

## 0 Last time

Last time, we looked at the problem of temporary intrinsics and solutions to it. Given the problems for the 3D Theory solutions, 4D Theory might start looking more attractive. Today's group of puzzles appears to motivate 4D Theory.

## 1 The Paradoxes of Material Constitution

### The Statue and the Lump of Clay

1. The lump of clay exists on both Monday and on Tuesday, even though on Tuesday it is statue-shaped.
2. The statue exists on Tuesday but not on Monday.
3. By the Identity of Indiscernibles, the statue and the lump of clay are two different material objects.
4. But this means that on Tuesday, the statue and the lump of clay are made up of the same matter.
5. Therefore, distinct material objects can be made up of the same matter at a single time.

Consider also the second version, where the statue is squashed on Wednesday, but the lump of clay still exists.

### Tibbles the Cat

1. Tibbles exists on both Monday and on Tuesday, since a cat can survive the loss of some of its parts (its tail, anyways).
2. Tibs also exists on both Monday and Tuesday, since it has all the same parts.
3. Tibbles  $\neq$  Tibs, since on Monday Tibbles and Tibs are made up of different matter.
4. But Tibbles and Tibs are made up of the same matter on Tuesday.
5. Therefore, distinct material objects can be made up of the same matter at a single time.

### Solution 1: The Constitution View

- This solution is simply to bite the bullet – that is, accept the conclusion that distinct material objects can be made up of the same matter at the same time.
- Objection: If the statue and the lump are made up of the same matter, how can squashing destroy one but not the other, since whether squashing occurs seems to be a purely physical matter?
- Objection: The constitutionalist must say that the whole is more than the sum of its parts, since the statue and the lump have all the same parts.

### Solution 2: Mereological Essentialism (ME)

- When we talked about the ship of Theseus, we considered ME: objects cannot survive loss of parts. That is, what parts an object has is essential to its individuation.
- Applied to the statue and the lump, ME denies that a distinct thing called a “statue” really comes into existence in the first place. What we’ve been talking about all along is a quantity of matter, the lump. Neither shaping it nor squashing it brings anything new into existence.
- Applied to Tibbles and Tibs, ME denies that anything persists between Monday and Tuesday. What we were calling “Tibbles” on Monday is simply destroyed.

#### Solution 3: Mereological Nihilism (MN)

- The puzzles only arise if we think there are such objects as statues, lumps, cats, and cat parts. MN denies that there are *any* ordinary objects; rather, there are only *mereological simples*.
  - These are smallest indivisible bits of matter. Candidates for mereological simples may come from fundamental physics.
- Objection: But... ordinary objects exist!
- Objection: This solution rests too much on an empirical hypothesis, which may turn out to be false.

#### Solution 4: The 4D Theory

- Ordinary objects on the 4D theory are spacetime “worms.” But then neither the statue nor the lump wholly exist at any one time. Rather, the statue is a worm the spans Tuesday, and the lump is a bigger worm that includes the statue as a part but spans a greater range of times.
- Likewise, Tibbles and Tibs are both worms, and Tibbles has Tibs as a part.
- It escapes the objections above:
  - None of the objects in consideration have all the same parts. So it is not the case that distinct material objects can be made up of the same matter at the same time (even though some are made up of the same matter at some times).
  - The whole is not more than the sum of its parts.
  - There are ordinary objects (even though they’re perhaps bigger than we thought).
  - No unsettled empirical hypothesis is assumed.