Simply Possible[*]

Abstract

In the process of arguing against all theories of extended material objects made up of simples, Dean Zimmerman has recently argued against the compossibility of continuous closed and continuous open material objects. But it is surely undeniable that point-like material objects are possible; plausible principles of recombination and the principle of unrestricted composition then lead to the possibility Zimmerman rejects. Fortunately, Zimmerman's arguments (inspired by Brentano's remarks on the concept of contact) can be resisted: what appear to be implausible modal consequences of the compossibility of open and closed continuous material objects turn out to be merely the results of a decision to use 'material object' in a certain way.

It is exceedingly plausible that the following picture might have been true, that in some possible world it is true. Material objects are wholly composed of *simples*, which for the purposes of this paper may be taken to be point-sized objects without proper parts.[1] Moreover, unlike actual material objects which are mostly empty space, these material objects occupy extended continuous regions of space. In such a continuous object, each of the continuum-many points in the region is occupied by exactly one simple.

More generally, any region of space is possibly occupied by material simples. A region of space is a subset of the set of all points of space; a region of space is occupied by simples iff each point in that region is occupied by a simple; my claim is that for every region of space, there is a possible world in which that region is occupied by simples, and no point not in that region is occupied. Still more generally, I would claim that any sequence of regions over time is occupiable in this way: given any function from times to regions, there is a possible world in which at any time, the region assigned to that time is occupied by material simples, and no point not in that region is occupied at that time. These claims may be supported by familiar principles of recombination: given

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[*]Thanks to Earl Conee, John O'Leary Hawthorne, Hud Hudson, and Dean Zimmerman for helpful comments.

[1]I do not mean to rule out the possibility of extended mereological atoms, nor of point-sized objects with proper parts.

any point it is possible for a material simple to occupy that point; individual points being occupied by simples are independent states of affairs; therefore, any assignment of material simples to points over time is possible.[2]

If these are indeed possibilities, it follows that there are possible worlds containing both *open* and *closed* material objects, assuming as I do the principle of unrestricted mereological composition, which states that every class has a fusion, or mereological sum. Consider a certain cubical region of space, exactly 2 units of length (in some precise unit of measure) to an edge, in which every point is occupied by a simple material object (assume that the cube includes its boundary points, in a sense to be explained below). We can divide the simples in this region into two disjoint classes, the left class and the right class. The left class consists of all the simples in the cube that are *less than or equal to* one unit of length from the left face of the cube. The right class consists of all the simples in the cube that are *strictly less than* one unit from the right face. By the principle of unrestricted composition, those classes have sums, which we may call "Lefty" and "Righty". Notice that the left class contains simples on a plane cutting the cube in half, since points exactly one unit from the left face of the cube were included in the left class. Thus, Lefty, the fusion of the left class, will be a *closed* object, in that it has simples in all its "boundary points": a boundary of Lefty is its right side, the plane running down the middle of the cube, and Lefty includes all the points on that plane. Now, that plane is also a boundary of Righty, the fusion of the right class. But while the right class has simples arbitrarily close to the plane, it does not contain any simples in the plane. Righty, therefore, fails to contain simples in all its boundary points, and is therefore said to be (partially) *open*; it lacks a "skin of simples" on its boundary.[3]

I say, then, that extended material objects made of simples, both open and closed, are possible. To the extent that we're attached to the principles that led us to this conclusion, the principles of recombination and of unrestricted

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[2]This is a mere sketch of an argument; the rigorous formulation of the required principle of recombination and the resulting argument is a non-trivial task, and is mostly beyond the scope of this paper, in which I am primarily concerned to rebut a certain argument against the compossibility of open and closed objects. See Lewis (1986, section 1.8), on recombination principles, although note that I go beyond Lewis's principle in claiming the possibility of closed and open *material* objects. A wrinkle (which can, I believe, be overcome) is that recombination principles are typically restricted to intrinsic properties; but the property of being a material object is arguably extrinsic.

[3]See Zimmerman (1996, pp. 5–6) for more rigorous definitions of 'closed', 'open', 'boundary point', etc.

mereological composition, we should be attached to the claim that this is a genuine possibility. This possibility, however, runs up against arguments due to Franz Brentano, which have been revived and defended in a recent article by Dean Zimmerman (1996). In fact, Zimmerman gives many arguments in an attempt to refute all theories of extended material objects made up of simples, but I'll consider only the part that concerns the coherence of the picture I've sketched above.[4] According to Zimmerman, open and closed extended material objects made up wholly of simples would run afoul of Brentano's difficulty involving the notion of objects being in contact, or touching.

The core argument may be brought out by a thought experiment. Imagine separating the objects considered above, Righty and Lefty, and then pushing them toward each other. They will be able to come into perfect contact. The open side of Righty will mesh perfectly with the closed boundary of Lefty, in that there will be parts of Righty arbitrarily close to parts of Lefty. In contrast, imagine pushing together two rectangular solids with closed surfaces. As before, each has a plane for a boundary, but now each contains all the points on its boundary plane, and so there is no way for the boundaries of the two to perfectly mesh. However hard you pushed the solids together, they would still be separated by some finite distance. What prevents the solids from getting closer? Must some mysterious repellent force invariably accompany any closed object? It might be responded that the boundaries of the solids could overlap. But Zimmerman (section 2) argues that the concept of a *material object* requires that no two material objects can coincide in space (at least, no two material objects of the same "impenetrability kind"[5]); overlap would require coincidence between the simples on the boundaries.

The argument, then, is that if open and closed extended objects made out of simples were compossible, mysterious repellent forces would be *necessarily* present when objects of certain shapes interacted, but not when objects of other shapes interacted. Repellent forces would be required for any pair of proximate closed objects, for no matter how hard they were pushed together, they would still remain separated. No such force would be required, however, when an object with an open surface encountered a closed object, for then the surfaces

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[4]This primarily occurs in connection with principle (C), which is stated on p. 10; see especially section 5. Zimmerman's rich paper contains much more of interest than I have space to consider here.

[5]Following Sanford (1970), Zimmerman allows (p. 3) that perhaps the concept of a material object requires merely that material objects be impenetrable by *some* other objects. I'll mostly ignore this complication.

could come in perfect contact. But surely, the existence of repellent forces keyed to interactions between objects of certain shapes is a contingent matter. Therefore, open and closed extended objects are not compossible.

My criticism of this argument will be more easily appreciated after consideration of some examples.

Example 1: Let us define a "permanent bachelor" as a man who never marries. Then, there are no possible worlds in which a permanent bachelor marries. In many of these worlds, permanent bachelors will come very close to getting married. They will approach the altar only to lose their nerve, be stricken down by lightning, or have someone speak rather than holding his peace. What keeps these permanent bachelors from being married? Must we postulate a mysterious antinuptual force? Of course not; we simply reserved the term 'permanent bachelor' for men that never get married. What keeps the permanent bachelors from getting married varies from case to case. Sometimes it is personal choice, at other times an act of God, and at yet other times pure chance. In many other possible circumstances these impediments to marriage are overcome; in those cases the men involved do not count as permanent bachelors.

Example 2: Imagine various possible circumstances in which a deadly marksman with deep hatred in his heart travels back in time with the sole purpose of killing his Grandfather as a young boy. By stipulation, the marksman has the will and the way to kill his grandfather, and yet his grandfather is, well, his *grandfather*; hence, various remarkable happenings occur in these worlds. In some, the marksman's formerly bitter heart inexplicably softens; in others, he develops bad eyesight and his aim fails; in still others the young grandfather is a paranoiac who carries his own gun and gets the drop on the marksman. What mysterious force protects the grandfather? None, of course. The grandfather is always protected (except in cases where the grandfather dies but is resurrected, or has frequented a sperm bank, or had previously time-traveled into the future to reproduce, or ...), but there is no one inevitable force operative in each case. In describing the case, we stipulated a number of facts: that the time traveler was descended from the grandfather, that he was a good shot, that he intended to kill his grandfather, etc. Only worlds containing one of various remarkable occurrences are consistent with all the stipulations. The "remarkable" fact that the grandfather's genes are always preserved is simply a result of our deciding to consider only possibilities in which these stipulations hold, just as the prolonged singleness of the men we considered in Example 1 resulted from our restricting

our attention to those satisfying the definition of 'permanent bachelor'.[6]

Example 3: Suppose we stipulatively define the term 'shmaterial object' in such a way that no two shmaterial objects come within 5 meters or closer of each other. There will be many worlds in which people try to get shmaterial objects close to each other, but they will fail for a variety of reasons; as in the previous examples, there need be no mysterious force preventing shmaterial objects from getting close to each other. Of course, there will be worlds in which people succeed in getting what otherwise would have been shmaterial objects closer than 5 meters of each other; such objects will fail to be shmaterial precisely because they have been brought in such close proximity.

Zimmerman's argument is based on the claim that closed material objects would require mysterious forces to keep them apart, "mysterious" in the sense that such forces would be present in *every possible world* where objects of certain shapes interact. Ordinary modal thought requires that there be no strictly necessary connections between the existence of repulsive forces and the shapes of the objects repelled. Zimmerman asks Zimmerman (1996, p. 12):

> …why should a certain shape of extended object be necessarily such that objects of that shape possess special repulsive powers? Is it not at least possible for there to be completely inert substances of any shape and size you like?

But in light of the above examples, any puzzlement here would now appear to be misguided. Any worlds in which we push extended closed objects together must satisfy a variety of constraints. *Material objects*, as the phrase is being understood by Zimmerman, cannot interpenetrate — interpenetrating things would not count as material objects. Material closed objects, therefore, by definition are always separated by some non-zero distance. There are a variety of worlds that satisfy these constraints. In some, certain closed material objects repel each other in various ways that prevent their contact. In others, material objects rearrange their parts at their borders, disappear, or mysteriously relocate when pushed together. In others, material objects simply happen never to come near each other.

Notice that there will be other worlds containing objects that, when pushed together, simply pass through each other. These objects will not count as material, under the current definition; but there seems to be no reason to reject

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[6]I thank Earl Conee for drawing my attention to the parallel with time travel.

their possibility. Logic alone will not prevent interpenetration![7] And notice that this possibility exists whether the objects are open or closed. Zimmerman seems to think that the need for "repulsive powers" would exist only in the case of two closed material objects, but the questions we are asking about closed objects — "what is keeping these objects apart?" — are just as pressing for objects whose boundaries mesh. When a closed object moves toward a partially open one, there is a final moment such that if the objects move any closer, they will fail the definition of a material object, namely, the moment at which they are separated by zero distance but do not interpenetrate. In this, the case is unlike that of two closed objects, in which there is no shortest separation consistent with their materialness. But if the objects do not interpenetrate, we may still ask what keeps the closed object from moving right through the partially open one. It does not help to appeal to their being material objects; in virtue of what do they satisfy the definition? Perhaps the world in question has laws which prevent interpenetration, or perhaps it has no laws at all, and it just happens by chance that such objects do not interpenetrate.

Accepting the possibility of extended material objects, therefore, does not require an implausible postulation of repulsive forces necessarily keyed to certain shapes of objects. The full range of possibilities involving repulsive forces or their lack may be accepted, for objects of any shape. Our use of 'material object' restricts our attention to a subset of those possibilities, but the others remain.[8]

We do not believe actual material objects to be continuous extended aggregates of simples, but there are plausible principles that drive us to accept the possibility of these objects. Worlds with these objects, whether the objects

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[7]It might be objected that coincidence would be metaphysically impossible if a certain metaphysics of objects is true: the view that identifies objects with regions of spacetime. But this would be a mistake. It is correct that on this view, no region of spacetime could *exactly* contain two distinct objects, because no region is identical to two distinct regions. But two overlapping spacetime regions could be considered the trajectories of distinct objects that pass through each other; the region of overlap would contain a single temporal part common to both objects.

[8]I have spoken as if Zimmerman's definition of a material object requires merely that material objects *do not* penetrate each other, whereas in fact his idea is that the concept of a material object requires that material objects *cannot* penetrate each other. But essentially the same response holds even when the definition is strengthened. In brief, the reason is this: if 'cannot' bears a nomological sense then 'material object' is simply being reserved for objects that inhabit worlds with certain sorts of laws; if the sense has the force of metaphysical modality, then 'material object' is simply being used for objects with a certain sort of essence.

are open or closed, will have accompanying laws or coincidences that result in their non-interpenetration. But these results should not lead us to reject the possibility of these objects, and thus of the principles that tell us of this possibility. The results stem from our decision to use 'material object' in a certain way.

References

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