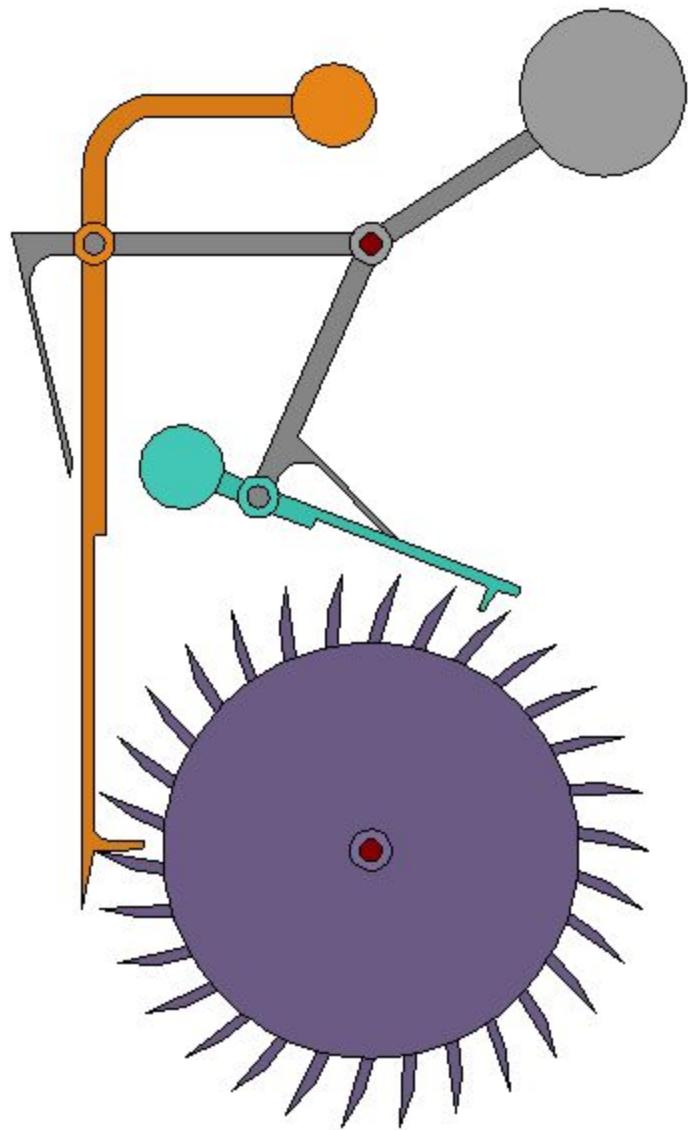


2. Unwound

1582

JULIAN 1582		October			Gregorian 1582	
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

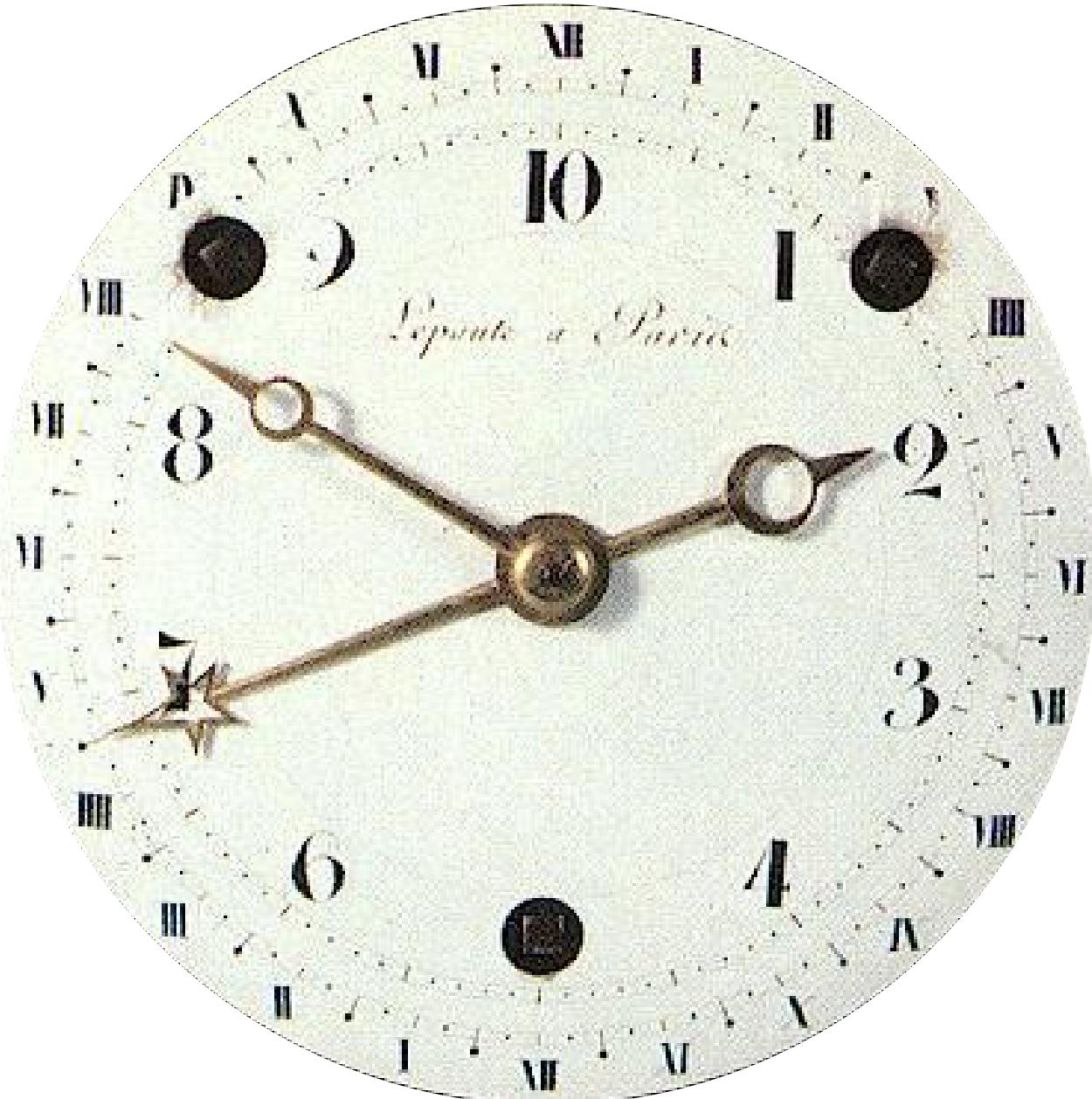
1759
Grasshopper



1784
Royal Mail



1792



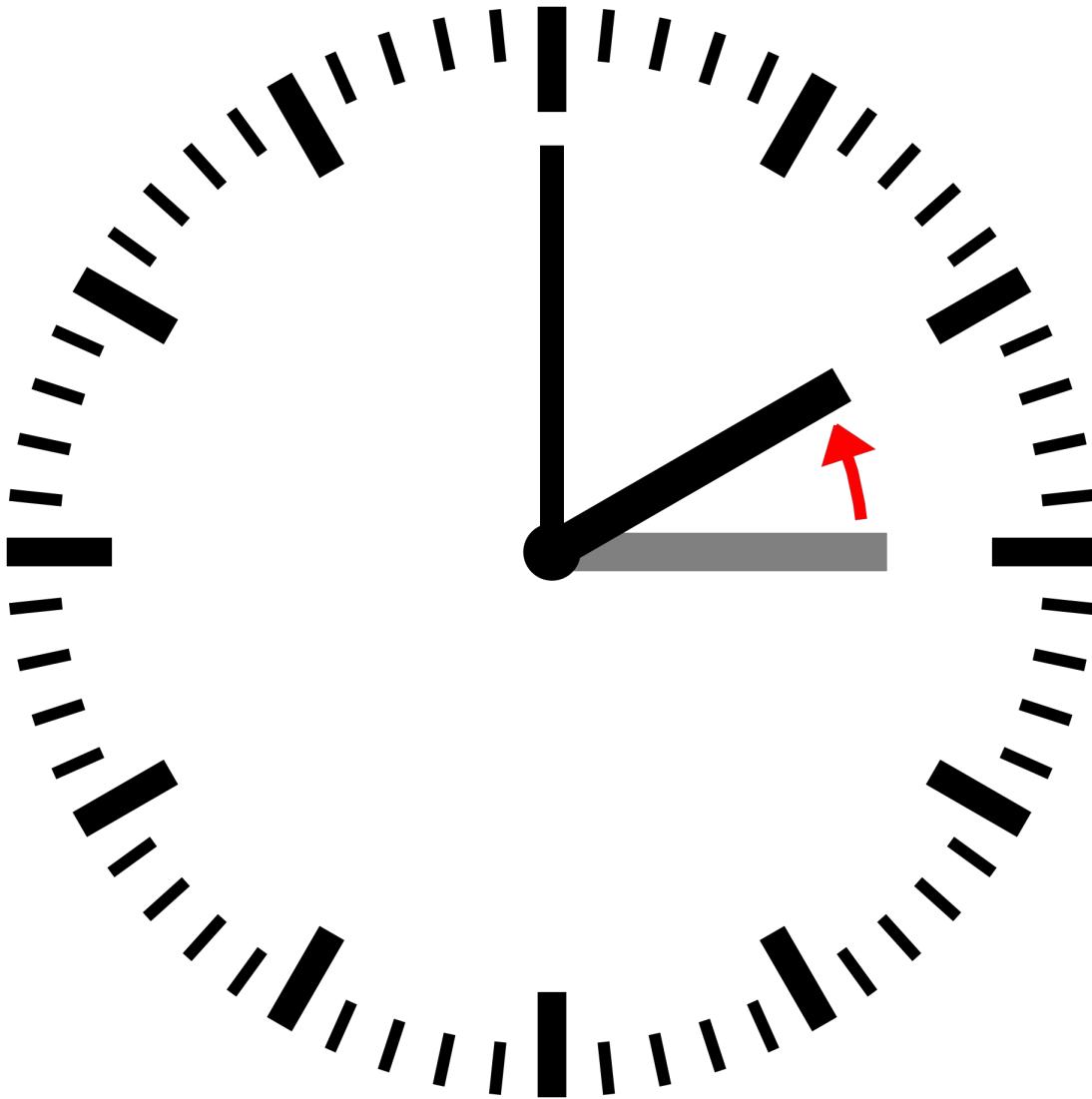
1848
Railroad GMT

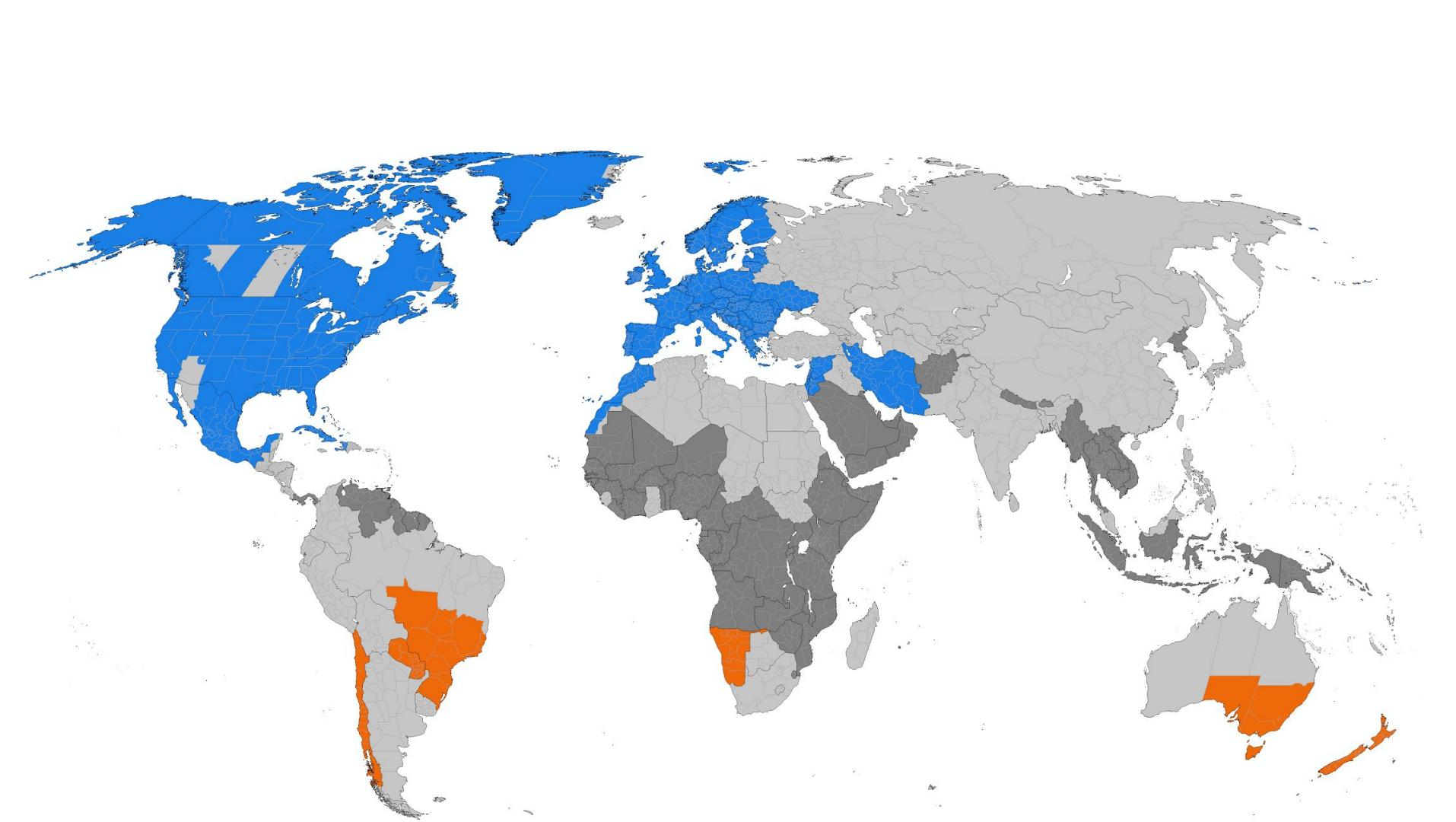
1883
US



1884
Prime Meridian

1908





1927



1949
First Atomic Clock

5061A CESIUM BEAM FREQUENCY STANDARD
HEWLETT • PACKARD

HEWLETT-PACKARD
ASSET NUMBER
5061A



PLANT NO:

002



CESIUM DEVICE
NOT RADIOACTIVE

Agilent
UNCALIBRATED
EQUIPMENT
DO NOT USE

MUSEUM ITEM DO NOT DISPOSE

ALARM



CONTINUOUS OPERATION



5 MHz



1 MHz



100 KHz



1967
Second redefined

1984

[Code](#)[Pull requests 0](#)[Projects 0](#)[Insights ▾](#)

created

SCCS-file: ialloc.c

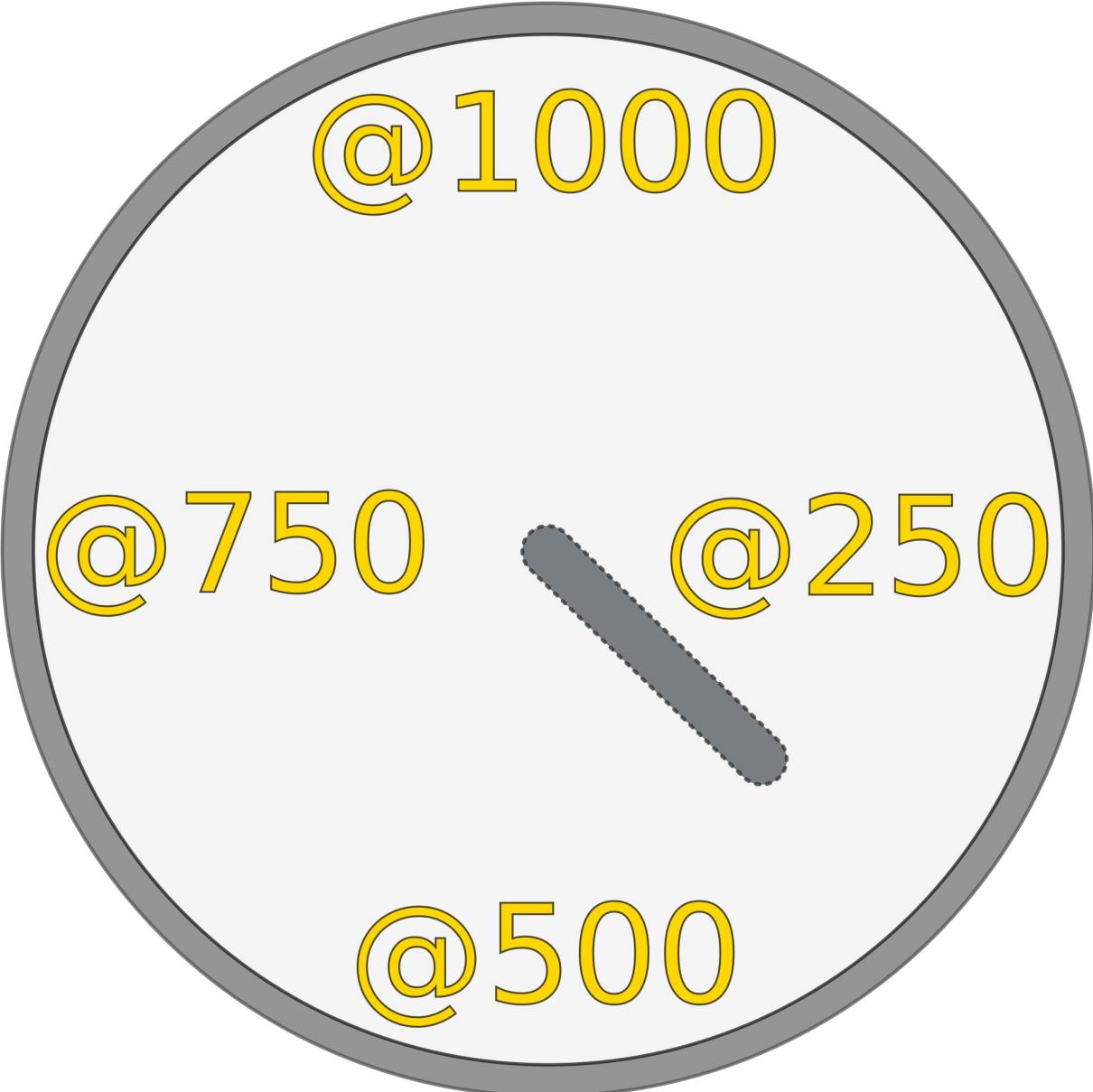
SCCS-SID: 1.1

master → 2017b ... 2012e



Arthur David Olson committed with **eggert** on Feb 21, 1984

1998
Swatch internet time



@1000

@750

@250

@500

Thanks!

Quick reads:

https://en.wikipedia.org/wiki/History_of_calendars
https://en.wikipedia.org/wiki/History_of_timekeeping_devices

Longer reads:



SPRING FORWARD

The Annual Madness of Daylight Saving Time

MICHAEL DOWNING the author of *Shoes Outside the Door*

