

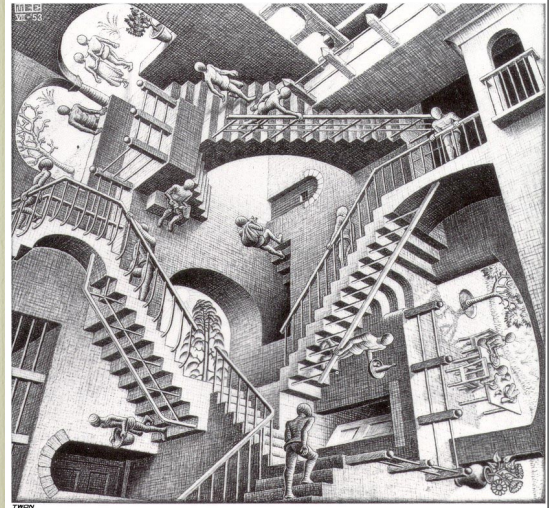
# Time and Language:

How we talk about time

Peter Watson

Time is an Illusion: lunch-time doubly so  
Hitchhiker's Guide

M. C. Escher: "Relativity"



A digression before we start: how do we describe what goes on?  
**The Sapir Whorf hypothesis.** (Very loosely).

The strong form: you cannot discuss a concept unless you have the language to describe it.

- The weak form: your views of the universe are modified and restricted by language.
- A famous wrong example: Eskimos have 56 words for snow
- (they actually have one!).
- However skiers have at least 10:
- (powder, crud, hard-pack, ice, crusty, slush, spring, corn, sugar, fresh, wet, piste, corduroy....).
- Most of these distinctions are meaningless to non-skiers, but they allow a concepts to be transferred in compact form.

## Time in English

- We have a vast array of words linked to time: e.g.

- **Measurement of time:** hour, minute, second, year, epoch, age, period, watch (two meanings), clock,.....
- **Passage of time:** brief, momentary, lengthy, overlong,
- **Temporal ordering, or relative time:** before, after, future, past, history, late, early, first, second, causal, prediction .....
- **Absolute time (usually in phrase) :** 9/11, last Tuesday, Death of Caesar ....
- **Change:** rapid, slow, languorous, flow, dragging,.....
- **Many more that imply time:** paleolithic, oscillatory, periodic, ancestor, descendant, son, speed, acceleration, breakfast, teatime,
- **Note** (very important for later) we already have the idea that things change with time ; e.g.

$$speed = \frac{distance}{time} = \frac{d}{t}$$

### Tenses

but not just words: grammar. In Latin we learned 6 tenses:

Present	<b>Amo, Amas, amat</b>	I love, you (s) love, he she or it loves
Past	<b>amavi</b>	I loved
Future	<b>amabo</b>	I will love
Imperfect	<b>amabam</b>	I used to love/I was loving
Pluperfect	<b>amaveram</b>	I had loved
Future perfect	<b>amavero</b>	I will have loved

- Note that this is grossly simplified: these are Indicative active tenses
- We also have Subjunctive active (amem ⇔ May I love)
- Indicative passive (amor ⇔ I am loved)
- Subjunctive passive (amer ⇔ May I be loved)
- Imperative (ama ⇔ Love! (or else))
- These are "moods", but we are really only interested in the temporal aspects

### Tenses

In Latin we learned 6 tenses: claim in English that we have 10:

Present Simple	<b>I speak</b>	Implies ability to do something in the present
Present continuous	<b>I am speaking</b>	
Present perfect	<b>I have spoken</b>	No particular time implied
Imperfect	<b>I used to speak</b>	I used to love/I was loving
Pluperfect	<b>I had spoken</b>	Implies temporal ordering ("I had spoken before leaving")
Preterite/Aorist	<b>I spoke</b>	
Conditional	<b>I would speak</b>	Can refer to past as well as the future (!)
Past Continuous	<b>I was speaking</b>	
Future	<b>I will speak</b>	Can imply prediction or intention
Future perfect	<b>I will have spoken</b>	Implies series of action in future

Note many subtleties: e.g prediction  
*We will overcome (Negro Spiritual)*  
 vs volition  
*We shall overcome (Peter Seeger's adaptation)*

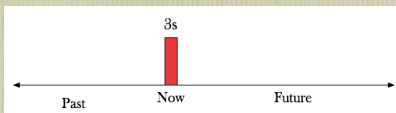
Also note that not all of these translate into even other Indo-European languages e.g

- "I speak" & "I am speaking" ⇒ "je parle"
- "I speak" & "I am speaking" ⇒ "Ich spreche"
- but "I speak" ⇒ "Sto parlando" & "I am speaking" ⇒ "Parlo"
- This does not imply that those languages are incomplete

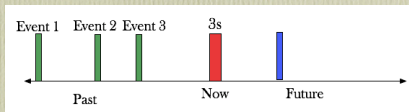
Also note that other languages have other tenses (again from Wikipedia)

- **Near future tense:** in the near future, soon
- **Hodiernal future tense:** sometime today
- **Post-hodiernal future tense:** sometime after today
- **Remote future tense:** in the more distant future
- **Predictive future tense:** a future tense which expresses a prediction rather than an intention, i.e., "I predict he will lose the election, although I want him to win". As such, it is really more of a mood than a tense. **(Its tenseness rather than modality lies in the fact that you can predict the future, but not the past.)**
- **Nonfuture tense:** refers to either the present or the past, but does not clearly specify which. Contrasts with future.
- **Nonpast tense:** refers to either the present or the future, but does not clearly specify which. Contrasts with past.
- **Not-yet tense:** has not happened in present or past (nonfuture), but often with the implication that it is expected to happen in the future. (As such, is both a tense and a modality). In English, it is expressed with "not yet", hence its name.

All of this structure depends on an (unspoken) model of time  
 Simplest model of time: Note 3 s "now" is confirmed by psychology



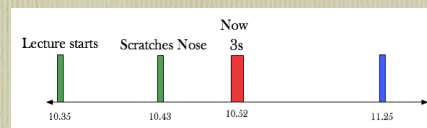
- However we tie down past and future with events.



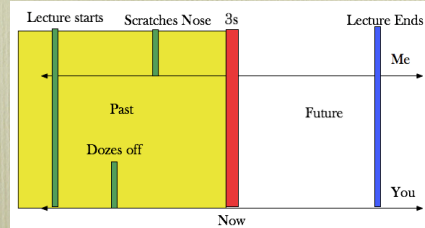
Note "events" are used in physicist's sense: occur at definite time (t) and place (x,y,z)

- The horse-rider's "Three-day event" isn't an event!
- Was the collapse of the World Trade Centre in 9/11 one event or two? (costs you \$3500,000,000 if you have the answer wrong)

Picture is enhanced in several ways:  
 Absolute time (rather than relative)



- Multiple Frames of reference. Note we agree on common events, past and future
- Past is immutable, future is fluid: we'll call this model "linear time"



Past is immutable, future is fluid, but depends on the past: note this is assumed not just in philosophy and physics, but poetry as well

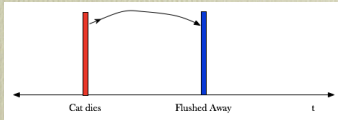
- *The Moving Finger writes; and, having writ,  
 Moves on: nor all thy Piety nor Wit  
 Shall lure it back to cancel half a Line,  
 Nor all thy Tears wash out a Word of it.*  
**Rubaiyat of Omar Khayyam tr. by Edward FitzGerald**
- *Time past and time present  
 Are both perhaps present in time future  
 And time future contained in time past*  
**T. S. Eliot Burnt Norton**
- *And the seasons they go round and round  
 And the painted ponies go up and down  
 We are captive on the carousel of time  
 We can't return we can only look behind from where we came  
 And go round and round and round in the circle game*  
**Joni Mitchell The Circle Game**

## Causality: a meta-rule in science

- i.e. all effects have a cause, which precedes it in time.
- *Wind is caused by trees waving their branches (Ogden Nash, see also G. K. Chesterton)*
- Note this is not a matter of science (!): could a religion deal with an acausal universe?
- Can we even contemplate a universe where a large number of events occur without cause?

## Causality and Language

- Handled by standard constructions
- *The cat died so I flushed it down the toilet*
- *Because the cat was dead, I flushed it down the toilet*
- Note implied sequence of events



- But note we have constructions that violate causality
- *I went to the supermarket yesterday because I have to go to the dentist tomorrow*
- Will need a more precise way to define causality

## Free-will/Determinism

- in the Sapir-Whorf context, English is biased in favour of free-will: e.g.
- “I decided to go to the movie tomorrow”
- “I decided not to go to the movie tomorrow”
- Both sound sensible, but
- “It is predetermined that I will go to the movie tomorrow” sounds stupid

Are there any temporal concepts that we **cannot** express in English?

Note that we can easily understand temporal concepts we have never discussed before. E.g. Red Dwarf



## Do we need all these tenses?

Damon Runyon:

- “More than Somewhat” (two stories make up the musical “Guys and Dolls”)
- “Furthermore”
- “Take It Easy”
- collected in “Runyon on Broadway”
- One use of past tense in 800 pages (in “The Lily of St Pierre”)

## Dancing Dan's Christmas

Now one time it comes on Christmas, and in fact it is the evening before Christmas, and I am in Good Time Charley Bernstein's little speakeasy in West Forty-seventh Street, wishing Charley a Merry Christmas and having a few hot Tom and Jerrys with him.

This hot Tom and Jerry is an old time drink that is once used by one and all in this country to celebrate Christmas with, and in fact it is once so popular that many people think Christmas is invented only to furnish an excuse for hot Tom and Jerry, although of course this is by no means true.

But anybody will tell you that there is nothing that brings out the true holiday spirit like hot Tom and Jerry, and I hear that since Tom and Jerry goes out of style in the United States, the holiday spirit is never quite the same.

The reason hot Tom and Jerry goes out of style is because it is necessary to use rum and one thing and another in making Tom and Jerry, and naturally when rum becomes illegal in this country Tom and Jerry is also against the law, because rum is something that is very hard to get around town these days.

For a while some people try making Tom and Jerry without putting rum in it, but somehow it never has the same old holiday spirit, so nearly everybody finally gives up in disgust, and this is not surprising, as making Tom and Jerry is by no means child's play. In fact, it takes quite an expert to make good Tom and Jerry, and in the days when it is not illegal a good hot Tom and Jerry maker commands good wages and many friends.

Now of course Good Time Charley and I are not using rum in the Tom and Jerry we are making, as we do not wish to do anything illegal. What we are using is rye whisky that Good Time Charley gets on a doctor's prescription from a drug store, as we are personally drinking this hot Tom and Jerry and naturally we are not foolish enough to use any of Good Time Charley's own rye in it.

## Non-European Languages

- Have found their own way to handle time
- e.g. Eastern Languages (thank you Cho & Marcus Watson)
- Japanese; no tenses, but concepts conveyed by adverbs
- "I speak futurely"
- "I speak pastly"

Chinese works with "particle" words: no exact equivalence in English:

I eat.	我吃饭
I am eating	我正在吃饭 ---"正在" presents "ing"
I have eaten/I ate	我吃过饭了 ---"过"and"了" present past tense
I was eating	我正在吃饭
I had eaten	我吃过饭了
I will eat	我将会吃饭 "将会" presents future tense
I will be eating	我将会正在吃饭
I will have eaten	我将会吃过饭了

昨天下午1点, 我去看他时, 他正好吃过午饭。

Yesterday afternoon at 1pm, when I went to visit him, he had eaten his lunch.

今天下午1点, 我去看他时, 他正好吃过午饭。

This afternoon at 1pm, when I went to visit him, he had eaten his lunch.

明天下午1点, 我去看他时, 他正好吃过午饭。

Tomorrow afternoon at 1pm, when I go to visit him, he will have eaten his lunch.

Note that sentences are identical except for particles

No tenses in European sense

- The simplest form of English is pidgin: e.g. in Northern Nigeria, just 3 tenses:

• **Present:** I eat bread = I am eating the bread

• **Future:** I go eat bread = I will eat the bread

• **Past:** I done eat bread = I ate the bread

- Note this leads to oddities such as "I go come" and "I done come"!

- Oral cultures tend to have relative time but not absolute time.

- Whorf claimed that the Hopi have no word for "time" or "past, present or future", (apparently true)

- and hence had no concept of time (certainly false, since they have a calendar and understand crop planting etc.

## The Pirahã:

- an extraordinary example: the Pirahã: language has
  - 1.No words for colour
  - 2.No words for number
  - 3.No creation myths
  - 4.No words for ancestors
- Even taught the Portuguese words for numbers, "not one of them had learned to count to 10 or even to add 1 and 1" *New Scientist, March 18th 2006*
- Some concepts they use do not exist in English: e.g. xibipio = "appear" and "disappear".
- and apparently no concept of time in the Western sense.
- see Daniel Everett, "Don't Sleep, There are Snakes"

## Time in Literature

Aristotle demanded the three unities

- Unity of Space
- Unity of Time
- Unity of Action

- The first two are, of course, just physics. Almost all writers assumes an underlying 3-D space and time which flows in a linear fashion.

- Changing these totally destroys the story!
- e.g. The prisoner in the "Count of Monte Cristo" cannot escape his three-dimensional cell: trivial to do so in a four-dimensional world it becomes quite like a child playing hop-scotch can step out of a square in two-dimensions
- What stories really satisfy the three unities?
- "High Noon"
- "Rope" (Hitchcock's retelling of the Leopold-Loeb case).

## Time in Literature

•compression of time: Philip Sydney grumbled about this 400 years ago:

•"Now of time they are much more liberal; for ordinary it is, that two young princes fall in love; after many traverses she is got with child; delivered of a fair boy; he is lost, groweth a man, falleth in love, and is ready to get another child; and all this in two hours' space; which, how absurd it is in sense, even sense may imagine;" Philip Sidney

•flashback: the insertion of a little bit of past time into present time. In practice, a character relating what has happened to him in the past is almost the same author dropping the story back into the past.

•Either way the past is fixed two or more threads of a story sequentially, this 3-dimensional space and a linear time represent the physics framework of the vast majority of stories.

•e.g. "Oliver Twist" : space is England and the time Victorian, but the 3 dimensions of the space fail to be mentioned.

**Chapter 1: Treats of the place where Oliver Twist was born, and of the circumstances attending his birth.**

Among other public buildings in a certain town, which for many reasons it will be prudent to refrain from mentioning, and to which I will assign no fictitious name, there is one anciently common to most towns, great or small: to wit, a workhouse; and in this workhouse was born; on a day and date which I need not trouble myself to repeat, inasmuch as it can be of no possible consequence to the reader, in this stage of the business at all events; the item of mortality whose name is prefixed to the head of this chapter.

So what was the first story in which Time was used in a non-trivial way

- Oedipus?
- Christmas Carol?
- Time Machine?

## Final thoughts on Time and Language

- More advanced the language, more sophisticated the description of time.
- **Can we argue that language developed to explain our relationship with time?**
- Are there time-related concepts that we **cannot** describe in English?
- **Yes:** will show examples later on
- In physics, we need to describe concepts which *don't* map well on to the English language, and don't necessarily have translations. e.g. "mass" and "weight" are almost synonymous in English and many languages have the same word. They also carry cultural baggage. Further, we have concepts which have no correct mapping e.g. "electron".
- Maths represents a (more-or-less) culture-free way of describing concepts. Also it allows predictions in a quantitative way.
- **No human investigation can be called real science if it cannot be demonstrated mathematically** [Leonardo da Vinci](#)
- So how do we measure time