

CHAPTER 7

Constitution

Theodore Sider

The Antinomy of Constitution

‘It is impossible to hold just one material object—an ice cube, or a soda can, or a clay statue—in one’s hand. Wherever there appears to be only a single material object, there are in fact two.’

Only a philosopher would dream of arguing for such a thing. As Bertrand Russell once said, ‘the point of philosophy is to start with something so simple as not to seem worth stating, and to end with something so paradoxical that no one will believe it’. But mere shock value is not the aim. Philosophers grapple with arguments that have counter-intuitive conclusions because these arguments reveal hidden complexity in the world, even at the mundane level of ice cubes, soda cans, and statues.

Here is the argument for the counter-intuitive claim we began with. Ice cubes, soda cans, and clay statues are made up of matter. An ice cube is made up of water molecules, a soda can of aluminum, a clay statue of clay. So wherever there is a material object, there is also another object: a **quantity (piece) of matter**. Where there is an ice cube, there is also a quantity of water; where there is a soda can, there is a piece of aluminum; where

there is a clay statue, there is a piece of clay. The ice cube, soda can, and statue are *made up of*, or **constituted** by, these quantities of matter. But they are not the same objects as the quantities of matter. For consider: the quantity of water making up the ice cube existed long before the ice cube was made. And if the ice cube is allowed to stand at room temperature, it will melt and so be destroyed, but the quantity of water will continue to exist. A sculptor begins with a piece of clay. By shaping it into the right form, she creates a statue, which did not exist beforehand. If she tires of the statue, she can squash it and so destroy it, though squashing it does not destroy the piece of clay. Thus, the piece of clay is not the same object as the statue, for it exists before the statue does and continues to exist after the statue is destroyed. Think of it this way. The sculptor began with a piece of clay. That's one object. She then created a new object, the statue. That's a second object. So after she finished sculpting, there existed two objects, the piece of clay and the statue. Thus, when I hold a statue in my hand, there are actually two objects there, a statue and a piece of clay. There only appears to be one, but there are really two.

The conclusion of this reasoning is that the statue and piece of clay are two different objects. But this is very hard to accept. Think of how similar to each other these objects are. For one thing, they are located in exactly the same place. Also, they are made up of exactly the same matter, which in turn means that they have exactly the same size, shape, weight, color, and texture. They are even more similar to each other than two duplicate billiard balls fresh from the factory, for such billiard balls are made up of different matter, and have different spatial locations. Given the similarity between the statue and the piece of clay, isn't it absurd to claim that they are two different objects? And yet they are; they must be, because the piece of clay existed before the statue, and could exist after the statue is destroyed.

This is an example of what the twentieth-century American philosopher W. V. O. Quine calls an **antinomy**: apparently sound reasoning leading to an apparently absurd conclusion. Philosophers prize antinomies, because they are bound to teach us something. Once caught in the antinomy, we cannot rest content with the status quo; something has to give. Either the apparently sound reasoning is not sound after all, or else the apparently absurd conclusion is not as absurd as it seems. Our job is to figure out which.

Assumptions of the Antinomy

To start, we must identify the crucial assumptions in the antinomy of constitution, especially any tacit assumptions we may be making without noticing. The most obvious assumption is:

Creation: The sculptor really does create the statue—that is, the statue did not exist before the sculptor sculpted it.

The argument also makes some less obvious assumptions:

Survival: The sculptor does not destroy the quantity of clay by forming it into a statue.

Existence: There really are such objects as statues and pieces of clay.

And finally, the conclusion of the argument must really be absurd for the antinomy to bite:

Absurdity: It is impossible for two different objects to share the same matter and spatial location at a single time.

Assuming there are no other assumptions we have missed, we must reject Creation, Survival, Existence, or Absurdity, in order to resolve the antinomy. Investigating these assumptions will shed light more generally on the nature of material objects.

The Just-Matter Theory

Let's begin with Creation, which says that the statue only began to exist when the sculptor shaped the piece of clay into statue form. Someone who wanted to deny this assumption could say instead that the sculptor creates nothing, but simply *changes* the piece of clay. Painting a red barn green creates nothing; it only changes the color of the barn. Likewise, it may be said, the sculptor merely changes the shape of the piece of clay from a rather lumpy shape into a statue shape.

This would avoid the absurd conclusion that two different material objects share the same matter. Just as the previously red barn is the same barn as the subsequently green barn, so the previously lumpy-shaped piece of clay is the same piece of clay as the subsequently statue-shaped piece of clay. When you hold the statue in your hand, you are holding just one thing: a piece of clay with a statue shape.

This response may be based on a general theory of the nature of material objects. Consider the **just-matter** theory, according to which hunks (quantities, pieces) of matter are the *only* objects that exist. A hunk of matter is defined by the matter making it up. The only way to create a hunk of matter is to create some new matter. Merely rearranging pre-existing matter creates no new hunks, it only changes old hunks. That is what happens when the sculptor shapes the piece of clay into statue form. Likewise, the only way to destroy a hunk of matter is to destroy some of its matter. Rearranging or even scattering the matter changes, but does not destroy, the hunk. So squashing the statue destroys nothing. The piece of clay has gone back to having a lumpy shape, but it still exists.

The just-matter theory leads to shocking conclusions—perhaps as shocking as the absurd conclusion of the antinomy that we're trying to avoid. We ordinarily think of sculptors as creating things. Likewise, we ordinarily think that freezing water

in a freezer tray or shaping aluminum in a factory *creates* ice cubes and soda cans. The just-matter theory denies this. It says that the ice cube in your drink existed before it was frozen, though it would not then have been called an ice cube; your soda can existed long before it was shaped in the factory, though it would not then have been called a soda can.

A wrecked car is towed to a junkyard, where it is crunched, taken apart, and sold for scrap material. This destroys the car, right? Wrong, according to the just-matter theory! The quantity of matter we formerly called 'the car' has merely been scattered. All that metal (and plastic and rubber) still exists, sold to various people in different locations. Since none of the matter itself has been destroyed, the hunk of matter remains. The object we used to call 'the car' still exists, though we can no longer call it a car since it no longer has a car shape.

An even more extreme example: when Socrates died over two thousand years ago, his body was buried and then slowly rotted. By now, the matter that once composed him has been dispersed over the Earth's surface; some of it has even escaped the planet altogether. Still, none of that matter itself has perished. So according to the just-matter theory, Socrates still exists. Or, more accurately, the object we formerly called 'Socrates' still exists. We can no longer call it 'Socrates' or a 'person', since it no longer has a human form; it is now a scattered object, like a deck of cards strewn across a table. But it still exists. For similar reasons, the just-matter theory implies that you yourself existed thousands of years ago, for the piece of matter that is now you existed then. It was not then a person, since it was scattered across the Earth, but it existed nevertheless.

Maybe in the end we should accept these strange claims that the just-matter theory makes. But let's first look at some other options.

The Takeover Theory

We might instead reject Survival. In order to derive the absurd conclusion that the sculptor's work results in two different objects, we needed to assume that she created the statue (Creation), but we also needed to assume that she did not destroy the original piece of clay (Survival). For if creating the statue destroys the piece of clay, then at each point in the process there is only a single object, and we avoid the antinomy's conclusion.

Can a piece of clay *really* be destroyed simply by reshaping it? Though that's hard to believe, it shouldn't be dismissed out of hand. As we'll see, *every* response to the antinomy requires saying something a little strange. (That's what makes the antinomy of constitution such a good one.) We should instead ask for more information: *how* does reshaping the piece of clay destroy it? What general theory of objects justifies this claim?

The best answer is the **takeover theory**. An object, such as a piece of clay or a statue, is made up of certain particles of matter. Depending on how a group of particles are arranged, they will constitute an object of a certain sort, for instance, the sort *piece of clay* or the sort *statue*. When the clay particles in our antinomy were arranged in a lumpy way, they constituted a piece of clay. Later, after being moved around by the sculptor, they were arranged so as to constitute an object of a different sort, a statue. But according to the takeover theorist, particles can only constitute one object at a time. So as soon as the particles are arranged in statue form, the sort *statue* **takes over** from the sort *piece of clay*: the piece of clay stops existing, and in its place a new object, a statue, starts to exist. The particles no longer constitute the original piece of clay; that piece of clay no longer exists. The particles now constitute a different object, a statue.

An object's sort determines what kinds of changes the object can, and cannot, survive. Objects of the sort *statue* must retain a statue shape. So if the statue is squashed, and ceases to be

statue-shaped, that statue stops existing; the sort *statue* hands control of the particles back to the sort *piece of clay*, and an object distinct from the statue comes into existence. At any one time, only one sort has control of the particles; at any one time, those particles make up just one object.

The takeover theory agrees with the just-matter theory that only one object can be constituted by a group of particles at a time. But the just-matter theory says that the sort of the constituted object, no matter how the particles are arranged, is always the sort *quantity of matter*, whereas the takeover theory says that the sort differs depending on how the particles are arranged. Appropriately arranged particles can constitute statues, ice cubes, or soda cans. This is certainly an advantage for the takeover theory: it means that not all objects are defined by their matter. Whether objects of sorts like *statue* and *person* persist through various changes does not depend merely on whether their matter continues to exist; how the matter is arranged is significant. Statues, for instance, go out of existence when they are squashed, even if their matter continues to exist. Neither are persons defined by their matter. Thus, Socrates no longer exists according to the takeover theory: when his body rotted, the sort *corpse* took over from the sort *person*, and the person that formerly existed—Socrates—ceased to be.

Still, on balance, the takeover theory seems worse than the just-matter theory. It says that the piece of clay is destroyed when the sort *statue* takes over from the sort *piece of clay*. Thus, one can destroy a piece of clay just by kneading it into a statue shape. Try convincing someone of *that* at your local bar! (Many would admit that a piece of clay can be ‘transformed’ into a statue, but the takeover theory denies a ‘transformation’, which is a way of continuing to exist, and insists on a replacement.) So *each* theory says something unintuitive about the changes objects can and cannot survive: the just-matter theory says that persons can exist after rotting and disintegration; the takeover theory says

that pieces of clay *cannot* exist after acquiring more artistic shapes. So far the score is even, one strike against each theory. But now compare the theories in a more abstract way: which has a more intuitively satisfying *rule* for what objects exist? The just-matter theory has a clear rule: all objects are hunks of matter. The takeover theory provides no such clear rule. It does tell us what objects exist in some cases. It tells us, for example, that the sort *statue* takes over when the piece of clay is sculpted, and that the sort *person* relinquishes its hold when a person disintegrates. But what *general* rule tells us in *all* cases when one sort takes over from another?

Imagine a takeover theorist from Mars. Instead of sorts like *statue* and *piece of clay*, beloved of Earthly takeover theorists, Martian takeover theorists speak of sorts like:

outpiece: piece of clay located outdoors, no matter how shaped

inpiece: piece of clay located indoors, no matter how shaped

Earthly takeover theorists say that when a piece of clay is made into a statue, it stops existing and a statue takes its place. Of course, whether the clay is indoors or outdoors is irrelevant to what objects exist. Martian takeover theorists see things very differently. They view the world in terms of inpieces and outpieces, not statues and pieces of clay. When an outpiece is brought indoors, they say, the sort '*inpiece*' takes over, the outpiece goes out of existence, and a new inpiece comes into existence. This inpiece exists so long as the clay is indoors. Whether it is shaped into statue form is irrelevant to what object exists. But if it is taken outdoors, it stops existing and is replaced by an outpiece.

Earthly and Martian takeover theorists agree that the conclusion of the antinomy is absurd; they agree that there are never two distinct material objects made of the same parts. So each must think that the other is mistaken about what the correct sorts are, and about what objects exist. For consider the sculptor,

inside her house, about to begin sculpting. The Earthling and the Martian agree that she holds a single object in her hand, but they disagree over what its sort is. The Earthling thinks that the object is a piece of clay, which will be destroyed when sculpted into a statue. The Martian thinks that it is an inpiece, which will survive being sculpted but will be destroyed when taken outdoors. They cannot both be right, since the same object cannot both continue and cease to exist. Thus, our own Earthly takeover theorist must say that the Martian is mistaken: inpieces and outpieces simply do not exist.

But how can this claim be justified? The Earthly takeover theorist's choice of sorts suspiciously mirrors the words we here on Earth happen to have coined. We could have invented different words; we could have gone the way of the Martians and introduced words for inpieces and outpieces rather than statues and pieces of clay. If we had, the Earthly takeover theorist must say, then we would have been mistaken in nearly all our judgments about when objects come into and go out of existence, for the true objects are pieces of clay and statues, not inpieces and outpieces. It is nothing short of a miraculous coincidence that reality just happens to contain objects matching *our* current words rather than those of the Martians. Believing in pieces of clay and statues to the exclusion of inpieces and outpieces would be anthropocentric.

Nihilism

Takeover and just-matter theorists agree that in any given case, there is a single sort of object present. The former's choice of *which* sort of object exists is suspiciously anthropocentric. The latter's choice is more objective, but has counter-intuitive consequences.

Since it is so hard to choose what sort of object exists in a given case, perhaps we should say that *no* sort of object exists. This is

what the nihilist says. Thus, the nihilist challenges the assumption of Existence, according to which statues and pieces of clay are existing entities. If there simply are no such things as statues or pieces of clay (or inpieces or outpieces), then our antinomy does not get off the ground.

Is it wholly absurd to deny the existence of pieces of clay and statues? After all, we can just *see* pieces of clay and statues, can't we? Philosophers seek the *truth*; they are not merely trying to provoke, or annoy, or say whatever they can get away with. They often make surprising or unfamiliar claims, but these claims must always be reasonable; they should not directly contradict the evidence of our senses. Otherwise, even if we don't know exactly how to refute the philosopher, we may justifiably write him off as playing an idle game.

In fact, denying the existence of statues and pieces of clay isn't wholly absurd, and doesn't contradict the evidence of our senses. Consider the immense number of sub-atomic particles that make up what we call the statue. The nihilist agrees that these particles exist; she doesn't reject the existence of *everything*. Now, most of us think that, in addition to these septillion or so particles arranged in statue form, there also exists a septillion-and-first entity, namely the statue itself, which is composed of the septillion particles. But according to the nihilist, there is no statue. There are only the septillion particles, arranged in statue form; there is no septillion-and-first entity. In fact, according to the nihilist, the *only* things that exist are **particles**, that is, things with absolutely no smaller parts. Even protons and neutrons do not exist, for those things contain quarks as parts. Only the ultimate particles of physics (for instance, quarks and electrons) exist. The nihilist avoids the conclusion that the statue and the piece of clay are two things made up of the same matter by saying that neither the statue nor the piece of clay exists at all. Indeed, no objects larger than a particle exist—not even you yourself! There is no you; there are only particles arranged in person form.

Nihilism is not wholly absurd because everyday sensory experiences do not tell us whether there exist only particles, or whether there exist in addition objects composed of those particles. I (or rather, a number of particles arranged in 'me form') look in front of me and have a certain sensation, apparently of a computer screen. But that same sensation could be produced by mere particles arranged 'computerscreenwise'. How could I tell whether, in addition to the particles, there is also the computer screen? Even those of us who believe in computer screens agree that they look, feel, and smell as they do because of the arrangement of their septillion or so microscopic bits. So we must admit that the bits would look, feel, and smell the same regardless of whether they compose a septillion-and-first thing.

But even if nihilism isn't wholly absurd, and can't be disproven by simple observation, it is still pretty absurd. After all, following Rene Descartes, the seventeenth-century French philosopher, I can't disprove by simple observation that I'm not on Mars dreaming an extremely vivid dream. (Descartes himself thought that he could prove the existence of a benevolent God who would protect him from being so drastically mistaken, but his arguments are unconvincing.) I might pinch myself to see whether I am dreaming, but I could just be dreaming the pinch! Yet, philosopher though I am, I don't doubt for a moment that I'm currently located on the planet Earth. It seems reasonable to simply ignore the outlandish possibility that I'm dreaming on Mars. Now, it's hard to say exactly when it is reasonable to ignore such possibilities. But perhaps nihilism is outlandish enough to be in the same category as the dream scenario: difficult to refute but safe to ignore.

Anyway, nihilism may not even work on its own terms. It assumes that the world is ultimately made up of particles, that is, things with no smaller parts. But perhaps there are no such things as particles. Have you ever (late at night, perhaps in an altered state) entertained the hypothesis that our entire universe

is just a tiny speck in a giant other universe? And that within each atom of our universe, there exists a whole other tiny universe? And that in each of the 'atoms' of this tiny universe, there is contained yet another universe? If this sequence continued forever, there would be no particles, since each object would contain smaller parts. I suppose these thoughts are as idle as Descartes's dream hypothesis, but a less psychedelic version is more worrisome: perhaps each particle contains smaller parts, if not an entire universe. When chemistry first discovered the atom, no one knew that atoms had smaller parts. Then protons, neutrons, and electrons were discovered. Still later, scientists learned that even protons and neutrons have smaller parts: quarks. As scientists develop more and more powerful tools, electron microscopes and whatnot, they keep telling us of smaller and smaller objects. Perhaps this process will continue without end; perhaps every object, no matter how small, has still smaller parts. In each of these scenarios, no particles exist, since every object has smaller parts. Now, *absolute nihilism*, which says that no objects at all exist, not even particles, is too silly to take seriously, for it cannot explain the evidence of our senses that objects at least appear to exist. So in either scenario, there must exist *some* objects; and given how the scenarios were described, these objects must have smaller parts. Nihilism would therefore be false in either scenario. Moreover, if some objects with smaller parts do exist, then there is no reason to deny that statues and pieces of clay are among these objects. And if so, we still face the antinomy of constitution. Nihilism does not help in the imagined scenarios, the second of which, at any rate, may for all we know be correct.

Cohabitation

Like the assumptions of Creation and Survival, the Existence assumption is hard to question. Since these are the only

assumptions made by the argument, we are slowly being backed into a corner. The only remaining possibility is to question our intuition that the conclusion of the argument is absurd: in other words, to reject Absurdity. Perhaps two material objects can, after all, share the same matter and spatial location at the same time. We can call this the hypothesis of **Cohabitation**, for it says that the same region of space can be inhabited by more than one object.

Our problem has been to choose what sort of object sits in the sculptor's hand. The just-matter theorist says: a *piece of matter*. The takeover theorist says: a *statue*. The nihilist refuses to choose, and says: *neither*. The defender of Cohabitation also refuses to choose, and says: *both*.

Cohabitation seems strange, but are there any *reasons* against it? Yes; here are two. First, just before the sculptor squashes the statue-shaped clay, she allegedly holds in her hand two objects, a statue and a piece of clay. Then she presses her hands together, squashing the clay. According to the defender of Cohabitation, this destroys only one of the objects: the statue is destroyed while the piece of clay carries on. But the sculptor squashed the piece of clay just as hard as she squashed the statue; she exerted the same pressure with her hands on each object. So, we must conclude, the statue is far more vulnerable to squashing than the lump; it is much more delicate. But how can that be? The statue is *exactly like* the piece of clay in all of its physical characteristics. It is made up of exactly the same matter as the piece of clay, arranged in exactly the same configuration.

Second, the very idea that the same parts could make up *two* things clashes with the concept of a part. Here's an absurd story: 'A woman once decided her house needed a change, so she painted every part of it bright orange. But even though all its parts changed color, the house itself did not change color at all; it stayed exactly the same.' The story is absurd because it supposes that the house is something over and above its parts. Like any

whole object, a house is in some sense nothing more than its parts taken together. But if this is right, then we must reject Cohabitation. If a whole is nothing more than its parts, then the same parts cannot form *two* wholes; otherwise one (or both) of the wholes would have to be different from its parts.

Four-Dimensionalism

We are running out of options! The argument for the antinomy made only three assumptions: Creation, Survival, and Existence, none of which is easy to deny. Defenders of the just-matter theory reject Creation, but are committed to the counter-intuitive claim that Socrates still exists. Takeover theorists reject Survival, but face the charge of anthropocentrism. Nihilists reject Existence, but are left with a theory too radical to believe. So the conclusion of the argument—that statues and pieces of clay are distinct objects made up of the same matter—follows. But accepting the conclusion, and therefore Cohabitation, itself faces two powerful arguments. What to do?

A remaining theory of material objects allows us to accept Cohabitation and to rebut the two arguments. That theory is **four-dimensionalism**.

Begin with the theory that ‘time is like space’, as discussed in Chapter 3. Think of time as a fourth dimension, alongside the three spatial dimensions. This is clearest in pictures. Consider the space-time diagram, Figure 4, that we saw in Chapter 3. The relevant feature of the diagram is that it depicts objects as having **temporal parts** as well as spatial parts, which is the core claim of four-dimensionalism. We tend to think only of spatial parts: a person’s hands and feet, a car’s doors and steering wheel. A person’s spatial parts are spatially smaller than that person: they occupy smaller spatial regions than the entire person. But the four-dimensional perspective reveals temporal parts as well.

A person's temporal parts are temporally smaller than the person: they exist in a smaller temporal interval than the entire person. The diagram pictures a dinosaur, a person, and their temporal parts. Let's focus on the person:



and her temporal parts:



Each of these temporal parts exists at only one time, just as each of a person's smallest spatial parts exists at only one place. The person as a whole consists of all her parts put together, both temporal and spatial.

Consider the statue and piece of clay from the four-dimensional perspective (Figure 10). The diagram depicts a piece of clay which first has a lumpy shape, then is formed into a statue of a star, then is squashed back into a lumpy shape. The diagram depicts Cohabitation, since it depicts the statue as being a different object from the piece of clay. The piece of clay is the

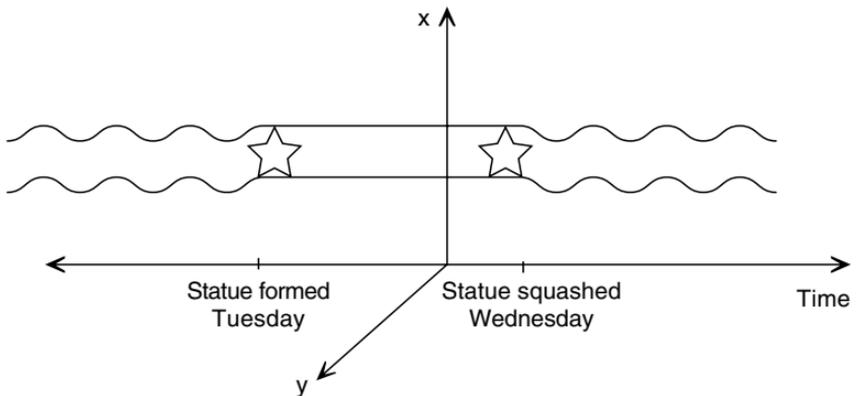
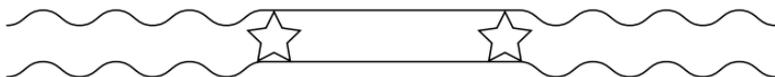


Fig. 10. Four-dimensional perspective on the clay statue

entire object, which begins long before being shaped into statue form and lasts long after being squashed:



The statue, on the other hand, is an object that exists only when the piece of clay is star-shaped:



As Figure 10 shows, the statue is part of the piece of clay. So the statue and the piece of clay are two different objects, just as you are a different object from your hand. Thus, four-dimensionalism embraces the conclusion of the antinomy, namely that the statue and piece of clay are two different objects.

We saw that Cohabitation faces two objections. Given the four-dimensional picture, the objections melt away. Let's take them in reverse.

The second objection was that Cohabitation violates the principle that a single set of parts cannot compose two different wholes. In fact, from the four-dimensional perspective, the principle is not violated at all. The space-time diagram clearly shows that the statue and the piece of clay do *not* have exactly the same parts. The piece of clay has more parts than the statue, since it has temporal parts located to the future of the statue:



as well as to the past of the statue



The statue and piece of clay only *appeared* to have the same parts because we were neglecting the fourth dimension of time.

The first objection asked how the statue can be so fragile when it is made of the same material as the sturdy piece of clay. To answer this objection, let us continue to press analogies between space and time. One useful spatial analog of the statue and the piece of clay is a long road and one of its smaller parts. US Route 1 runs up the east coast of the United States all the way from Florida to Maine; a short section in Philadelphia is called the Roosevelt Boulevard. The Roosevelt Boulevard is *part* of Route 1. They are of course two different roads, since Route 1 extends much longer (in space). But no one wonders why the Roosevelt Boulevard is so fragile as to stop existing at the city limits of Philadelphia, despite the fact that it is made of exactly the same asphalt within the city limits as is Route 1. Its termination at the city limits is merely the result of a decision by the good people of Philadelphia to use the words 'The Roosevelt Boulevard' for a mere part of Route 1. This analogy shows why the first argument against Cohabitation is misguided, given the four-dimensional picture. Why does only the statue go out of existence upon squashing? Answer: this is merely the result of our choice to use the word 'statue' only for the statue-shaped temporal parts of a piece of clay.

If you are still inclined to worry that the first objection threatens four-dimensionalism, this may be because of a mistaken picture of the two objects in the sculptor's hand, namely, a picture of two objects 'directly' present. If I touch your nose, I am in a sense touching two things, you and your nose. But your nose is the only thing I touch directly. I touch *you* indirectly, *by* touching your nose, which is part of you. The correct picture of the two objects in the sculptor's hand is analogous. There is just one object directly in the sculptor's hand, namely the current temporal part common to both the statue and the piece of clay.

The statue and the piece of clay themselves are in the sculptor's hand only indirectly, by containing a temporal part that is directly in the sculptor's hand.

If both the statue and the piece of clay were directly present in the sculptor's hand, then perhaps the survival or destruction of these entities would depend on their current physical characteristics, in which case we would indeed face the question of how the statue could be so fragile when the piece of clay is so robust. But since the only thing directly in the sculptor's hand is the current temporal part of both the statue and the piece of clay, what happens afterwards is just a function of the physical characteristics of the temporal part and what she does to it. If she squashes it, then there will be further temporal parts with lumpy shapes; if she leaves it alone, then those temporal parts will continue to be statue-shaped. There remains the question of what we will *call* various aggregates of temporal parts, depending on what those further temporal parts are like. We only call statue-shaped aggregates 'statues'. So if the sculptor squashes the statue and the further temporal parts have lumpy shapes, only the aggregate terminating at the squashing counts as a 'statue'.

Note that four-dimensionalism avoids the charge of anthropocentrism that the takeover theory faces. The English language contains a word ('statue') for collections of statue-shaped temporal parts of clay. It contains no words for collections of *indoor* or *outdoor* temporal parts of clay. Nevertheless, such collections exist. These objects are what the Martians would call 'inpieces' and 'outpieces'. Four-dimensionalism says that these strange collections are just as real as our familiar statues and pieces of clay. Compare the collection of segments of US Route 1 that are located within cities whose names begin with the letter 'A'. We have no word for this 'Route A', but it exists; it is just as real an object as Route 1. Thus, four-dimensionalists must admit the existence of inpieces and outpieces, *in addition to* statues and pieces of clay.

Some philosophers think inpieces and outpieces are strange entities, and dislike four-dimensionalism accordingly. Others dislike four-dimensionalism because they doubt that time is like space. Still others are suspicious of temporal parts: instantaneous objects popping into and out of existence at every moment. I myself have no problem with these things. Accepting inpieces and outpieces on an equal footing with statues and pieces of clay is an excellent way to avoid the charge of anthropocentrism leveled against the takeover theorist. Treating time like space has been fruitful in contemporary physics. As we have seen in this chapter, it is fruitful in metaphysics as well. Instantaneous objects popping into and out of existence? Perhaps that is a bit of a surprise. But any solution to the antinomy of constitution is bound to have some surprising feature. Otherwise the antinomy would not have vexed metaphysicians for so long.

FURTHER READING

The following article concerns antinomies and their importance in philosophy: W. V. O. Quine, 'The Ways of Paradox', in his book *The Ways of Paradox and Other Essays* (Random House, 1966).

Chapter 3 of Roderick Chisholm's book, *Person and Object* (Open Court, 1976) defends the just-matter theory (which is often called 'mereological essentialism').

Michael Burke defends the takeover theory (though he does not give the theory that name) in this fairly technical article: 'Preserving the Principle of One Object to a Place: A Novel Account of the Relations Among Objects, Sorts, Sortals, and Persistence Conditions', in Michael Rea (ed.), *Material Constitution* (Rowman & Littlefield, 1997).

Inpieces and outpieces are based on Eli Hirsch's 'incars' and 'outcars', introduced on p. 32 of his book *The Concept of Identity* (Oxford University Press, 1982). The primary question of Hirsch's book is: how do material objects continue to exist over time?

For further reading on nihilism, a good source is Trenton Merricks's book *Objects and Persons* (Oxford University Press, 2001), especially chapters 1 and 2. Merricks is not a true nihilist, since he believes in persons as well as particles. Close enough—he does not believe in statues or pieces of clay.

Chapter 1 of my book *Four-Dimensionalism* (Oxford University Press, 2001) is an accessible presentation of four-dimensionalism. Chapter 5 is a more technical discussion of the problem of constitution.