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The LED Theory of Material Objects

Michael Tze-Sung Longenecker
Notre Dame

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LED Theory Of Material Objects

Michael Longenecker

1. Views on the Persistence of Material Objects

In this paper I present a new theory of the nature and composition of material objects. Material objects are thought to persist over time and survive various changes. For example, in 2005, the tree in my front lawn (named ‘Titan’) was just a sapling. In 2010, Titan had grown 5-feet tall. By 2015, it is now 10-feet tall.

Now there are competing views about how Titan persists through time. On what is considered the ‘commonsense’ view, Titan persists by being ‘wholly present’ at each time at which it exists. Call this Endurantism.

On a popular alternate view known as ‘Worm Theory’ Titan persists by having a different temporal part at each time (See for example Heller 325-327). The idea is that just as Titan is spread out across space, so it is spread out across time—by having parts. Here we have the parts named as ‘α’, ‘β’ and ‘γ’ to represent the fact that they are distinct objects. None of these objects are identical to Titan, but they are all parts of it. So where Endurantism has only one thing—Titan—Worm Theory has it that there are more things than we might initially think. This is called ‘Worm Theory’ since objects look like worms spread out across time.
The view that I defend here is distinct from both views since it treats Titan as having non-concrete parts. A non-concrete object is an object that lacks many of the features that concrete objects typically have—size, shape, mass, location, causal abilities, etc.—but yet is unlike typical abstract objects since a non-concrete object could have those features.

Timothy Williamson has recently argued for such objects. He argues that it is impossible for something not to exist. For example, in any world in which the proposition <Socrates does not exist> is true, it must refer to Socrates. But if it refers to Socrates, then Socrates exists in that world. Hence, it couldn’t be that Socrates does not exist (Williamson 233). Nevertheless, it’s clear that Socrates could have never been born. In that case, Socrates would exist, but wouldn’t be a concrete thing. He wouldn’t have size, shape, mass, causal abilities, etc. (Williamson 246).

Here I am borrowing this ontology to present a new view. On this view, Titan has \( \alpha, \beta \) and \( \gamma \) as parts at each time at which it exists. Whatever parts it has, it has essentially—it can never change with respect to what parts it has. But what differs between times is which part is concrete. This view is similar to Endurantism since it
doesn’t treat Titan as being spread out across time. But it is also similar to Worm Theory since at each time, a different part of it is concrete.

I call this the ‘LED theory’ since material objects resemble LED display boards. Just as a board is composed of numerous lights, each of which can be on or off, so objects are composed of numerous parts, each of which can be concrete or non-concrete. To make the analogy tighter, we should imagine that the following is also true of the display board: each light can only be on for exactly one moment. No light can be on for more than a moment, nor can it turn on again at a later moment.

2. Argument for LED Theory

Why think LED theory is better than its competitors? The reason is that it is the only view that can preserve a particular compelling principle concerning the nature of parthood.

Let me begin by elucidating the notion of parthood that I have here. I take it to be the familiar notion that we work with when we say things like ‘the seat, back, legs and armrests are part of the chair’, and ‘the bits of wood are part of the seat’. I
Longenecker

will talk specifically in terms of what is known as *proper* parthood. This notion of parthood is irreflexive—an object is not a part of itself. So the chair is not a part of itself, nor the seat a part of itself. The relation is asymmetric—if $a$ is part of $b$, then $b$ is not part of $a$. Thus the chair is not part of the seat since the seat is part of the chair. It is also transitive—if $a$ is part of $b$, and $b$ is part of $c$, then $a$ is part of $c$. Since the seat is part of the chair, and the bits of wood are part of the seat, the bits of wood are part of the seat.

We should also notice that it's coherent to think that objects can partially overlap. In other words, it's possible that $a$ and $b$ are not identical, but share a part. For example, two chairs can overlap or share a part by sharing an armrest—think of theater seats. But what is clearly not possible is that two objects *completely* overlap. It's not possible for $a$ and $b$ to be not identical yet share all the same parts. So if we have Chair A and Chair B and every object that is a part of one is also a part of the other. Then the names 'Chair A' and 'Chair B' must refer to the same chair. I take this to be an eminently plausible principle. To deny this principle seems plainly absurd. Material objects are the type of thing that 'crowd out' other objects (see, for example, David Lewis 252).

**2.1 Against Endurantism**

But the problem for Endurantism is that there are cases that it is forced to interpret as being counter-examples to the principle. Consider the following simple scenario of David and Clump:
at $t_1$, a statue-maker purchases a piece of clay named ‘Clump’. At $t_2$, he shapes it into a statue and names the newly created statue ‘David’. In this scenario, Clump clearly continues to exist at $t_2$. Though pieces of clay don’t survive being burnt to a pile of ash, or being chopped into a thousand smaller pieces, they can surely survive various changes in their shape. So both Clump and David exist at $t_2$. They also share all the same parts at $t_2$ since every bit of clay or molecule that is part of one is also part of the other. Given No Complete Overlap, they must be identical. But the problem is that they are not identical since Clump existed on Monday, but David did not.

Worm Theory and the LED Theory have a leg up on Endurantism since they can avoid this problem. Worm Theory implies that David and Clump have temporal parts for each time at which they exist. And since David had not yet been created at $t_1$, Clump has a $t_1$ temporal part—namely $\kappa$—that David lacks.
The LED Theory also claims an advantage over Endurantism. David and Clump do not currently share all the same temporal parts since they differ with respect to their non-concrete parts. David is always composed of $\lambda$ and $\mu$, which are statue-shaped objects when concrete, and never has $\kappa$ as a part, which is lump-shaped when concrete. Clump, on the other hand is always composed of all three. David and Clump therefore always differ with respect to their parts since Clump always has $\kappa$ and David never does.

2.2 Against Worm Theory
But why should we prefer the LED Theory to Worm Theory? The reason is that there are cases similar to the David and Clump case in which the objects do not differ with respect to their spatial or even temporal parts. Consider the following case given by Allan Gibbard:

![Diagram of clay transformation](image)

the craftsman fashions the bottom half of a statue with one piece of clay and the top half with another, he then fuses the top and bottom halves to create the statue which he names ‘Davey’. Eventually he destroys Davey by slicing it in half. In this case it is clear that not only does Davey the statue comes into existence at $t_2$ but also some new piece of clay. This is because when joining pieces of clay, a new piece comes into existence. This piece of clay also goes out of existence at $t_3$ since a piece of clay can’t survive being cut into two (Gibbard 191). Call this piece of clay ‘Clumpy’. Clumpy and Davey share all the same temporal parts since they share the same spatial parts and come into and out of existence at the same times. But Clumpy and Davey also aren’t identical since Clumpy could survive all sorts of changes in shape (such as being squashed into a ball) that Davey could not survive.

A tempting response to this problem for the Worm Theorist is to extend the temporal parts idea to include modal parts as Takashi Yagisawa does (94).
According to this idea, we shouldn’t think of objects as spread out just in space and time, but also across possible worlds.

In this case, the worm in the actual world is not identical to either Davey or Clumpy, but is just a modal part of each. In other worlds, there are other worms that are also parts of them. But they do not share all the same modal parts since there is a non-actual world in which there is a smushed lump of clay worm that is part of Clumpy but not Davey, what I’m calling ‘φ’ in the diagram. But the obvious problem with this response is that there are no objects that do not actually exist. Davey and Clumpy cannot be ‘spread out across worlds’ in the sense that they have parts that do not exist in the actual world.

So the modal parts response will not work for Worm Theorists. However, it does show us how the LED Theory can be extended to address the problem. And that is just to add objects that act like modal parts. More precisely, we should think that there is an object that is actually part of Clump that would be a smushed lump
of clay, were it concrete. Though it is not actually ever concrete. This allows us to avoid the claim that there are things that don’t actually exist, since these modal-like parts do actually exist, though they are not actually concrete.

In the illustration, we see that $\varphi$, $\chi$ and $\psi$ exist in every possible world, though each is only concrete at a single world. When $\varphi$ is concrete, it is a lump-shaped object and when $\chi$ or $\psi$ are concrete, they are statue-shaped. Davey not only has $\chi$ and $\psi$ as parts, but necessarily has them as parts. Likewise, Clumpy necessarily has $\varphi$, $\chi$ and $\psi$ as parts. On this view Davey and Clumpy don’t violate No Complete Overlap since it’s not possible for them to share the same parts. For this reason, the LED Theory is superior to the competitors considered above. It alone can preserve No Complete Overlap.

*University of Notre Dame*
Works Cited


