Time is Just a Four-Letter Word

Peter Watson

What then is time?

- If no one asks me, I know what it is. If I wish to explain it to him who asks, I do not know.
- St Augustine
- Time is what we don’t have enough of.

I do not define time, space, place, and motion, as being well known to all.

Isaac Newton

Shut up and calculate!

The problem

- Imagine you are a fish...

What do you think about water?

FISH (fly-replete, in depth of June, Dawdling away their wat’ry noon)
Ponder deep wisdom, dark or clear,
Each secret fishy hope or fear.
Fish say, they have their Stream and Pond;
But is there anything Beyond?

But somewhere, beyond Space and Time.
Is wetter water, slimier slime!
...........................................
And in that Heaven of all their wish,
There shall be no more land, say fish.

Rupert Brooke “Heaven”

Water is

- A source of food
- warm and cold
- provides oxygen
- a medium to swim through...

Does a fish think water is wet?
But....
- you couldn't understand pond-skaters (except as food)
- or lakes from the outside
- or steam-engines

We live in Time, like a fish lives in water
- Can we think “outside of time”?  
- How do we think about time?

What do you already know about time?
- What time is it?

Fanning Island: what do you notice?

What do you already know about time?

Biological Age
- Reaction Time
- Balance
- Skin elasticity
- Hair colour
- Wrinkles
- .......
How reliable is Biological Age?


Arsenale in Venice: 2 pics

When were they taken?

- PW (2016)
- Canaletto (1730) Woburn Abbey

The Five Commonest Nouns in English

1. Time
2. Person
3. Year
4. Way
5. Day

Buonomano

e.g.

- Time, lunchtime, bedtime, breakfast time, egg-timer, clock time, start-time, time-out....

Write down another three!
Timing and language

- We also use timing to disambiguate language
- What did I just say?
- Great eyes….Grey ties
- They gave her cat-food…They gave her cat food

Mondegreen

- Lucy in the Sky with Diamonds
- The girl with colitis goes by
- The girl with kaleidoscope eyes

Directionality and Hearing

- What's the picture?

Roughly, we have

- Physical Time
- Psychological Time
- Biological Time
- Sociological Time
- Astronomical Time
- Historical Time
- Geological Time

Are they the same?

Or are they different aspects of the same thing?
When we have understood all the aspects of time, we have understood time. (Carlo Rovelli)

Does time exist in isolation?

What does a clock measure?
What does "prediction" mean?
When did time measurement start?
Do we experience time in the same way?
Why does time pass quicker as we get old?
What defines the direction of time?
Physiological Time: what is a biological clock?
How short a time can we perceive?
What exactly is causality?
Is time travel possible?
If so, why can’t we do it?
If not, what forbids it?
How do we know that two clocks measure the same time?
How are time and space linked?
Is time "smooth"?
Did time begin?
Will it end?

Where are we going?
1. Time and Language: How we talk about time
2. Chronos and Kairos: Literature and Time
3. Time in Film
4. Stonehenge to Caesium: How we Measure Time
5. Biological clocks
6. Time and Philosophy.
7. Bicycle Pumps and Rice Puddings: Time’s Arrow
9. Grouse, Hurricanes and Dead Cats: How to predict
10. Deep Time: How Geology changed time
11. The Beginning and the End.

Time and Culture
Note we will be using “culture” generically

• Literature
• Theatre
• Film
• TV
• Music
• Art

Fiction: short stories
All You Zombies…. (Robert Heinlein)
…and he built a Crooked House (Robert Heinlein)
All Mimsy were the Borogroves (Lewis Padgett)
The Sound of Thunder (Ray Bradbury)
The Garden of Forking Paths, Library of Babel (Jorges Luis Borges)
A Subway Named Mobius (Deutsch)
The Best Time Travel Stories of the 20th Century: Stories by
Arthur C. Clarke, Jack Finney, Joe Haldeman, Ursula K. Le Guin

Fiction: novels
• The Time Machine (H. G Wells)
• Slaughterhouse 5 (Kurt Vonnegut)
• Time’s Arrow (Matin Amis)
• Einstein’s Dreams (Alan Lightman)
• The Time Traveller’s Wife (Audrey Niffenegger)
• Time and Again (Jack Finney)
Movies

• Vertigo (Alfred Hitchcock, 1958)
• Citizen Kane (Orson Welles, 1941)
• Cleo from 5 to 7 (Agnes Varda, 1960)
• La Jetée (Chris Marker, 1962)
• Time Bandits (Terry Gilliam, 1981)
• 12 Monkeys (Terry Gilliam, 1995)
• Timecode (Mike Figgis, 2000)
• Russian Ark (Alexander Sokurov, 2002)
• Sliding Doors
• Back to the Future
• Run, Lola, Run

A Special FREE bonus!

• Marc Furstenau will be giving the second of two talks on Time and Film in my undergrad course.

• “Citizen Kane”, “Vertigo”, “Last Year at Marienbad”, “2001” .....................

• Next Monday (Nov. 12) 5:30 p.m. in ME 3328
• 30 places, so if you want to come, please let me know
• watson@physics.carleton.ca

Non-fiction

• Time Machines (Paul J. Nahin, also with K. S. Thorne)
• Time Travel in Einstein's Universe (J. Richard Gott)
• In Search of Time: The History, Physics, and Philosophy of Time (Dan Falk)
• About Time (Paul Davies)
• Physics of Star Trek (Lawrence Krauss)
• The Labyrinth of Time (Michael Lockwood)
• The End of Time (Julian Barbour)
• From eternity to here: the quest for the ultimate theory of time / Sean Carroll
• Time, space, and metaphysics / Bede Rundle
• Time & the instant: essays in the physics and philosophy of time. (Ed. Robin Durie)
• Gödel/Tipler (use Wikipedia for sources)
• Ford, Roman Scientific American; January 2000, Vol. 282 Issue 1, p.46

TV

• Dr Who; (“Blink” in the David Tennant series)
• Red Dwarf; (esp. Future Echoes, Time Slide, Stasis Leak, Backwards, Dimension Jump)
• Star Trek (some)

and

New from Carlo Rovelli

Recording author of
Seven Brief Lessons on Physics
Plays
Dangerous Corner,
I have Been Here Before,
Time and the Conways
An Inspector Calls (J. B Priestley)
Arcadia
Hapgood (Tom Stoppard)

So how do we talk about Time?