Identity and change

Overview

- Introduction
- Two kinds of identity
- Kinds of change
  - change of composition
  - ship-of-Theseus-problem
- Qualitative change and temporal parts
- Conclusions/summary
- A Survey of Metaphysics, E. J. Lowe, part 1

Identity

- Intuition:
  - Everything is identical with itself and with no other thing
- Leibniz's law:
  - Whatever is true of a thing is true of everything identical with it
- Consequence:
  - If two things differ in at least one properties then they cannot be identical

Things do change

… and yet remain the same.

Conflict with intuitive notion of identity

- Leibniz's law:
  - Whatever is true of a thing is true of everything identical with it
- Consequence:
  - If two things differ in at least one properties then they cannot be identical

Two kinds of identity

Numerical identity

The persons in the pictures are **numerically** identical

Change of quality (1)

40 kg   70 kg   90 kg

Change of quality (2)

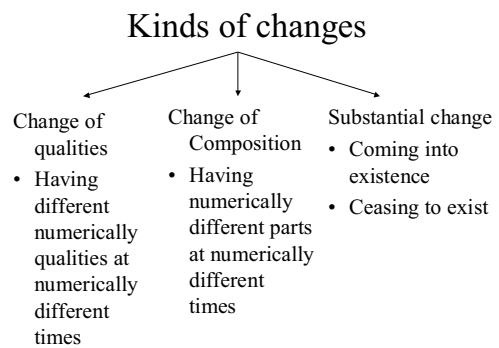3 feet tall   7 feet tall   6.5 feet tall

Two kinds of identity

- Numerical identity
  - Identity of things
  - Bill Clinton (BC) remains the same thing
  - BC is numerically identical to himself

- Qualitative identity
  - Identity of the qualities of a thing
  - Having the weight of 90 kg in the morning and 90 kg in the evening
  - BC's weight of 90 kg and Al Gore's weight of 90kg

- Numerically identical things can have numerically different qualities at numerically different times
- Numerically distinct things can have numerically identical qualities at the same time

Kinds of changes

Kinds of changes

Change of qualities
- Having different numerically qualities at numerically different times

Change of Composition
- Having numerically different parts at numerically different times

Substantial change
- Coming into existence
- Ceasing to exist

Change of composition:
The ship-of-Theseus problem

- Ship A = Theseus' original ship
- Ship B = The ship Theseus returns in
- Ship C = The ship that is built from the original parts that Theseus threw overboard
- Which of these ships is *identical to* the original ship?

  1. Ship A = Ship B (and not C)
  2. Ship A = Ship C (and not B)
  3. Ship A = **Both** Ship B and C.
  4. Ship A = **Neither** Ship B or C

Ship A = Ship C (and not B)

- A and C are identical since they consist of the same parts
- A and B are distinct since they consists of different parts
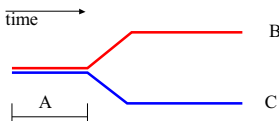

Ship A = Ship B (and not C)

- A survives repeated small changes of its compositional structure

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Ship A = **Both** Ship B and C

- B = A and A = C $\Rightarrow$ B = C
- The same ship is at the same time at two different places

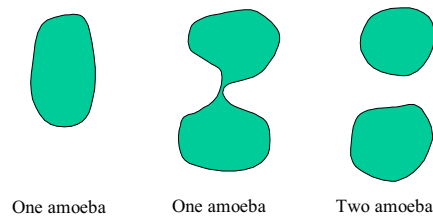## Ship A = **Neither** Ship B or C

- Both B and C existed before and, in fact A is not one ship but two coincident ships

- Problem: one always needs to take into account past and future

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Substantial change

- Coming into existence or chasing to exist

One amoeba   One amoeba   Two amoeba

Qualitative change and temporal parts
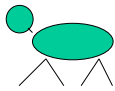

Identity

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Identity and change of composition: Tibbles vs. Tib + Tail
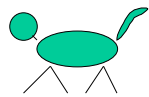
Tibbles = Tib + Tail t_1

Tibbles = Tib   ??? t_2

Given Leibniz's law:
How can Tibbles and Tib be numerically identical ?

Temporal reading of Leibniz's law

- Tibbles has a tail **at t_1**
- Tibbles does not have a tail **at t_2**

- How does reference to time make qualitative change more intelligible?

Temporal reading of Leibniz's law

- Leibniz's law (atemporal version)
  - $a = b \equiv$ for all F: *a is F* iff *b is F*
  - Tibbles = Tib + Tail *and* Tibbles = Tib
- Leibniz's law (temporal version)
  - $a = b \equiv$ for all F and t: *a is F at t* iff *b is F at t*
- '***a is F at t***' instead of '*a is F*'
  - Tibbles = Tib + Tail   *today*
  - Tibbles = Tib   *tomorrow*

Different interpretations of

'*a is F at t*'

result in different solutions

Presentism (1)

- Only those things which exist at the present moment – *now* – exist at all
- The only qualities these things really possess are the qualities they possess now
- Only those statements ascribing qualities to objects are (strictly) true that ascribe those qualities to objects that exist now.

Presentism (2)

- The only strictly true statements of the form '*a is F at t*' are of the form '*a is F now*'
- It is strictly never true that the same object posses mutually incompatible qualities at different times, since the only real time is the present

Problems with presentism

- How to make sense of everyday talk about past and future things?
- Modal treatment of past and future
  – Talk about past and future is talk about what would be the case if a certain past or future time were present.
  – E.g., if it were 30 years ago from now then BC would have a weight of 70kg.

Problems with presentism (2)

- Solution to the problem of change is just denying that it exists at all
- Significant departure from the common-sense of thinking

Solutions of temporal realism

- Take time seriously
- Explicit reference to time
  – Time-indexed predicates: *a* is **F-at-t**
  – Time-indexed objects: **a-at-t** is *F*
  – Temporally modified predication: *a* **is-at-t** *F*

Time-indexed predicates

- Builds the time referred to, *t*, into what is predicated of the object *a*
- What is predicated of the object *a* is not simply a quality of F-ness, but rather the **relational property** of being *F-at-t*

Relational properties

- Properties which things posses in virtue of being related to other things
  - *Brother-of-someone(a)* iff *a* is the sun of parents with two children
  - *greenness-today(a)* iff *a* is green today
  - redness-yesterday
  - 70-kg-weightness-30-years-ago

Solution to the problem of qualitative change

- Compatible relational properties
  - 40-kg-weight-40-years-ago(BC)
  - 70-kg-weight-30-years-ago(BC)
  - 90-kg-weight-now(BC)
- Incompatible properties
  - 90-kg-weight-now(BC)
  - 40-kg-weight-now(BC)

Solution to the problem of qualitative change

- There is no change only lots of compatible relational properties
- Denial that qualitative change occurs
- Objects do not possess changing intrinsic (non-relatioal) qualities
- Objects possess only non-changing relational qualities

Problems

- It is counter-intuitive to deny the existence of change
- There must be non-relational, intrinsic properties
  - Relations need to hold between objects
  - How can there be objects without intrinsic (non-relational) properties?
- What are intrinsic non-changing properties?

Solutions of temporal realism

- Take time seriously
- Explicit reference to time
  - Time-indexed predicates: *a* is *F-at-t*
  - Time-indexed objects: *a-at-t* is *F*
  - Temporally modified predication: *a* **is-at-t** *F*

Temporal parts

- Builds the reference to time into the object
- 'a is F at t' is interpreted as '*a-at-t* is *F*'
- The subject *a-at-t* of '*a-at-t* is *F*' refers to a **temporal part** of *a* that exists at *t* rather than to the whole *a* itself.
- BC-at-the-age-of-10 had a weight or 40kg
- BC-as-president had a weight of 90kg

Solution to the problem of qualitative change

- Incompatible qualities are not ascribed to an object but to numerically different temporal parts of this object.

Bill Clinton's life

40 kg   70 kg   90 kg

Temporal parts and relational properties

- Wholes possess multiple relational properties
- properties with respect to the temporal part-whole structure rather that with respect to time directly
  - 40-kg-during-the-40kg-period-of-his-life(BC)
  - 70-kg-during-the-70kg-period-of-his-life (BC)
 - 90-kg-during-the-90kg-period-of-his-life (BC)

Perduring entities as sums of temporal parts

- Two enduring entities are numerically identical if and only if they have the same temporal parts

Ship A

Ship B
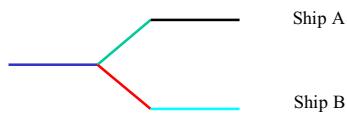
Problems

- What is a temporal part?
- No temporal change:
  - Distinct temporal parts of a whole posses with distinct properties
  - The whole does not change
  - The parts themselves do not change either
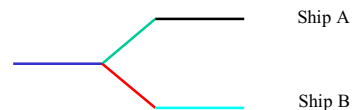
Ship A

Ship B

Solutions of temporal realism

- Take time seriously
- Explicit reference to time
  - Time-indexed predicates: *a* is *F-at-t*
  - Time-indexed objects: *a-at-t* is *F*
  - Temporally modified predication: *a* **is-at-t** *F*

Adverbial solution

- Reference to time
  - Not into the predicate
  - Not into the object
  - But into process of predication as a **predicate modifier**
- *a* **is-at-t** *F*

Qualities and their possession

- Quality can be ascribed to an object (which exists in time) only in some temporal mode
  - Past, present, future
- Qualities of an object are genuinely intrinsic properties (weight, height, colors)
- The possessing of a quality by an object itself is a temporally relative affair (being of weight 40kg, being of height 180cm, being of color red)

Solution to the problem of qualitative change

- Qualitative change: at different times the object posses different qualities
- *a* **is-at-t** *F*
  - BC is-at-the-age-of-12 of weight 40kg
  - BC is-at-the-age-of-20 of weight 70kg

Interpretation of 'a is F at t'

Temporal realism
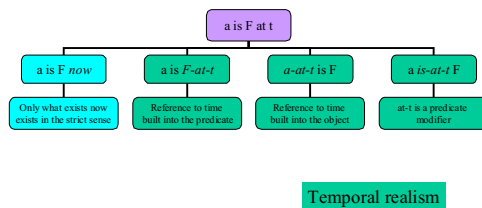
Summary

- Three kinds of change that persisting objects can undergo
  - Change of composition: a composite object has different components at different times
  - Change of quality: the same object has numerically different qualities at numerically different times
  - Substantial change: persistent objects begin or cease to exist
- Four different solutions to the question of how these kinds of changes can occur