

Possible Worlds



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THE UNIVERSITY OF
WAIKATO
Te Whare Hāngai o Hīkato

Day 1

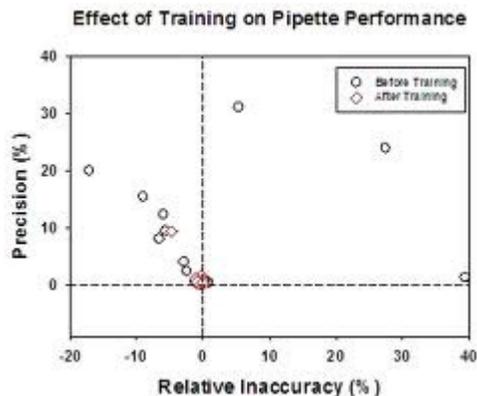
TOPICS

- *Why Study Philosophy?*
- *What is Metaphysics?*
- *Defining Time*
- *Defining Possibility*
 - ❖ *Logical possibility / necessity*
 - ❖ *Physical possibility / necessity*
 - ❖ *Epistemic possibility / necessity*

Day 1

Why Study Philosophy?
What is Metaphysics?
Defining Time
Defining Possibility

- Many of you guys are aspiring to be... **researchers**
- Really great research requires training in... **precise, accurate, rigorous thought**
- Really great research also requires training in... **speculative, creative, imaginative thought**
- This course is designed to uniquely foster the second kind of thinking, whilst not neglecting the first



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Our Tools:

- **Good ideas** from smart philosophers throughout history
- **Formal logic** (there will be a series of 'logic links' through the course, with some exercises to do if interested)
- **Thought experiments** (a.k.a. **Possible worlds**)
- **Class discussions**
- **Open-ended questions.** Some people, particularly those trained in exacting detail-oriented thinking, can find that large open-ended questions make them feel very uncomfortable. If this applies to you, it's ok, it's natural. Just don't panic!

Bertrand Russell: philosophy "keeps alive our sense of wonder by showing familiar things in an unfamiliar aspect".

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“But isn’t philosophy just a bunch of unanswerable questions?”

Answer taken from: <http://www.uri.edu/personal/szunjc/philos/whystudy.htm>

- The inability of philosophy to produce positive and applicable knowledge gives rise to the view that it is a "useless" pursuit. In comparison with other fields of human knowledge, particularly applied sciences, philosophy really seems to be deprived of any practical value and effectiveness.
- This is generally regarded as its most serious defect, especially nowadays when everybody values usefulness and effectiveness.
- **Einstein:** "People like chopping wood, because it shows immediate results."



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Here is an argument:

For 2000 years philosophers have inquired into philosophical questions and not agreed on their answers. **PREMISE 1**

If people inquire long and diligently into questions but don't agree on their answers, then those questions must have no clear answers. **PREMISE 2**

Questions which have no clear answers are pointless to inquire into. **PREMISE 3**

Therefore it is pointless to inquire into philosophical questions. **CONCLUSION**

Question: Is this a good argument? Why or why not?

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- Metaphysics is one of the most fundamental areas of philosophy. It deals with what 'is' – in the most fundamental sense. We can say that it is the science of *being*.

What kinds of questions could we ask about *being*?

- Here are two really fundamental ones:
 - 1) **What is the Universe made of**, at the most general level?
Times? Spaces? Persons? Events? Physical Objects? Causes?
Ideas?
 - 2) **What kinds of relationships** do those entities have?

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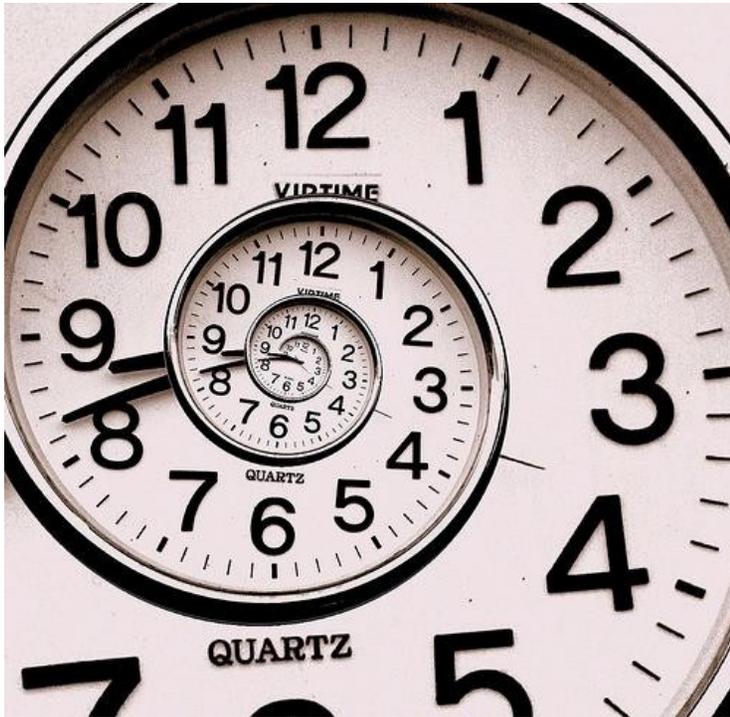
The vexed issue of naturalism

- Some people (including some philosophers) believe that, these days, answering the questions on the last slide should be left to *natural science*.
- However, others (including many other philosophers) believe that underneath the specific questions answered by the natural sciences via experiment and scientific theory, lie other, deeper questions which can only be answered by using *reason and imagination* (in other words, speculative thought).
- This will be our approach.

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Time has always been one of the most mysterious and fascinating metaphysical topics



Exercise: Defining time *(groups of ~3)*

1) Write a definition of time (!). What kind of 'thing' is it? (N.B.: make sure the definition you come up with would not equally apply to *space*! Because if so, you haven't really defined *time*, have you? 😊)

2) What is it that makes now (i.e. the present moment) now?

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**What St Augustine
(famously) said about time:**



“What then is time? If no one asks me, I know: if I wish to explain it to one that asks, I know not.” *Confessions*, 11.14.17

...or, in other words...

I always used the concept before with no trouble, but now I try to define it, I find I can't – WTH?

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The word 'possible' has been found by philosophers to have more than one meaning. We begin with:

Logical Possibility

To say that p (i.e. some proposition) represents a situation which is logically possible, is to say that p **contains no logical contradiction**. Logical contradictions may be very obvious: e.g.:

P1: Paris is the capital of France and Paris is not the capital of France."

Logic link: Logical structure P1: **($p \ \& \ \sim p$)**

Or contradictions may be not so obvious, e.g.:

P2: No kittens are black and Fluffy is black and Fluffy is a kitten.

Logic link: Represent P2 in formal logic

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A philosopher who is trained in formal logic can sometimes do useful work in pointing out logical contradictions that are not immediately obvious.

Sometimes, in order to expose the logical contradiction, you need to make explicit the *meanings* of some of the words in the propositions. E.g. the following represents a situation which is not logically possible:

P3: Trista is a bachelorette and Trista is married.

Logic link: represent P3 in formal logic

The *logical structure* here does not seem to be contradictory. But it is part of the *meaning* of 'bachelorette' that the person isn't married. We could add to our logical system a rule which exposes the contradiction, if we wanted. (*How?*)

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Exercise: Do the following propositions represent logically possible situations?

- i) Wellington is the capital of New Zealand.*
- ii) Auckland is the capital of New Zealand.*
- iii) Pigs fly.*
- iv) At exactly 3 p.m. on 4th March 2003, Bob was in Hamilton and at exactly 3 p.m. 14th March 2003, Bob was in Shanghai.*
- v) At exactly 3 p.m. on 4th March 2003, Bob was in Hamilton and Bob was in Shanghai.*
- vi) [hard] Water is not H₂O.*
- vii) [hard] Parallel lines meet each other.*

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Physical Possibility

To say that p (i.e. some proposition) represents a situation which is physically possible, is to say that p is **consistent with the laws of nature**.

Thus, the following is physically possible:

P4: Cathy drops a pen under normal conditions and it falls to the floor.

The following is not physically possible:

P5: Cathy drops a pen under normal conditions and it flies up to the ceiling.

P5 is inconsistent with **Newton's 2nd law of gravity**.

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So a proposition can describe a situation that is logically possible (because it contains no internal logical contradiction) but is physically impossible (because it is inconsistent with a law of nature). E.g.:

P6: Mel Gibson jumps out of a tenth story window, lands on the ground, and is uninjured.

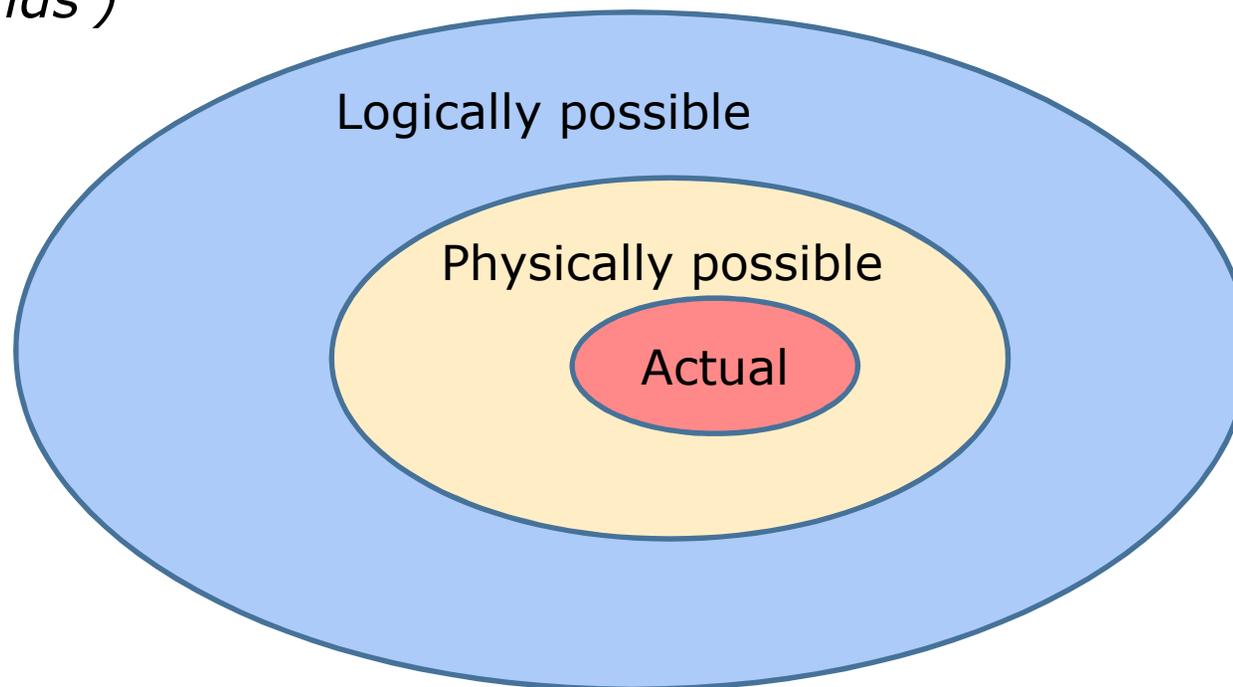
P7: Mel Gibson holds a piece of iron in his hand and it turns to gold.

Question: *Does the reverse hold? Is it possible for a proposition to describe a situation that is physically possible but logically impossible?*

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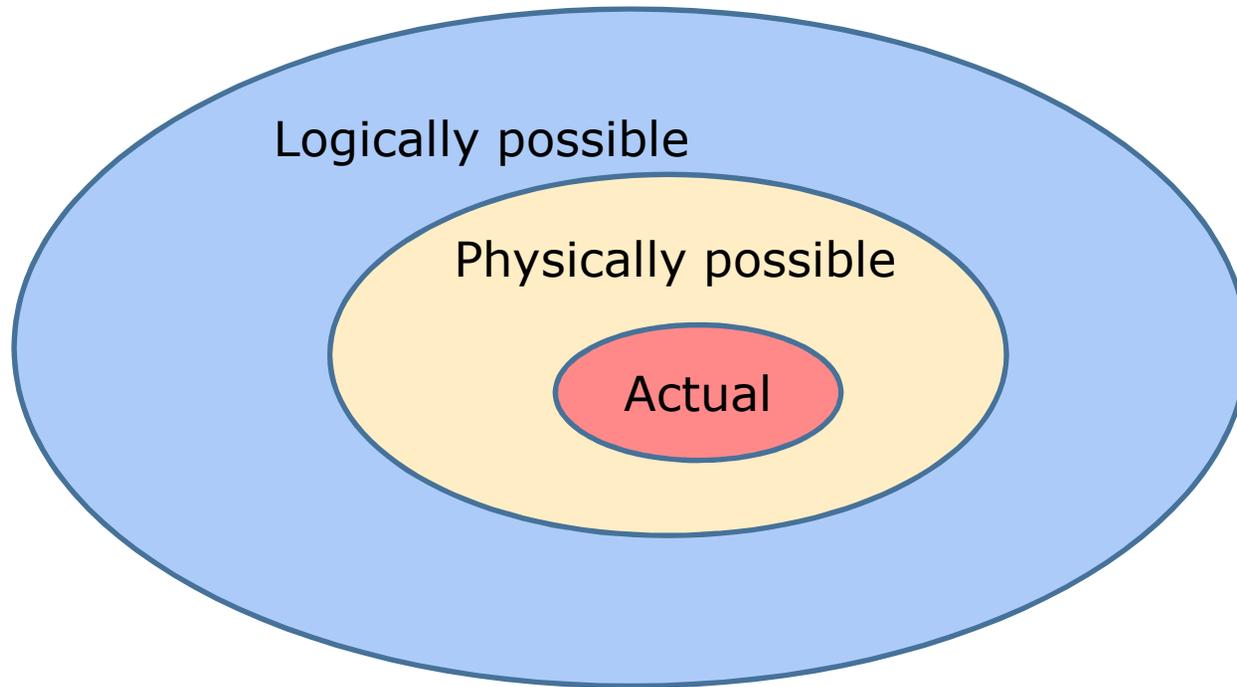
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Answer: No. Here is the reason (consider the ovals as 'sets of possible worlds')



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I am **not a trained physicist**, so I cannot tell you much about what is physically possible. *However*, this diagram shows the role which **philosophy** can have nonetheless in clarifying what is possible. *If something is **not logically possible** then we know that it is **not physically possible**.*

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Exercise: Do the following propositions represent situations that are logically possible and physically possible, logically possible and physically impossible, or logically impossible? (Think carefully...)

- i) Henry VIII had 3 sons*
- ii) Henry VIII's oldest child was a son and Henry VIII's oldest child was a daughter.*
- iii) The moon is made of green cheese*

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Epistemic Possibility

- Whereas physical possibility consists in consistency with the *laws of nature*, to say that p is epistemically possible is to say that it is **consistent with what we know**.

- Hopefully it should be obvious why we need a distinction between physical and epistemic possibility (*Why?*)

- Thus the following are physically possible but in the 19th century were not epistemically possible (at least in Western society):

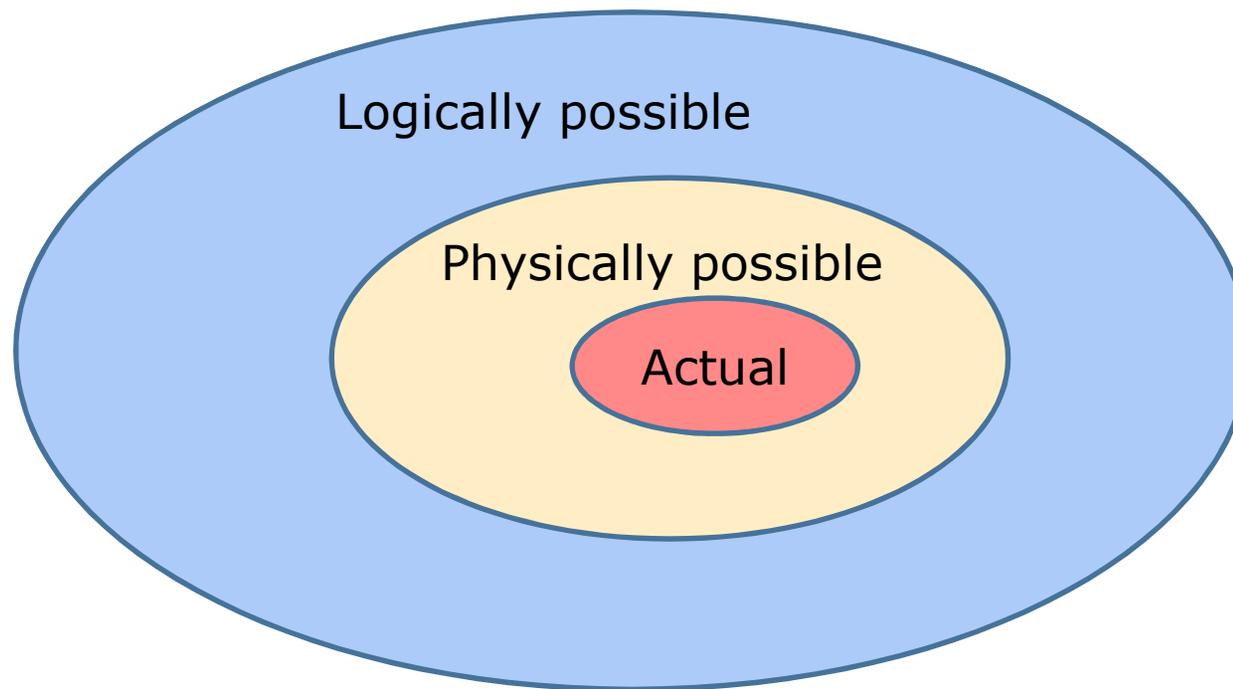
P8: Ships can be built out of metal.

P9: Matter can disappear altogether.

Question: *Can you think of any more examples of epistemic impossibilities (for us)? Can you think of an example of something which is physically possible but epistemically impossible?*

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Question: *Where should epistemic possibility be drawn on this model?*

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Exercise: Logically possible/impossible, physically possible/ impossible, epistemically possible/impossible? (And why?)

- i) A cat flies to the moon without a spaceship*
- ii) The youngest child cooks for everyone in the family.*
- iii) The youngest child cooks for everyone in the family who doesn't cook for themselves*

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Kinds of Necessity

Each of the varieties of possibility outlined above has its own corresponding version of necessity:

p is logically possible: according to the laws of logic it might be true.

p is logically necessary: according to the laws of logic it must be true.

p is physically possible: according to laws of nature it might be true.

p is physically necessary: according to laws of nature it must be true.

p is epistemically possible: according to our knowledge it might be true.

p is epistemically necessary: according to our knowledge it must be true.

There is a more general term which covers all the concepts of possibility and necessity outlined above: '**modality**'. Modality is a rich area of study within philosophy (especially metaphysics and epistemology).

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Logic Link: Modality is also a rich area of study in formal logic. **Quantified Modal Logic** provides a structured way of thinking through issues to do with possible worlds, and even doing proofs involving different possible worlds.

Key Idea:

Unify the necessity operator: \Box with the universal quantifier: \forall

Unify the possibility operator: \Diamond with the existential quantifier: \exists

Thus:

It's necessarily true that all cats are grey \rightarrow

In all possible worlds all cats are grey

It's possible that some cats are grey \rightarrow

There is at least one possible world where at least one cat is grey.

However the relationship between the different 'flavours' of modality (the **logical**, **physical**, **epistemic** which we have touched on, and others such as **deontic**) is very much an open frontier in logical research.

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Philosophical Homework for Tomorrow:

Read these stories:

Ray Bradbury, "A Sound of Thunder":

http://www.onebee.com/writing/2005/07/sound_of_thunder

Robert Heinlein, "By His Bootstraps":

<http://www.xs4all.nl/~pot/scifi/byhisbootstraps.pdf>

Decide whether they are:

logically possible/impossible

physically possible/impossible

epistemically possible/impossible.

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FURTHER READING:

Philosophy:

Susan Schneider (ed), *Science Fiction and Philosophy* (Wiley-Blackwell, 2009). [**Introduction good on “science fiction as a window into philosophical puzzles”. Goes on to provide great story-philosophy links.**]

Bertrand Russell, “The Value of Philosophy”,
<http://www.skepdic.com/russell.html>

Michael Loux, “Introduction”, *The Possible and the Actual* (Cornell, 1997). [**Lays out the possible worlds approach to metaphysics in detail, however pretty ‘chewy’**]

Logic:

James Garson, “Modal Logic”, *Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/logic-modal/>

Rod Girle, *Modal Logics and Philosophy* (McGill-Queens, 2000)
[**extremely clear and well put-together**]