There might be nothing: the subtraction argument improved

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1. The nihilist thesis that it is metaphysically possible that there is nothing, in the sense that there are no *concrete* objects, has been denied by philosophers like Armstrong (1989), Lewis (1986) and Lowe (1996). Van Inwagen (1996), although he has not denied it, has argued that it is as improbable as anything may be. In a recent paper Thomas Baldwin (1996) presents and defends what he calls the *subtraction argument*, designed to establish the nihilist thesis. When defending the first premiss of his argument, Baldwin introduces failure to satisfy the identity of indiscernibles as the 'mark of concreteness'. He uses this to disqualify as concrete sets whose members or ur-elements are concrete. Such disqualification must be made somehow; otherwise, as will be made clear below, the first premiss of Baldwin's argument collapses. But, as I shall argue below, Baldwin's first premiss does indeed collapse. I shall then present another version of the subtraction argument which is free from difficulties, and whose premisses stand firm. But let me start by summarizing Baldwin's argument.

2. Baldwin's subtraction argument consists of the following three premisses:

(A1) There might be a world with a finite domain of concrete objects.
(A2) These concrete objects are, each of them, things which might not exist.
(A3) The non-existence of any one of these things does not necessitate the existence of any other such things.

Given these premisses Baldwin (1996: 232) argues as follows: By (A1) there is a possible world w_1, accessible from the actual one, with a finite domain of concrete objects. Pick any member x_1 of that domain: by (A2) there is a world w_2, accessible from w_1, exactly like w_1 except that it lacks x_1 and any other things whose non-existence is implied by that of x_1. By (A3) w_2's domain of concrete objects is smaller than w_1's. This procedure of subtraction can then be iterated until one gets a world w_{min} whose domain of concrete objects consists of one or more objects such that the non-existence of one implies the non-existence of all. By (A2) the non-existence of each of these objects is possible, so there is a world w_{nil} whose domain lacks all those objects in the domain of w_{min}. But since by (A3) the non-existence of these things does not require the existence of anything else, w_{nil} is a world in which there are no concrete objects at all. If accessibility is taken to be transitive, then w_{nil} is accessible from the actual world and therefore it is a possibility that there are no concrete objects.

Baldwin then proceeds to give support for the premisses. He notes that unit sets may be troublesome, since some (David Lewis (1986: 84) for example) have thought that they are concrete if their members are. But allowing unit sets to be concrete objects would make (A1) collapse by generating an infinity of concrete objects, through indefinite iteration, in any world in which there are any. But Baldwin thinks they can be excluded from the domain of concrete objects because they do satisfy the identity of indiscernibles, failure to satisfy which he adopts as the mark of concreteness. This, he says, is connected with the criterion of spatiotemporal location via the assumption that space-time provides a way to distinguish exactly similar objects. So, according to Baldwin, concrete objects are those which fail to satisfy the identity of indiscernibles and can be distinguished by their spatiotemporal location.

Thus, Baldwin says, the first premiss of the subtraction argument looks reasonable. For to reject it one must hold that there *has* to be an infinite domain of concrete objects, which is certainly unreasonable. And trying to substantiate the unreasonable thesis that there has to be an infinite domain of objects by appealing to the infinite divisibility of space-time is useless since, Baldwin says, regions of space-time do not count as concrete by the identity of indiscernibles test, for space-time regions cannot be distinguished by appeal to spatiotemporal location. But, as I shall argue below, Baldwin fails to substantiate the first premiss of the subtraction argument, and this for two reasons: (a) his mark of concreteness fails to exclude both the problematic sets and spatiotemporal points from the domain of concrete objects and (b) (A1) is undermined by considerations having to do with the parts of spatiotemporal objects.

In defence of (A2) Baldwin constructs an argument with the following three premisses:

(B1) It is a mark of concrete objects that they do not satisfy the identity of indiscernibles. So the identity of a concrete object is not determined by the intrinsic properties which determine what kind of thing it is.

(B2) In the case of any being whose existence is necessary, the fact that its existence is necessary is determined by the kind of thing it is, and thus by its intrinsic properties.

(B3) For any being whose existence is necessary, the intrinsic properties which determine its existence also determine its identity.

These three premisses imply that there cannot be a concrete necessary being. (B1) states Baldwin's mark of concreteness and (B2), Baldwin says, is uncontentious. In favour of (B3) Baldwin says that the only familiar argument for a necessary being of this kind, namely the Ontological Argument, invokes a property, perfection, that implies uniqueness if it implies existence. And although Baldwin does not see how to generalize from the case of God to a general defence of (B3), given the familiar connection between existence and identity, (B3) looks reasonable to him.

Baldwin supports (A3) by showing that non-existence is not the kind of predicate that provides counterexamples to the following fallacious scheme:

(C) $(\forall x)\Diamond(Fx) \vdash \Diamond(\forall x)(Fx)$

For although the subtraction argument is not just an instance of this schema, if non-existence were a predicate counterexemplifying this schema, this would suggest that (A3) is wrong. But, Baldwin shows, non-existence does not have the characteristics of the predicates that constitute counterexamples to (C).

So much for Baldwin's subtraction argument. I think he has given reasonable support to his premisses (A2) and (A3). However, the argument fails to prove nihilism, since, as I shall show, (A1) has not been adequately supported.

3. Baldwin regards failure to satisfy the identity of indiscernibles as the mark of concreteness. Now, as is well known, the thesis of the identity of indiscernibles comes in different versions depending on what kind of properties (e.g. only intrinsic, or intrinsic and relational) it denies can be shared in their totality by different things. Baldwin does not explicitly say which version of the thesis he has in mind, but it is clear from many parts of his text (the premisses (B1)–(B3), for example) that he has in mind the strongest version, i.e. that according to which no two things can share all their intrinsic properties.

Why does Baldwin think that this version of the identity of indiscernibles is enough to stop unit sets of concrete objects being concrete? Here is what he says:

> they [unit sets] do satisfy the identity of indiscernibles since the identity of the member of a unit set is an intrinsic property of the set which also determines its identity. Even though there can be two exactly similar physical objects, x_1 and x_2, the unit sets $\{x_1\}$ and $\{x_2\}$ are not in the same way exactly similar since they have different intrinsic properties. (1996: 233)

I think this argument is wrong. First, we must ask how the *identity* of the *member* can be a property, whether intrinsic or not, of the *set*, without set and member being identical? Surely, what Baldwin means is that the property of *having* x_1 *as its only member* determines the identity of $\{x_1\}$. And it does, but is this an intrinsic property? No, it is a *relational* property, not merely because it is expressed by a relational predicate, but because it essentially involves another particular, namely x_1. And, if x_1 and x_2 are indiscernible, no properties distinguish $\{x_1\}$ and $\{x_2\}$ except properties involving x_1 and x_2. So these sets fail to satisfy Baldwin's version of the identity of indiscernibles. But then sets with concrete members are concrete, thereby falsifying premiss (A1) of the subtraction argument.

Note, moreover, that even granting Baldwin that the property of *having* x_1 *as its only member* is an intrinsic property of $\{x_1\}$ does not give him what he needs. For if *having* x_1 *as its only member* is intrinsic, then so, surely, is x_1's property of *being the only member of* $\{x_1\}$. But if *being the only member of* $\{x_1\}$ is intrinsic then the concrete objects x_1 and x_2 (and any other possible pair of concrete objects) *do* satisfy the identity of indiscernibles, thus failing to satisfy Baldwin's mark of concreteness! In short, Baldwin's mark of concreteness either makes unit sets concrete, thereby falsifying premiss (A1), or else makes it impossible *not* to satisfy the identity of indiscernibles.

4. Assuming that space-time is dense, space-time regions are such that if one exists, then there are infinitely many of them – namely the parts of that region. Baldwin tries to stop these regions counting as concrete objects by appealing to a connection between failure to satisfy the identity of indiscernibles and having spatiotemporal location. Although he does not make the connection completely clear, he gives some indication of it by saying that the mark of concreteness is connected with the 'familiar criterion of spatiotemporal locatedness via the assumption that space-time provides a way of distinguishing exactly similar objects' (1996: 233). This assumption is *very* controversial. For consider Max Black's (1976: 253) world which consists only of two exactly similar iron spheres being at some distance from each other. Here space-time provides a way of distinguishing the spheres provided it is absolute and so there is, independently of the spheres, some region A that one of the spheres occupies and the other does not. But if there is nothing to space-time but the spatiotemporal relations of objects, then the two spheres cannot be distinguished by space-time, as each bears the same spatiotemporal relations to a sphere with such-and-such properties. Baldwin's argument for nihilism thus depends on an absolute view of space-time and is therefore at least as controversial as that view.

Surely, we should disconnect failure to satisfy the identity of indiscernibles as the mark of concreteness from the claim that spatiotemporal location is sufficient to distinguish concrete objects. But even if we give up the latter and claim only that concrete objects are those which fail to satisfy the identity of indiscernibles, Baldwin's position is still not good. For regions are sets of space-time points; so let us ask, does Baldwin's mark of concreteness stops space-time points being concrete? It seems not, as space-time points are indiscernible in the relevant respect. For how do two space-time points differ if not because of their spatiotemporal relations either to other points or to the occupants of space-time? In no way: if one neglects those relations, then every two space-time points are exactly alike, and so, by Baldwin's mark of concreteness, are concrete. But if there are any regions of space-time at all, there are infinitely many space-time points, which undermines Baldwin's premiss (A1).

5. There is another threat undermining Baldwin's premiss (A1), which he does not consider. For the parts of a concrete object *x* are at least as concrete as *x* itself. But every such object *x* that occupies a space-time region has infinitely many parts, each of them occupying some of the infinitely many regions included in the region *x* occupies. Thus, if there is one spatiotemporally extended concrete object, there are infinitely many.[1] So if such a concrete object exists, infinitely many concrete objects exist. But no appeal to Baldwin's mark of concreteness will avoid this infinity of concrete objects.

6. But these problems with the subtraction argument do not mean that we should abandon nihilism. I shall now present a version of the subtraction argument that is free from the difficulties above.

First I need the notion of objects that are *maximal occupants* of connected spatiotemporal regions, such as a whole brick as opposed to its parts. A region A is connected if and only if every two points in A can be joined by a path of points in A and disconnected if and only if it is not connected. Let us say that *x* is a maximal occupant of a connected region if and only if *x* occupies a connected region and for all *y*, if *x* is a part of *y* then *y* is scattered, where a scattered object is one occupying a disconnected region. An isolated brick, e.g. one which is not a part of a wall, is a maximal occupant of a connected region and, since it is not scattered, its parts are not maximal occupants of connected regions.

Now let us call *x* concrete* if and only if *x* is concrete, memberless and a maximal occupant of a connected region. Then the following version of

[1] This argument is inspired by Cartwright (1987: 177–78).

the subtraction argument, *the subtraction argument**, proves nihilism nicely:

(A1*) There might be a world with a finite domain of concrete* objects.
(A2*) These objects are, each of them, things which might not exist.
(A3*) The non-existence of any one of these things does not necessitate the existence of any other such things.

The reasoning from these premisses to the nihilist conclusion is similar to that of the subtraction argument. We start from a possible world w_1, accessible from the actual one, with a finite domain of concrete* objects and then, after picking any of its concrete* members x_1, we remove it completely, i.e. we remove x_1 and *all* its parts, and pass to a possible world w_2 exactly like w_1 except that x_1 has been removed completely. Thus w_2 lacks not only x_1 and its parts, but also anything whose non-existence is implied by that of x_1. We repeat this procedure until we arrive at a world w_{nil} in which there are no concrete* objects. With accessibility transitive, w_{nil} is a metaphysical possibility. But if in w_{nil} there are no concrete* objects, then in w_{nil} there are no concrete objects at all, or so I shall argue.[2]

7. (A1*), unlike (A1), is compatible with concrete objects having infinitely many parts, which, as we saw above, implies that any world with any concrete object has infinitely many such objects. (A1*) requires only that the number of maximal occupants of connected regions might be finite. And, clearly, in w_{nil} there are no spatiotemporal objects; for a world with no maximal occupants of connected regions is a world with no occupants of regions, and therefore with no spatiotemporal objects. (A1*), unlike (A1), is compatible with the hypothesis that sets with concrete members are concrete, which implies that any world with any concrete object has infinitely many of them. (A1*) requires only that the number of concrete* objects, which are *memberless* concrete, might be finite. And, clearly, in w_{nil} there are no sets with concrete members (or ur-elements), as the non-existence of the latter implies that of the former.

Furthermore, if space-time is relational, there is no space-time in w_{nil}, as there are no spatiotemporal objects. But what if, after all, space-time is

[2] One difference between my argument and Baldwin's is the following: while in the subtraction argument every world in the series $w_1, w_2, \ldots, w_{min}, w_{nil}$, has a domain of concrete objects smaller than that of its predecessor, this is not case in the series of worlds of the subtraction argument*, in which, although every world has a domain of *concrete** objects smaller than that of its predecessors, the only world having a domain of concrete objects smaller than that of its predecessor is w_{nil}: for in every world other than w_{nil} the domain of concrete objects is infinite.

absolute? Space-time points, as we saw, fail to satisfy the identity of indiscernibles and therefore count as concrete, if that is the mark of concreteness. Fortunately, one can still retain the substance of Baldwin's mark of concreteness and rule out space-time points from the domain of concreteness. For what are the intrinsic properties of space-time points? They have no shape, no size, no temperature, no mass. Indeed they seem to have no intrinsic properties, and so we can claim that the mark of concreteness is *non-vacuous* failure to satisfy the identity of indiscernibles. In other words, *K*s are concrete if and only if *K*s *have* intrinsic properties and there is some possible world in which at least two K*s* share all their intrinsic properties. Space-time points are not concrete by this criterion.

What about space-time regions? For, although they are sets of spacetime points, they appear to have intrinsic properties – e.g. shape and size – which they can share in their totality. But here we can appeal to the uncontentious thesis that, whether or not sets with concrete members are concrete, sets of abstract (i.e. non-concrete) objects, like space-time points, are themselves abstract. And then we can say that non-vacuous failure to satisfy the identity of indiscernibles is not the *mark* of, i.e. necessary and sufficient for, concreteness, but just *necessary* for it. This, while still ruling out space-time points as concrete objects, does not rule in space-time regions, and allows any apparent examples of abstract objects which fail to satisfy (non-vacuously) the identity of indiscernibles. Furthermore, it still stops God and the null set, both of which, if they exist, do so necessarily, being concrete. For arguably God has intrinsic properties and cannot but satisfy the identity of indiscernibles. And though it is not clear whether the null set has any intrinsic properties, it is not concrete if it has none, nor is it concrete in case it has any, because there cannot be more than one null set. Thus, it seems, there are no concrete objects in w_{nil}.

(A1*) is thus much firmer than (A1). To reject it, one has to hold the unreasonable hypothesis that there *has* to be an infinite domain of concrete* objects. And one can support (A2*) by replacing (B1) by (B1*) below and argue, essentially like Baldwin, from (B1*), (B2) and (B3) to the impossibility of a concrete* necessary being.

(B1*) It is a necessary condition of concrete objects, and therefore of concrete* ones, that they non-vacuously fail to satisfy the identity of indiscernibles. So the identity of a concrete* object is not determined by the intrinsic properties which determine what kind of thing it is.

So (A2*) looks as reasonable as (A2). And, of course, (A3*) is supported by the considerations Baldwin used to support (A3). The subtraction argument*, unlike the subtraction argument, has *all* its premisses well supported. Nihilism stands now firmer than before.[3]

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References

Armstrong, D. 1989. *A Combinatorial Theory of Possibility.* Cambridge: Cambridge University Press.

Baldwin, T. 1996. There might be nothing. *Analysis* 56: 231–38.

Black, M. 1976. The identity of indiscernibles. In *Universals and Particulars: Readings in Ontology*, ed. M. Loux, 250–62. Notre Dame and London: University of Notre Dame Press.

Cartwright, R. 1987. Scattered objects. In his *Philosophical Essays*, 171–86. Cambridge, Mass.: MIT Press.

Lewis, D. 1986. *On the Plurality of Worlds*. Oxford: Blackwell.

Lowe, E. J. 1996. Why is there anything at all? *Aristotelian Society Supplementary Volume* 70: 111–20.

van Inwagen, P. 1996. Why is there anything at all? *Aristotelian Society Supplementary Volume* 70: 95–110.

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