Ordinary Objects in a Pointillist Universe

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An ordinary entity such as a tree *boils down to* a great many tiny things; and what it is for something to be *part of* that tree is just for it to be one of those tiny things, or a group of them. But there is a problem with this pair of claims.

Suppose you have an electron, a proton, and a tree in front of you, and assume for the sake of illustration that electrons and quarks are simples and protons are groups of three quarks. The electron is a single dot; 'is an electron' is directly true of the dot. The proton is a group of three dots; 'is a proton' is directly true of the plurality of three dots. But the tree isn't either a single dot or a group of dots; 'is a tree' isn't directly true of either a single dot or a group of dots. Wherever you have a tree, you have zillions of groups of dots that are equally good candidates for being a tree—but there is just one tree there. So, it appears that none of those groups of dots is literally a tree. But if the material universe consists of dots, then how do trees fit in?

In this paper I explore the idea that the term 'is a tree' applies to reality in a way different from how 'is an electron' and 'is a proton' apply to reality. When pursued properly, we end up with a theory, Plurality Pointillism, that contains a whiff of the idea that trees are "less real" than the tiny entities—almost non-existent.

On my theory, if trees exist, then although each one "boils down to" pluralities of pluralities of dots, it isn't identical, or even "identical-light", to any plurality of dots, any plurality of pluralities of dots, etc. In addition, dots need not be simples and there need not be any simples at all. The notion of parthood, and thus composition, is revealed to be much less philosophically important than metaphysicians have thought. Roughly put, 'x is a part of y', 'the xs compose y', and 'x is a simple' *don't matter to ontology*; only 'x is one of plurality y' matters. As hinted at above, one of my theory's intriguing features is the thesis that 'is an F' can apply to reality even though no *entity* is F, in one natural sense of 'entity'. It also suggests that our commonsensical claims about reality can be true even if there no entities at all. We may live in a world of pure smoke.

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1. Pluralities

I'm using 'plurality' in the familiar way so that *what it is* for "the plurality of x1 and x2" to exist is exactly this: x1 exists, x2 exists, and x1 ≠ x2. The plurality of x1 and x2 is *two* things, and each thing can be either concrete or non-concrete. An object is an "element" of plurality p $=_{df}$ it's one of p. I don't offer any analysis of 'x is one of y'.

A plurality of wholly physical objects is a wholly physical object—albeit a plural object. Hence, it's not a *set*, if a set is something neither spatial nor temporal.

I'm not saying that the two things x1 and x2 are *parts* of the plurality of x1 and x2. We have yet to say anything about parthood, composition, or fusion. Everything I say about pluralities is consistent with the thesis that there are no proper parts whatsoever.

The notion of there being many individual pluralities is familiar. There are the red chairs in room 101; that's one plurality (assuming there are chairs). There are the blue chairs in 101; that's another plurality. Each plurality is *a* plurality; the use of 'a' indicates an individual, single thing—although the thing in question is a plurality. Or consider how physicists talk about entangled pairs in quantum theory: 'Here is an entangled *singlet* pair of electrons', etc.

Some authors use 'plurality' in such a way that even a single object falls into the extension of 'plurality'; they do not adopt my definition that restricts 'plurality' to groups of at least two things. In response, I agree that one thing can be a plurality. In fact, in the previous paragraph I claimed that for every x, if x is a plurality, then x is one thing (and, again, this is not to say that x is a composite; we have yet to say anything about composition). But under the assumption that there are mereological simples, I reject the claim that for every x, if x is one thing, then x is a plurality. For simple s, none of these are true: 's is a plurality', 's is a multiplicity', 's is a group', etc. There might be some theoretical conveniences associated with using 'plurality' in such a way that s falls into the extension, but theoretical convenience has to be handled carefully. For comparison, it might be theoretically convenient to use 'parent' so that someone with zero or more children is a "parent". But 'Everyone is a parent' is false. To get the convenience we use 'Everyone is a parent*', with an appropriate definition. Similarly, although 's is a plurality' is false (just as 'John is a parent with no children' is false), with the appropriate definition 's is a plurality*' can be theoretically convenient and true.

There are many interesting issues to explore regarding the ontology of pluralities as well as the linguistic characteristics of strings such as 'the plurality of marbles' and 'the marbles in the corner'. In the interests of brevity and focus I aim to avoid as many of these issues as possible.

I will not need to say anything about plural quantification either. We will see in the following section that there may be possible worlds in which there are multiple physical objects but no physical non-pluralities. When we talk about the individual physical aspects of such a world, our quantificatory uses of 'there is' and 'there are' range over pluralities alone, since there is nothing else physical in that world for them to range over. Hence, quantificatory uses of 'there is' can range over pluralities; they merely grab them *as singular objects*, as discussed above.

2. Categories of Pluralities

On Plurality Pointillism, the existence of trees "comes from" pluralities of pluralities. But the relation is stranger than expected. In order to see this, we need to make some distinctions amongst pluralities.

There are exactly three logical possibilities for a given plurality P: P is a plurality of non-pluralities alone, P is a plurality of pluralities alone, or P is a mixed case, with some elements pluralities and some non-pluralities. If even one of P's elements E is a plurality, we can ask whether E's elements are all pluralities, all non-pluralities, or some of both. The question repeats each time there is a plurality: are its elements all pluralities, all non-pluralities, or some of both?

For any plurality P, then, P may or may not *bottom out*, which happens when and only when either all of P's elements are non-pluralities or the above process of questioning always ends with the answer 'all the elements are non-pluralities'. Let's say that each element of plurality P is a *1-element of P*, each element of each element of P is a *2-element of P*, each element of each element of each element of P is a *3-element of P*, etc. X is an *or-element of plurality P* $=_{df}$ X is either a 1-element of P, or a 2-element of P, or a 3-element of P, etc. P bottoms out if and only if there is an integer m such that there are no m-elements of P (which entails that there are no (m + n)-elements for non-negative integer n, since there can't be a (m + 1)-element without an m-element). So, P does *not* bottom out just in case, intuitively, the cascade of elements goes on infinitely, without coming to an end.

If P bottoms out, we say that its *bottom* is nothing but the non-pluralities revealed through the questioning process. This is not to say that all its or-elements are non-pluralities. For instance, consider the three-element plurality P_N of (1) the plurality of positive integers, (2) the number 0, and (3) the plurality of negative integers. Assume for illustration that integers are non-pluralities. Then P_N's bottom consists of all the integers, all of which are non-pluralities, but P_N has two elements that are pluralities (viz. elements (1) and (3)).

For some purposes, we consider only pluralities that do not have any "repeats" amongst their or-elements: each thing can "show up" in the plurality only once (as a single 1-element, a single 2-element, etc.). For instance, the plurality of Tom, Dick, Harry, and Harry has repeats, as does the plurality of Tom, Dick, and the plurality of Harry and Tom. Pluralities that have a decent chance at being identical with ordinary physical objects have no repeats.

If P does not bottom out, and no object shows up more than once in P, then the plurality of all the or-elements of P has infinitely many elements (since the cascade is infinite and has no repeats). But the plurality of all the or-elements of P may be infinite even if P *does* bottom out, provided that for some positive integer m, there are infinitely many m-elements of P. For instance, consider again the three-element plurality P_N a couple paragraphs back: it has infinitely many or-elements but it bottoms out as well. Therefore, ‘P doesn’t bottom out’ entails ‘P has infinitely many or-elements’ (assuming no repeats), but not vice versa.

X is a ***bottom plurality, BP*** $=_{df}$ X is a plurality with a bottom (of non-pluralities, but that’s redundant).

X is a ***pure BP*** $=_{df}$ there are some non-pluralities such that X is the plurality of just them.

X is an ***impure BP*** $=_{df}$ X is a BP with at least one plurality as an element. Each impure BP corresponds to a pure BP: the plurality of non-pluralities that are its bottom.

X is a ***bottomless plurality, BLP*** $=_{df}$ X is a plurality with no bottom.

X is a ***pure BLP*** $=_{df}$ X is a plurality each of whose or-elements is a plurality. So, each element of X is a plurality, each element of each element of X is a plurality, etc. It is pluralities “all the way down”.

X is an ***impure BLP*** $=_{df}$ X is a pure BLP with the sole exception of having at least one or-element that is a non-plurality. Every impure BLP is a pure BLP with at least one non-plurality added and nothing subtracted.

You might think BLPs are metaphysically impossible. I address that objection below.

These definitions are more complicated than they may appear because identity for pluralities is puzzling. Suppose integers exist and ask whether the following pluralities are mutually distinct:

P1: the plurality of 1, 2, and the plurality of 3, 4, and 5
P2: the plurality of 1, 2, 3, and the plurality of 4 and 5
P3: the plurality of 1, 3, 5 and the plurality of 2 and 4

It is usually thought that in general, pluralities A and B are identical just in case for any x, x is one of A iff x is one of B. This conception of plurality identity doesn’t answer our question about the identity relations amongst P1-P3, however, because for example it isn’t clear that the number 4 isn’t *one of* each of P1-P3. If the plurality of 4 and 5 *just is* the numbers 4 and 5—which it surely is—then it appears as though P2 has five elements. One might object, ‘But P2 has *four* elements: 1, 2, 3, and the *single* object that is the plurality of 4 and 5’. That’s right! But one should be forgiven for thinking that that “single” object *also* is two objects. In the description ‘the plurality of 1, 2, 3, and the plurality of 4 and 5’, the term ‘the plurality of 4 and 5’ picks out two things; so, the description is a description of a plurality of five things. The plurality of 4 and 5 is both one thing—one plurality—and two things, 4 and 5. Or so it might be thought.

If P1-P3 are really the very same plurality, then all impure BPs are pure BPs, so that the two categories aren’t mutually exclusive, contrary to appearances. To see this, consider P2, which has as an element the plurality of 4 and 5. Because of that, it is impure. But if P1-P3 are identical, then P2 is identical with the plurality of 1-5. Hence, it is pure as well, assuming for illustration that integers aren’t pluralities. Similarly, although P_N has *exactly three* 1-elements, it also has *infinitely* many 1-elements—and since there is no contradiction there, we need to be more careful in understanding the logical form of the relevant sentences.

In order to keep this paper manageable, I won't comment on or make assumptions regarding this issue of the distinctness of P1-P3, since it won't matter for my purposes. No matter where one stands on that issue, we can agree that each of P1-P3 *boils down to* the plurality of 1-5. In general, pluralities A and B bottom out into the same non-pluralities means that they bottom out into *the plurality of* those entities.

In order to get a handle on BLPs, consider object D.

> First you see what looks like a dot D, with nothing whatsoever around it. It looks like it's a single, unified, non-plural, thing floating all by itself in empty space. Then you look closer and D starts to look fuzzy around the edges as well as throughout the inside. Then you look even closer, shrinking yourself in size, and you realize what appeared to be a dot is really just an enormous number of much smaller dots with lots of space between them (a bit like our solar system). So the big dot D has "dissolved" into a great number of smaller scattered dots.
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> Next, you zoom in on one of the smaller dots that are included in the D plurality you just discovered and the same thing happens: first it's fuzzy, and then you see that it's really just an enormous number of tiny dots. And then it happens again, for *every single dot*: every time you focus in on what seems to be a dot you realize that it's just a bunch of much, much smaller "dots", all of which dissolve into further "dots", all of which dissolve into further "dots", ad infinitum. That is, there is no bottom: it's *infinitely* descending. So we have concluded that D is a plurality of just pluralities of just pluralities of …. But there is no bottom.

Objects like D are *infinitely descending all-pluralities*: pluralities of just pluralities of just pluralities of just pluralities … with no end. D is a pure BLP.

A universe in which *everything* is like D is one in which there are no non-pluralities. A universe of nothing other than pure BLPs is one without building blocks that fail to have building blocks (that is, that universe does have building blocks, but all those building blocks have building blocks, the latter building blocks have their own building blocks, etc.). For comparison, philosophers have wondered whether there are possible worlds in which every object is *gunky*: it has proper parts, each of whose parts has proper parts, each of those parts have proper parts, et cetera (Lewis 1991). But a pure BLP world is potentially different, for I have yet to say anything about parthood: I have not said—and it's hardly obvious—that pure BLPs have parts. Suppose that both of the following are true in the world W of my thought experiment involving D: (i) W is metaphysically possible with respect to our world, and (ii) in W none of the dots (which exhaust the physical occupants of W) are unified in any way strong enough for parthood to occur, so in W parthood never happens at all in the physical world (set aside any non-physical objects in W). It follows from (i)-(ii) that it's metaphysically possible for there to be *a physically non-empty world in which there are no physical* *composites or physical simples*, granting the plausible assumption that it's necessary that simples aren't pluralities (where, again, pluralities are groups of at least two things).[2]

Set aside the secondary point about composition. One might think that BLPs are metaphysically impossible because infinitely descending pluralities are impossible. However, by my lights anyway there is no good evidence against the claim 'It is metaphysically possible that there are material objects but they don't *all* boil down to nothing but non-pluralities'. We should *make room* for the metaphysical possibility of BLPs in our Pointillist ontology (or any other plausible ontology, for that matter). In what follows I will assume that such a world is possible and needs to be accounted for in the true modally strong story of parthood and composition.

A universe might contain *both* BPs and BLPs; it's not as though a universe can't have both. Object x1 boils down to non-pluralities alone, so it's a BP. Object x2 is exactly like D above: a pure BLP. Object x3 is just like D but with this exception: while looking into its innards one occasionally comes across a non-plurality even though the descent of pluralities goes on infinitely. It's an impure BLP.

3. Non-Pluralities

As far as non-pluralities go, the plurality pointillist holds that some of them are pretty much what you pictured in your mind when you pictured a mereological simple. The *definition* of 'non-plurality' is, of course, parasitic on the definition of 'plurality': x is a non-plurality $=_{df}$ x exists but is not more than one thing. The *intuitive* notion of a simple is this: something that does not have or involve or include, in any reasonable ontological sense, any multiplicity of entities; when you dig anywhere into its innards—if it has any spatial or temporal innards to dig into—you will discover no more entities; it's a bit of homogeneous goo when it comes to entity-hood. As I said, that's not a definition. It's the *picture* we have in our minds when thinking about parthood and multiplicity. I take this intuitive notion as a conceptual primitive and use 'simple' to indicate non-pluralities that fit that picture. I do not use 'is a part of' in the characterization; parthood comes later. In the next section I argue that trees are non-pluralities but are not simples either since they obviously include multiple entities. Hence, not all non-pluralities are simples.

4. What Trees Are Not

Suppose 'There is an x that is F' is true. There are exactly two options for the things that make it true: a non-plurality that's F, or a plurality that is collectively F. Some philosophers have argued against the many-one identity of (say) a tree and a plurality. Those arguments are controversial, to say the least (cf. the papers in Baxter and Cotnoir 2014). In this section I give *original* reasons to think that no plurality satisfies

[2] Then again, if universalism about composition is false, then a plurality of two simples does seem to lack parts if they have no interesting physical relation to one another (e.g. suppose they are electrons forever separated by a billion light years). So maybe such pluralities are mereological simples, contrary to what was asserted above. Even so, they aren't simples in the sense indicated in the next section and used throughout.

'is a tree'. The only remaining, and thus correct, option—that a non-plurality satisfies 'is a tree'—will be addressed in the next section.

Suppose that one thinks that plurality P is an excellent candidate for being identical to the tree in my backyard, T. So, one is thinking that P might be *identical* to T. The main reason one thinks P is T, presumably, is that one thinks T and P are materially coincident in this sense: the spatiotemporal volume and material collectively taken up by the or-elements of P is precisely the same as that for T. In what follows I will rule out, in order, the identity of T with a plurality from any of the four exhaustive categories of pluralities: (1) impure BPs, (2) BLPs, (3) pure BPs that bottom out in just simples (call them *pure/simple BPs*), and (4) pure BPs that do not bottom out in just simples (so their bottoms contain at least some non-pluralities that aren't simples).

Option (1): T = P and P is an impure BP. Since P is an *impure* BP, at least one of P's 1-elements is a plurality. Since P is a BP, P has a bottom, which by definition is a plurality P* of just non-pluralities. P* is a pure BP, by definition. Hence, corresponding to an impure BP P there is a pure BP P* that is materially coincident with P in the sense articulated above. There are two cases to consider: P = P* and P ≠ P* (recall that we saw earlier that there are reasons for thinking impure BP P is identical with pure BP P*).

If P = P*, then the supposition that T is identical with an impure BP is equivalent to the supposition that T is identical with a pure BP. I will examine that possibility below (since it's the disjunction of categories/options (3) and (4)).

If P ≠ P*, then P and P* seem to be equally good candidates for being identical with T, at least when it comes to spatiotemporal and material fit. I claim that there is no good reason to think T is the impure BP P instead of the pure BP P*; hence, T ≠ P. In saying that T ≠ P, I am *not* saying that T = P*. After all, it's highly reasonable to think that nothing could make it the case that T is identical with just one of them. All I'm saying is this: if P ≠ P* (so T can't be identical with *both* P and P*), then T ≠ P. For the sake of illustration, suppose P is the plurality of s_1, s_2, … , s_N, and the plurality of s_{N+1}-s_{N+5}, where N is around 10^{30}; and P* is the plurality of s_1-s_{N+5}. So P has $10^{30} + 1$ 1-elements whereas P* has $10^{30} + 5$ 1-elements (but they have the same bottom). All I'm saying is this: if P and P* are distinct, then it would be foolish to identify the tree T with P. Hence, if an impure BP is distinct from the plurality of its bottom (i.e. P ≠ P*), then it's not identical with T.

The theses of the last two paragraphs—$[(T = P \ \& \ P = P^*) \supset T = P^*] \ \& \ [(T = P \ \& \ P \neq P^*) \supset T \neq P)]$—entail this result: $T = P \supset T = P^*$. That is, if T is an impure BP, then it's a pure BP; T is a pure BP if it's a BP at all.

Options (2) & (3): T = P and P is either a BLP or a pure/simple BP. Any BLP that has a reasonable chance at being a tree will of course have infinitely many or-elements, since it will have no repeats. In addition, if a pure/simple BP is going to have a decent chance at being a tree, it will have an enormous number of simples as or-elements. For instance, in a typical tree you can find roughly 10^{30} molecules. So if you think plurality P—which we are now supposing is a BLP or a pure/simple BP—is a good candidate for T, then you will realize that P will have an enormous number of or-elements.

Unfortunately, you will also realize that given the existence of enormously-numbered P, there is an extremely similar plurality P* that is distinct from P but *just as good as* P as far as being an *excellent candidate* for "fitting" T perfectly. For instance, P* might contain all of P plus one more electron or microscopic dot that is, intuitively, on the border of T. The fact that trees are extremely large compared to dots, and trees are "vaguely composed", guarantees the existence of P* given the existence of P. And you then realize that given the existence of P*, there's no reason to think P but not P* is identical to T. And yet, T cannot be identical with both of them because by the transitivity of identity, then P would be identical with P*, which it plainly isn't (by design). In sum:

a) For all x, if x is a pure/simple BP or a BLP, then there exists a y such that x ≠ y, y is a pure/simple BP or a BLP, and y is as good a candidate as x is for being identical with the tree in my backyard.

b) For all x and y, if x and y are pure/simple BPs or BLPs, x ≠ y, and x and y are equally good candidates for being identical with the tree in my backyard, then x is identical with it iff y is identical with it.

c) For all x, y, and z, if x ≠ y, then it's not the case that both x = z and y = z.

d) Hence, by (a)-(c), there is no x such that x is a pure/simple BP or BLP and x is identical to the tree in my backyard.

In order to better understand the argument, think of a case in which a claim analogous to (a) is false. Take the definite description 'The most massive pure/simple BP in the lab apparatus' and assume that there are a great many pure/simple BPs in the lab apparatus, many of which include an enormous number of simples. Assuming that there are a great many almost entirely overlapping pure/simple BPs in the apparatus, there still is singular reference for 'The most massive pure/simple BP in the lab apparatus' because *even though there are many almost equally good reference candidates, the description has a term that singles one out as the best.* Hence, there exists a pure/simple BP P such that for any other pure/simple BP P*, P* is not as good a candidate as P is for being identical with the most massive pure/simple BP in the lab apparatus. That is, (a) is false when we substitute 'the most massive pure/simple BP in the lab apparatus' in for 'the tree in my backyard' (and we adopt the assumption about the lab apparatus containing a great many pure/simple BPs each of which includes an enormous number of simples).

Matters are otherwise when you have the scenario of having, for a given definite description D, not merely many *reasonably fitting* candidates for the referent of D but many candidates that are *equally fitting*—which is what happens when D doesn't include terms that eliminate all but one of the rival candidates. This is the case with 'The tree in my backyard' and reference candidates that are pure/simple BPs or BLPs: you don't have singular reference, so premise (a) is true. That is, in the vast sea of exceedingly similar treeish pure/simple BPs or BLPs in my backyard, the definite description 'The tree in my backyard' does not latch on to *just one* of them—and it doesn't do so because there is nothing in the description—such as 'most massive' in 'the most massive treeish pure/simple BP or BLP'—that could eliminate all but one of the reasonably equally good rivals, which needs to be done for singular reference to occur.

Or so many philosophers will think upon reflection! I'm *not* saying they are right, or that they are wrong. Whether one agrees with them depends in part on one's views on meaning determination. One might think that contrary to the considerations of the previous paragraph, ordinary natural language is magically discriminating so that 'The tree in my backyard' refers to just one treeish pure/simple BP or BLP despite the twin facts that there are a great many extremely similar treeish pluralities with enormous number of or-elements there and the description doesn't include anything such as 'most massive' that can single out one of them.

If the group of philosophers who accept (a) are correct, then my theory is thereby made more complicated. However, for the same reason I'm allowing for the metaphysical possibility of BLPs, I will also allow for the metaphysical possibility that natural language reference is not magically discriminating, so I will accept that in some metaphysically possible worlds (a) is true (I think (b) and (c) are less problematic). Below I will indicate what happens if (a) is metaphysically necessarily false. Call premise (a) ***Referential Sobriety***, since it is saying that reference for 'the tree in my backyard' isn't magical. Note that this claim is tied specifically to 'the tree in my backyard'; we get principles analogous to Referential Sobriety by substituting some other definite description in for 'the tree in my backyard'. The question of which definite descriptions can be truthfully substituted in will be addressed below.

Thus, given Referential Sobriety (premise (a)), the argument (a)-(d) helps show that T isn't identical with any BLP or pure/simple BP. So much for options (2) and (3).

Option (4): T = P and P is a pure BP that doesn't bottom out in just simples. This means that P has at least one non-simple, non-plurality amongst its elements. In order to escape the considerations that ruled out BLPs and pure/simple BPs—considerations having to do with vagueness, meaning determination, and the enormous number of or-elements in candidate pluralities for T—P can't have an enormous number of elements. So what might P be, to meet the twin requirements of (i) being a pure BP that has at least one non-simple element and (ii) being a reasonable candidate for T?

One might think that P's elements could be the tree's leaves plus the piece/hunk of wood that consists of all the tree's wood. Pretend that there are just four leaves on the tree; so P has five elements total. If one hasn't thought too much about the case, this might seem to be the most obvious way a tree could be a plurality. But the leaves could hardly be non-pluralities when the tree itself is, by hypothesis, a plurality: surely they are on a par when it comes to being or not being a plurality. So this kind of P won't work. I have been unable to think of any plausible way of filling out option (4).

Hence, I have argued that the tree T is not a plurality. Clearly, it's not a simple either. So, we have yet to figure out what might make 'There are trees' true, given that neither simples nor pluralities will do the trick.

5. The Four Theses of Plurality Pointillism

The term ‘is/are arranged tree-ish’ is true, in the actual world, of certain pluralities of tiny dots. I think it’s best to understand the term as applying to a *temporally extended* plurality (although one can proceed differently). For each moment the tree exists, take the temporally minimal temporal parts of some electrons and quarks that, intuitively, are collectively an excellent candidate for making up the tree at that moment; a plurality in the extension of ‘is/are arranged tree-ish’ is a plurality of the dots over the entire temporal length of the tree’s existence. There will be many such pluralities for each tree, due to borderline cases (as indicated with Referential Sobriety).

When ‘There is *one* tree in my backyard’ is true of a possible world, there are zillions of tree-ish pluralities in the appropriate backyard of that world. All those tree-ish pluralities are related to one another in a certain way—because there is a *single* tree there. For instance, any two of those pluralities are almost entirely “overlapping” in this specific sense: the collective material content and spatiotemporal region of the or-elements of tree-ish plurality p1 are virtually the same as the collective material content and spatiotemporal region for the or-elements of tree-ish plurality p2. In order to express the idea that for a single tree the relevant tree-ish pluralities are intimately related to one another, let’s say that when there is a single tree in the backyard, there are many tree-ish pluralities in the backyard and they are *tree-unified*. They “belong to” the very same tree. That is, *the plurality of the tree-ish pluralities* is tree-unified.

Four points on ‘is/are arranged tree-ish’:

First, the predicate ‘is/are arranged tree-ish’ is not the same as ‘is arranged tree-wise’, at least as van Inwagen uses it (1990, 105 & 109). For van Inwagen, a tree-wise plurality’s elements are mutually simultaneous, whereas mine are temporally extended through the tree’s existence.

Second, unlike most philosophers who employ terms similar to ‘is/are arranged tree-ish’, I am not eliminating trees from our ontology. I will design the theory so that it’s metaphysically possible that a world “just like ours” microphysically has no trees, but one could jettison that clause.

Third, as for what it takes for a temporally extended plurality of dots to satisfy ‘is/are arranged tree-ish’, I would advise against an armchair approach and advocate a fully scientific one. So I recommend we don’t start with an analysis that runs anything similar to, ‘The sentence ‘Plurality P is arranged tree-ish’ is true iff the sentence ‘Given the existence of trees, P composes a tree’/’If trees existed, P would compose a tree’/etc. is true’. Instead, have a bunch of tree experts examine about a million things they take to be trees and see what they come up with for their tree-ish pluralities. They will start that project by analyzing a given tree at a particular moment. They will consider the dots that according to them make up the tree. (This takes genuine expertise, since, for instance, an amateur might say that bit x is part of the tree whereas the expert would say that x is just some matter that is “passing through”.) Then we can take the mutually simultaneous temporally minimal temporal parts of those dots. We have thus come up with one temporal slice of the plurality that is arranged tree-ish. Keep doing this, both for that particular case and about a million others. Then see what they have botanically in common, more or less. Let experts on trees figure that out. We would certainly rely on them to figure out an illuminating story for ‘is a tree’, so they should be the ones to do the bulk of the work on an illuminating story for ‘is/are arranged tree-ish’.

Fourth, as for the question, ‘Do tree-ish pluralities P1 and P2 belong to the same tree?’, there are going to be vagueness cases. Imagine “two” trees that overlap considerably, especially in their root systems and trunks. Is there *one* rather odd tree there or are there *two* rather odd trees there? I assume that cases can be envisioned in which even tree experts couldn’t answer confidently no matter how much research they did. Similarly, ‘Do tree-ish pluralities P1 and P2 belong to the same tree?’ can’t be answered confidently either, for certain odd cases. For the vast majority of cases, however, the question is answered without the slightest difficulty.

According to Plurality Pointillism, ‘There is a tree’ comes out true this way: *there is at least one tree-unified plurality of tree-ish pluralities that are either BLPs or pure/simple BPs.* Given our previous illustrative assumptions about quarks and protons, ‘is a quark’ is true of a simple, ‘is a proton’ is true of a pure/simple BP (of three quark-simples), and ‘is/are arranged tree-ish’ is true of either a pure/simple BP or BLP, and ‘is/are tree-unified’ is true of an impure BP or an impure or pure BLP (each 1-element of a tree-unified plurality is a plurality; so if the tree-unified plurality is a BP, then it’s an impure BP). *The predicate ‘is a tree’ applies to reality but only in an indirect fashion*. ‘There are trees’ is true because ‘are tree-unified’ and ‘are tree-ish’ are true of certain pluralities. There is more on this new form of predication below.

Generalizing on this idea, we have two theses:

T1: There are three possible ways ‘There is an F’ can come out true: it can derive its truth from (i) a single simple that’s F, (ii) a BLP or pure/simple BP that’s F, or (iii) many F-ish BLPs or pure/simple BPs that are collectively F-unified.

T2: There are three possible ways ‘N exists’, for proper name N, can come out true: it can derive its truth from (i) a single simple that is N, (ii) a BLP or pure/simple BP that is N, or (iii) many N-ish BLPs or pure/simple BPs that are collectively N-unified.

For **T2**, we need clause (iii) for names of ordinary things such as people, cats, mountains, etc.

Five explanatory points:

- I don’t know how limited the quantifier for ‘F’ is (similarly for ‘N’). **T1** is plausible for a great many Fs; the primary question is whether it’s true for *all the ones we care about*. For instance, we shouldn’t substitute ‘non-existent’ or other troublesome predicates (or pseudo-predicates) in for ‘F’.
- If Referential Sobriety is necessarily false, then the third way for each thesis can be deleted. If simples are impossible, then the first way can be deleted.
- All the 1-elements of an F-unified/N-unified plurality are pluralities. Hence, the F-unified/N-unified plurality is either an impure BP or a BLP (pure or impure), depending on the metaphysical

details of the possible world in question. In addition, as we saw earlier if it's an impure BP, it could also be a pure BP due to the oddities of plurality identity.

- **T1** and **T2** are saying that *the things in the world that make our sentences true either boil down to simples (clauses (i) and (ii)) or are BLPs (clauses (ii) and (iii))*. Nothing else is needed.
- We have yet to say anything about parthood or composition. It's also worth noticing that we have had no *need* to talk about them yet.

The thinking behind the third thesis **T3** starts from the observation that although 'is a part of' may or may not latch on to a joint in nature, or metaphysically important universal or species or genera or something similar, it can be precisified in multiple ways—and the precisifications may be philosophically, scientifically, or otherwise useful. Let me elaborate.

We have terms like 'helps make up', 'helps compose', 'is a part of', etc. The initial question is: do these terms "get at" some single property or kind—like how 'electron' does? What I'm saying is that *whether or not the answer is positive*, there's room for multiple interesting precisifications. I think this should be relatively uncontroversial, as one can make the same move for other philosophically key phrases, such as 'free will', 'knowledge', 'miracle', etc. One can, for a specific purpose, just offer a *stipulation* of how one is going to use a philosophically important term in a certain theoretical context, and then go on to *justify the stipulation on utilitarian grounds* by arguing that subsequent use of the stipulation will have such-and-such benefits.

For instance, in ordinary life when we say or imply that x is "a part of" y we virtually always are disposed to think that both x and y are more or less "unified" objects. Object x, the part, won't be some utterly random plurality of things that are widely scattered throughout the universe. If x were like that, then it would hardly be *a* part, as the 'a' in 'a part' indicates, in ordinary use, a single *unified* thing. By 'indicates in ordinary use' I mean, roughly, that virtually all competent users of 'part' are disposed to think that parts are almost never paradigmatically non-unified things. Similarly, we use 'x is a part of y' in such a way that object y has got to be similarly unified. So *if* we want a precisification of 'is a part of' that captures a good portion of everyday thought regarding 'is part of', *then* when designing our precisification we should probably use the fortunately (!) wildly imprecise term 'unified'.

We will be left with a serious amount of leeway when coming up with a commonsensical precisification of 'x is part of y'. However, any decent precisification we come up with will be built up from the notions we encountered in **T1** and **T2**. As a result, Plurality Pointillism offers a substantive thesis regarding the nature of parthood:

<u>T3:</u> Any reasonable precisification (including the true one, if such exists) for 'x is part of y' boils down to nothing more than these substantive notions: the plurality notion, the 'x is one of plurality y' notion, the 'arranged F-ish/N-ish' notions, and the 'F-unified/N-unified' notions. Those are the notions that parthood reduces to.

This is not to say that **T3** is maximally perspicuous. For instance, perhaps N-unified can be reduced to the other notions. That's fine: I'm trying to fill out Pointillism with plausibly true and interesting theses, even if the result could be significantly improved.

With **T3** in hand we have, in some soft sense, "explained" or "reduced" or "analyzed" parthood (and hence composition, although I won't treat that reduction here) in terms of the key notions listed in **T3**. What is odd, and a virtue I think, is the fact we did so without taking any position on the *extent* of composition, in any world: always (unrestricted), never (Compositional Nihilism), or sometimes (moderate views). Plurality Pointillism is not a theory of parthood in the sense of offering necessary and sufficient conditions for x being a part of y; that's why I said we have analyzed parthood "in a soft sense". But it does tell us what parthood and hence composition boil down to. There are two issues here: what does parthood come from, and what is its extent. My theory treats the former question only.

If the general idea of Pointillism is true, then trees are like protons in being no "real addition" to the universe once you've accepted the little bits that make them up—even if there are no simples. But according to Plurality Pointillism, if tree T exists, it's not identical to any simple or plurality; so, it sure looks like something *in addition to* simples and pluralities. What is going on?

I think we have the materials to satisfactorily respond to that challenge.

> **<u>T4:</u>** The predicate 'is a tree' has a second-class relation to reality compared to that for 'is a proton'. The term 'is a proton' applies to reality *directly*: it is true of a pure/simple BP (again, with our pop-science assumption). But 'is a tree' applies to reality only *indirectly*: although it is not true of any plurality (or simple), 'is tree-unified' directly applies to a plurality of a tree-ish pure/simple BPs or BLPs—and this is why 'there are trees' comes out true. There are pluralities that literally are protons but none that are trees. *'There are trees' comes out true, but not in virtue of 'is a tree' applying to some thing or some things.*

Trees are not second-class *existents*. The second-classness is representational, not ontological. Thesis **T4** means that trees are no "real addition" to reality once we have listed all the simples (if any), tree-ish pluralities, and tree-unified pluralities. **T4** is an elaboration of **T1**.

Many philosophers think that there is just one way for 'is an F' to apply to reality: there is a thing x such that x itself is F. Although that is the familiar way to predicate satisfaction, my theory says there is another way: there are some things that are F-unified. Although the second way may seem unfamiliar, it is the way predication works in *the vast majority* of cases (e.g. 'tree', 'rabbit', 'person', 'baseball', 'candle', etc.). I don't think this necessarily means we have to revise logic, but it does mean we need to rethink the predicate-reality relation.

When trying to get a grip on this idea about predication, I find it helpful to actually look at a tree and imagine it as a 3d pointillist object akin to a 2d pointillist painting. A tree is, in the relevant respect, like a swarm of bees spread out in time. The predicate 'is a tree' applies to that swarm-area perfectly well—

trees exist—but there is no particular bee or particular swarm that satisfies 'is a tree'. If that offends our conception of predicate-reality relations, well, so be it. If you have done much philosophy at all, especially regarding paradoxes, then you have already gotten used to being philosophically offended.

As we have seen, the oddity of trees compared to protons is this: a tree is nothing over and above electrons and quarks, but you can't whittle down the group of electrons and quarks to the ones that "fit" the tree exactly—because there is no such group, assuming Referential Sobriety. This means there is a crucial ambiguity in the notion 'x is nothing over and above (NOAA) the ys': whereas a proton is NOAA tiny bits because it's identical to a plurality of such bits, a tree is NOAA tiny bits because certain appropriately characterized pluralities of those bits are unified appropriately.

This also means that the Special Composition Question, 'When is it true that there is a y such that the xs compose y?' (van Inwagen 1990, 30) has a false presupposition: the claim that for any composite object, there is a plurality of entities that composes it. On the contrary, a tree is composite but there is no plurality that composes it.

This distinction in how terms apply to reality—'is a proton' vs. 'is a tree'—helps illuminate the thesis of Referential Sobriety. It's natural to initially think the thesis has to do with vagueness, but this is misleading. The predicate 'is arranged tree-ish' is vague due to borderline cases but still applies to reality the same way 'is a proton' does: it latches onto a particular plurality. The predicate 'is a tree' does not apply to reality in that fashion. Referential Sobriety says that whereas 'is tree-ish' is true of pluralities, 'is a tree' is not true of pluralities—even though both predicates have borderline cases, exhibit tolerance, and generate sorites paradoxes. Hence, vagueness is not the primary reason for Referential Sobriety. Just because 'is an F' is vague doesn't mean it applies to reality in the second-class manner.

The reason 'is a tree' applies to reality only indirectly is twofold: it is vague and, roughly put, there is *just one* tree in the backyard. There isn't anything *terribly* counterintuitive with the idea that in my backyard there are trillions of tree-ish arrangements. Perhaps it is counterintuitive, but then it is only mildly so given that no one outside a metaphysics discussion has ever heard of such arrangements. But the idea that in my backyard there are trillions of trees is just plain false.

Of course, there are other options for fitting trees into a pointillist universe. So see them, consider the following individually plausible yet jointly inconsistent claims.

1. 'is a tree' applies to a universe in which everything boils down to dots.
2. 'is a tree' applies to a universe in which everything boils down to dots $\supset$ 'is a tree' applies to a dot or a pure/simple BP or BLP in that universe.
3. 'is a tree' applies to a dot $\supset$ some tree is a dot.
4. No tree is a dot.
5. 'is a tree' applies to a pure/simple BP or BLP $\supset$ 'is a tree' applies to zillions of pure/simple BPs or BLPs.

6. It's not the case that 'is a tree' applies to zillions of pure/simple BPs or BLPs.

Due to the inconsistency, one has to reject at least one of (1)-(6). One could reject (1), asserting that there are no trees in universes in which everything boils down to dots. One could say this either because one thinks dot-universes are metaphysically impossible or because although they are metaphysically possible, none have trees. One could reject (5) by attributing magical powers of discrimination to ordinary language, thereby rejecting Referential Sobriety. One could reject (6) by asserting that there are a *lot* more trees out there than common sense says. Those are three not entirely implausible ways of responding to the paradox captured by (1)-(6). (3) and (4) are obviously true. Only (2) is left. By my lights, rejecting (2), as the plurality pointillist does, is more reasonable than rejecting any of (1), (5), or (6). The offensive taste of rejecting (2) is softened by the theory about second-class predication.

6. Plurality Pointillism and Being Out There in Reality

Isn't it the case that according to Plurality Pointillism the only things *really out there in reality* are simples, pure/simple BPs, and BLPs, at most? Shouldn't the plurality pointillist conclude that trees aren't, well, really out there?

For what it's worth, I find myself going back and forth between two conceptions of what it is to be "an entity out there in reality":

> ***Conservative Conception***: Trees are really out there in the world as entities if and only if 'is a tree' applies to reality on the proton model (viz. being true of a simple or plurality). But 'is a tree' fails to fit reality like that, since it fits reality only via 'is tree-unified' and 'is tree-ish'. So, trees aren't entities out there in our environment despite the truth of 'There are trees' and the fact that there are many tree-unified and tree-ish entities out there in reality.
>
> ***Liberal Conception***: What we have learned is that there are two ways to be "an entity out there in reality". There is the theoretically familiar and simple way, the way 'is a proton' works; and then there is the other way, the one that applies to 'is a tree' and the vast majority of other predicates from natural language. Furthermore, *the latter is derivative of the former*: 'is a tree' applies to reality because it's semantically related to both 'is tree-unified' and 'is arranged tree-ish', both of which apply to reality in the first, familiar way.

Perhaps there are good reasons to choose one of these over the other, but I'm not sure much hangs on it. When it comes to the question, 'Are trees out there in reality or not?' I'm inclined to "go linguistic" and refuse to give a yes/no answer.

7. Plurality Pointillism and Non-Being

Consider again the pure BLP world: nothing but pluralities of pluralities of pluralities, etc. It isn't difficult to get the impression that such a world is one of appearance only, of *mere smoke* as it were. One could even say it's a world of pure appearance—but minus the subjectivity. After all, everything you encounter, when examined closely, dissolves into stuff that dissolves into stuff that dissolves into stuff, ad infinitum. One might think that there is nothing really *there*. Sure, ordinary beliefs and sentences come out true given Plurality Pointillism, but only by watering down what it takes for the world to make them true. Although the world itself isn't a homogeneous goo, it is a heterogeneous goo that doesn't have honest to goodness *entities* in it, even though the features of the goo allow for the truth of entity-like claims. Rocks are certainly entities, and 'There are rocks', 'Rocks exist', and 'Rocks really exist out there in reality' all come out true, but only on a technicality so to speak! Rocks may be entities but they aren't *superlative* entities—where a "superlative entity" is one straightforwardly picked out through the normal kind of predication.

Plurality Pointillism doesn't entail that such worlds are possible; it doesn't even entail that BLPs are possible. It merely makes room for them.

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