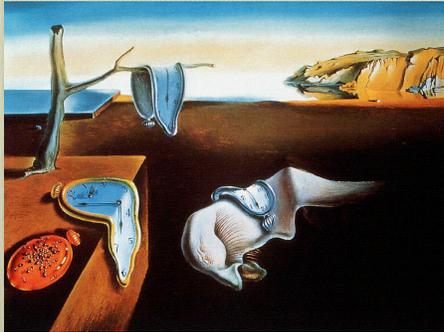


# Time is Just a Four-Letter Word

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.**

(title stolen from Joan Baez)

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. Stonehenge to Caesium: How we Measure Time
3. Bicycle Pumps and Rice Puddings: Time's Arrow
4. Going Straight in a Bent Space: How Matter bends Time
5. Grouse, Hurricanes and Dead Cats: How to predict
6. The Beginning and the End
7. "All You Zombies ...": Time travel, Good Literature and Bad Science

## Time and Culture

Note we will be using "culture" generically

- Literature
- Theatre
- Film
- TV
- Music
- Art

## Sources:

### **Books (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)
- \*\* An Experiment with Time (J. W. Dunne)
- \*\* 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 (edited by Robin Durie)
- \*\* Psychology of Time (Edited Simon Grenadine)
- Physics of Star Trek (L. Krauss)
- The Physics of the Buffyverse (J. Ouellette)
- \*\* The Stuff of Thought : Language as a Window into Human Nature (Steven Pinker)
- \*\* Don't Sleep, There are Snakes (Daniel Everett)

### **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)

The Forever War (Joe Haldeman)

Slaughterhouse 5 (Kurt Vonnegut)

Times Arrow (Matin Amis)

Einstein's Dreams (Alan Lightman)

The Time Traveller's Wife (Audrey Niffenegger)

Time and Again (Jack Finney)

The End of Eternity (Isaac Asimov)

### **Movies**

Sliding Doors

Back to the Future

Run, Lola, Run

Source Code

Primer

The Butterfly Effect

Somewhere in Time (from Time and Again)

Timecop

Kate and Leopold

The Time Machine (several)

A Sound of Thunder (Vaguely related to Bradbury)

Hot-Tub Time Machine

Bill & Ted's Excellent Adventure,

The Last Mimzy (Vaguely related to the Padgett story)

### **Plays**

Dangerous Corner,

I have Been Here Before,

Time and the Conways

An Inspector Calls (J. B Priestley)

Arcadia

Hapgood (Tom Stoppard)

### **TV**

Dr Who; (not many, but try "Blink" in the David Tennant series)

Red Dwarf: (esp. Future Echoes, Time Slide, Stasis Leak, Backwards, Dimension Jump)

Star Trek (some)

Futurama (ugh!)

### **Journal Articles**

\*\*\*Ford,Roman Scientific American; January 2000, Vol. 282

Issue 1, p46

Stanford Encyclopaedia of Philosophy: Time

So how do we talk about Time?