Comments on Hsuan-Chih Lin and Hwan Ho's

"Mereological Nominalism: From a Locationist Point of View"

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Mereological Nominalism, traditionally understood, is a reductionist account of properties that endorses the following two theses:

PROPERTIES ARE FUSIONS OF INSTANCES (PF) Every property is a fusion of its instances.

INSTANTIATION IS MEREOLOGICAL (IM) x instantiates F iff x is a part of F.

But as Lin and Ho point out, mereological nominalism is open to serious objections. They focus on three. First, the *coextension problem*: it wrongly identifies distinct but coextensive properties. Second, the *inheritance problem*: it wrongly requires that a part of an instance of a property also be an instance of the property. Third, the *relation problem*: if relations are fusions of their relata, it wrongly identifies relations that have the same relata differently related. All of these are problems of *individuation.* The coextension and relation problems show directly that the account gets the individuation conditions for properties and relations wrong. The inheritance problem also shows that the account leads to incorrect individuation conditions, wrongly identifying a property had by some objects with a property had by those objects and their parts. To solve these problems, Lin and Ho propose amending traditional mereological nominalism by introducing abstract locations in a "quality space", and reconstruing instances as "objects-at-locations". I find Lin and Ho's account interesting and worthy of serious consideration. Indeed, I myself have nominalist sympathies, and invoke mereology in my reductive endeavors. But given my own metaphysical commitments, Lin and Ho's version of mereological nominalism is not an account that I can accept. In what follows, I raise three worries for their account. Nonetheless I think their account is suggestive of an alternative

account that I find attractive and that better comports with the goals of mereological nominalism, at least as I see it. I sketch this alternative at the end of these comments.

Before turning to Lin and Ho's account, I want to make two preliminary observations. First, nominalism comes in (at least) two varieties that need to be carefully kept apart. Traditional (or medieval) nominalism is the rejection of universals: all that exists is particular. Harvard nominalism (on one use of that term) is the rejection of abstract objects: all that exists is concrete. I agree with Lin and Ho that the 'nominalism' in 'mereological nominalism' is traditional, not Harvard, nominalism; and that therefore it is no objection to a version of mereological nominalism that it countenances abstract entities, including "locations" in a quality space.

Second, there are two conceptions of properties: sparse and abundant. On the sparse conception, there are only as many properties as are needed to ground the objective resemblances between things, and the causal properties of things. Properties on the sparse conception "carve at the joints". On the abundant conception, for every set of things there is a property had by all and only the members of that set. When (PF) quantifies over "all properties", are these properties on a sparse or abundant conception? Although Lin and Ho do not say, I will suppose that mereological nominalism intends to provide a reduction for properties on a sparse conception. Otherwise the coextension problem would be even worse: all negations of properties not instantiated by the universe – the fusion of everything – would be identified with the universe. In any case, the locationist views they cited all take the locations in quality space to be, or correspond to, sparse properties. Moreover, given that nominalists can help themselves to abstract objects such as sets, there would be nothing to favor a reduction of *abundant* properties to fusions of their instances over a reduction to sets of their instances. But I take it that sparse properties are imminent – constituents of the world – in a way that sets are not. So as a reduction of *sparse* properties, taking properties to be fusions of instances can succeed where sets of instances fail.

I turn now to Lin and Ho's account. Their goal is to provide a version of mereological nominalism that is not subject to the three objections mentioned above. Their idea is to make use of a quality space, the locations of which they take to comprise a fundamental ontological

category. Whereas it is natural to identify the locations in quality space with the properties themselves, and the occupation relation with instantiation, for Lin and Ho the locations are not themselves properties, but are to be correlated with properties by the reduction. To this end, they introduce new entities, objects-at-locations, which they take to be instances of properties. These posited entities, they claim, are both fundamental and complex. The properties are then constructed mereologically from their instances, the objects-at-locations. That requires reconfiguring the two theses of mereological nominalism as follows:[1]

(PF)$_{Lin/Ho}$ Every property F is a fusion of x_1 at s, …, x_n at s, for some unique abstract location s.

Let s_F be the abstract location correlated by (PF)$_{Lin}$ with the property F. Then,

(IM)$_{Lin/Ho}$ x instantiates F iff x at s_F is part of F.

A crucial question will be: how should we think of these entities which Lin and Ho call "objects-at-locations"? Indeed, one might wonder whether an object x at a location is a new, exotic entity, or just the object x. In English, when I say, for example, "Socrates at noon is sitting", this is arguably equivalent to "Socrates is sitting at noon", and so is just about Socrates, not some exotic entity, Socrates-at-noon. But it quickly becomes apparent that Lin and Ho need x-at-s to be distinct from x if their account is to resolve the objections. Below I will return to consider what these entities might be. A second crucial question will be how mereology applies to these new entities. According to Lin and Ho, x at s is part of x' at s' iff x is part of x' and s is part of s'. (Note that abstract locations may be *regions*, not just *points*, of quality space, and that one region is part of another just in case every point belonging to the former belongs to the latter.) A third crucial question has to do with the individuation conditions for objects-at-locations. To solve the coextension problem, they will have to be individuated as finely as the locations. Thus, x at s = x' at s' only if s = s'.

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[1] I have slightly altered Lin and Ho's formulations, which appear to use the same subscript 'n' in two different ways, and raise unnecessary circularity worries.

The first worry I have for Lin and Ho's account is this. In the reconfigured mereological nominalism, they have changed what it is to be an instance of a property. It seems that they now take *objects-at-locations* to be instances of properties rather than *objects*; for Lin and Ho accept both that properties are fusions of their instances and that properties are fusions of objects-at-locations. But that can't be right. For example, an instance of the property *being red* is whatever is red. Thus, a red ball is an instance of *being red*. But a red ball is an object, not an object-at-a-location. So, even if the red-ball-at-s_{red} is also an instance of *being red* – something that cannot be determined without knowing more about what objects-at-locations are – the fusion that makes up the property *being red* should have the red ball among its parts. But on Lin and Ho's account, it doesn't. This problem is on full display in Lin and Ho's statement of the thesis that instantiation is mereological, what I called (IM)$_{Lin/Ho}$. For it says that the *object x* instantiates the property, not the *object-at-a-location*, x-at-s_F. But in other places, Lin and Ho speak as if the instances of a property are objects-at-locations, not objects. I will return to this problem at the end. On the version of mereological nominalism that I propose, it has an easy solution.

A second, more serious worry is this. When one sees how Lin and Ho's account resolves the coextension problem and gets the individuation of properties right, one sees that all the work is being done by the locations in quality space, and how they are individuated. Thus, consider distinct coextensive properties F and G that traditional mereological nominalism fails to distinguish. How does Lin and Ho's account do better? There will be two distinct locations in quality space, s_F and s_G. Since the instances of F, on their account, are all objects-at-s_F and the instances of G are all objects-at-s_G, the fusions of their instances will be distinct. But this distinctness is due to the individuation of locations in quality space; the mereology has nothing to do with it. It seems then that the fusions that they take to *be* the properties are superfluous, and that the locations in quality space are the properties in all but name. The worry here is not that the locations in quality space are objectionable in virtue of being abstract, and so should not play a role in a nominalist account. The worry is that once one has accepted the locations as part of one's fundamental ontology, there is nothing to be gained by introducing new entities called "objects-at-locations" and then defining "properties" to be fusions of these new entities.

It's not as if taking properties to be fusions better captures any ordinary or philosophical usage of the term 'property'.

Perhaps considering an analogous case will help to sharpen and extend this worry. Suppose I am seeking a mereological nominalist reduction, not of properties, but of natural numbers. First, I posit a fundamental space, or structure, whose points, or positions, stand in a successor relation that satisfies the Peano postulates. The positions in the structure can be labeled by numbers, 0, 1, 2, …; but the positions, I claim, are not the numbers. Second, I note that objects can be located at positions in the structure in accordance with the number of ultimate parts they contain. Thus, an object composed of three ultimate parts is located at the position labeled "three". Then, for each object and position at which it is located, I introduce a new entity, an object-at-a-position. Finally, the natural numbers are identified with certain fusions of objects-at-positions. For example, the number three is the fusion of the objects at the position labeled "three". This account of numbers accepts the fundamental ontology and ideology of a structuralist account of numbers, but then refuses to accept the structuralist's identification of numbers with positions in the structure. Instead, it introduces new exotic entities and defines numbers in terms of them, thus complicating the account and making it ontologically less parsimonious. To what end? If I am right that this account of numbers is analogous to Lin and Ho's account of properties, it suggests that their account too is overly complicated and unparsimonious for no discernible reason. It also suggests just how easy it is to provide a mereological nominalist reduction of any kind of disputed entity by first endorsing a structuralist account of those entities. Too easy, I think.

The final worry that I will raise has already been mentioned: just what are these entities that Lin and Ho call "objects-at-locations"? They say only this: "It would be wise to regard '*x* at *s*' as fundamental and yet complex entities." They rightly say that positing fundamental, yet complex entities need not violate nominalism: such entities are particulars not universals, and I don't see why they would need to have any universals, such as a universal relation of occupation, as constituents. But I for one find them objectionable on grounds of mysteriousness. Indeed, I hold that the only sort of complexity there is in the world is *mereological* complexity, and these entities cannot be taken to be fusions of objects and

locations without reintroducing the problems of individuation. Is there a way of understanding these entities as both fundamental and *simple*?

The version of mereological nominalism that I find attractive replaces Lin and Ho's objects-at-locations with *tropes*. Tropes, being particulars, are fully compatible with traditional nominalism. To illustrate: suppose for the sake of an example that (determinate) shades of red are sparse properties within the scope of the account. When two balls share a property by being the same shade of red, each ball has as part its own particular shade of red, its own redness trope, with each of these redness tropes exactly resembling the other. Tropes are not themselves properties, but in line with mereological nominalism, (determinate) properties can be identified with maximal fusions of exactly resembling tropes. I suppose that tropes are themselves instances of the properties that they are part of: for example, a redness trope is red. But trope-instances must be distinguished from object-instances. Thus, the thesis of traditional mereological nominalism, that properties are fusions of their object-instances, is replaced with:

(PF)$_{trope}$ Every property is a fusion of its trope-instances.

On the trope theory I endorse, objects are themselves maximal fusions of (spatiotemporally) co-located tropes. Then, we can replace the second thesis of mereological nominalism, that instantiation is *parthood*, with the claim that instantiation is *overlap*:

(IM)$_{trope}$ An object instantiates a property iff the object overlaps that property.

Instantiation is parthood only for trope-instances, not for object-instances. This deviation from traditional mereological nominalism solves the first worry I had for Lin and Ho's account, but clearly without sacrificing its mereological *bona fides*. It solves the second worry I raised because it no longer takes locations in a quality space to be fundamental, positing what appear to be the properties in disguise. And it solves the third worry because tropes can do the work of

Lin and Ho's objects-at-locations without introducing mysterious entities with unmereological complexity.

Moreover, the trope version of mereological nominalism solves the problems of individuation no less than Lin and Ho's version. The conception of tropes I have in mind is maximally sparse, and so also is the resulting conception of properties: only fundamental properties will be fusions of tropes. I suspect Lin and Ho have a less sparse conception of properties in mind, in which case not all of their objects-at-locations will correspond to tropes. But to compare like with like, we can restrict the objects in question to point-sized objects and the locations to points of the quality space, rather than regions. So construed, Lin and Ho's objects-at-locations, though complex, are mereologically simple, and have no other objects-at-locations as proper parts. There will then be a one-one correspondence between the tropes and the objects-at-locations. One direction: for any trope, there is a unique object-at-a-location, x at s_F, where x is the unique object and F the unique property that the trope belongs to. Other direction: for any object-at-a-location, there is a unique trope that is the intersection of that object and the property correlated with that location. Because the tropes and objects-at-locations correspond one-one, and are mereologically simple, the trope account and Lin and Ho's account will solve the problems of individuation faced by traditional mereological nominalism in corresponding ways. Suppose there are distinct but coextensive fundamental properties. Where Lin and Ho will say that the properties are distinct by having different objects-at-locations as parts, the trope theorist will say they are distinct by having different tropes as parts.

Of course, much more needs to be said about the trope theory sketched above. In particular, how should it deal with determinable properties and with relations? But perhaps I have said enough to suggest that a trope-theoretic version of mereological nominalism is a worthy contender.