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Michael C. LaBossiere [a]
[a] Florida A. and M. University,

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SUBSTANCES AND SUBSTRATA

Michael C. LaBossiere

I. Introduction, Tropes and Substances

A reasonably plausible solution to the problem of universals is a trope theory. However, even if a trope theory is accepted, there are still issues that must be settled. In this paper, the focus will be on the issue of deciding between a trope-substrata view and a bundle of tropes view. In the course of this work tropes, substances, and substrata will receive careful attention and arguments will be presented against the bundle of tropes view in favour of the trope-substrata view.

Tropes

Consider a sack of six marbles. Imagine that these marbles are all of the same exact shade of blue and are of the same spherical shape, although each marble differs from the others in size. Assume, probably incorrectly, that colour is a property of objects. In this case colour appears both as a type, namely the shade of blue all the marbles have, and a token, namely the particular instance of the shade of blue that is had uniquely by each marble. There are also six tokens of the spherical shape type present, assuming that shape is a property of objects, but only one instance of each particular size, since each marble has a different size than any other.[1]

In order to understand what tropes are, it is best to consider an immanent universal theorist's analysis of the previous example and contrast it with a trope-theorist's analysis of the situation. An immanent universal is a property that can be wholly located at many different locations on the same dimension at the same time.[2] An immanent universal theorist would offer the following analysis of the above situation: there are six particulars present in the sack, namely the six marbles. There are eight different universals present and a total of eighteen instances of those universals: six instances of the universal blue, six instances of the universal of having a spherical shape and one instance of each

[1] This example is based on one of Keith Campbell's. For Campbell's initial characterization of tropes, see *Abstract Particulars* (Oxford: Blackwell, 1990) pp.2-4.

[2] While particulars and universals and the distinction between the two are known to most philosophers, it is important for precise definitions to be provided so as to avoid confusion. A particular is, very simply, an entity that is not a universal. The most common statement of the distinction between universals and particulars is given in terms of space and time. A precise definition, that serves to capture what a particular intuitively is, is as follows: a particular is an entity that can be wholly present at only one spatial location at a time, while a universal is an entity that can be wholly present at many distinct spatial locations at the same time (or instantiated in many places at the same time, in the case of transcendent universals). Obviously, this distinction will only hold for spatial entities. Since non-spatial entities should not be rejected out of hand, particularity and universality need to be defined in such a way so as not to beg the question against those who postulate non-spatial entities. In light of this requirement, particularity can be described as follows: a particular is an entity that can, at most, be wholly present, at a single time, at one place on each dimension at a time. A particular need not occupy a place on every

different size present.

According to the trope theorist, tropes are, like universals, properties. Unlike universals, tropes are limited to occupying at most one location on each dimension at a time. Thus, the trope theorist would offer the following analysis of the situation: there are twenty four particulars in the sack. Six of the particulars are objects, namely the marbles. Eighteen of the particulars are tropes: six exactly resembling, but non-identical blue tropes; six exactly resembling, but non-identical shape tropes; and six different, but resembling shape tropes.

Thus, where an immanent universal theorist postulates a universal, the trope theorist postulates a trope. Where the immanent universal theorist uses the mechanism of identity to group tokens into types, the trope theorist uses the mechanism of resemblance. Both views are realist views about properties, but they are in dispute over whether properties are particulars or universals. Thus, put simply, tropes are properties which can be located at most on a single place on each dimension at the same time.

Substances

According to Descartes, a substance is 'a thing which exists in such a way as to depend on no other thing for its existence'.[3] Those familiar with the history of philosophy will be well aware that the term 'substance' has been used in many different ways. Some of the alternative uses are as follows. First, the term can be taken to mean the 'real essence' of the thing in question. Second, the term can be taken to refer to that which supports properties. Third, the term can be taken in the sense in which substances are a 'things most fundamental or categorical properties'.[4] There are also other uses of 'substance' that have not been included here. Whatever the merits of these other uses of 'substance', the term will not be used in this work in any of those ways. This is not because of any inherent superiority in the Cartesian definition over the alternatives, but because a short and handy term is needed to refer to entities which do not depend on other entities for their existence. 'Substance' is as convenient a term as any and enjoys a fair degree of acceptance in its use in this manner. Fortunately, it is not essential which term gets defined which way, as long as each term has a distinct definition that will aid in clarity and the avoidance of confusion and misunderstanding.

As has been noted, a substance is an entity whose existence depends on no other entities.[5] This definition captures the notion of substance which is in use here, but certain

[2] *continued...*
(non-temporal) dimension, but a particular can only occupy one such place on each dimension at a time. A universal would be an entity that can be wholly present, at a single time, at more than one place on each dimension at a time (or can be instantiated in many places on the same dimension at the same time). Campbell asserts that '*place on a dimension* can be regarded as a rather formal concept involving order and structure, with space providing only our most comfortably familiar example' (*Abstract Particulars,* p.55). These definitions of particularity and universality have the advantage of avoiding any commitment to the existence or non-existence of non-spatial entities and their neutrality makes them a good, non-question-begging starting point.

[3] R. Descartes, *The Philosophic Writings of Descartes,* trans. J. Cottingham, R. Stoothoff, and D. Murdoch (Cambridge: Cambridge University Press, 1985) p.210.

[4] C.B. Martin, 'Substance Substantiated', *Australasian Journal of Philosophy* 58 (1980) pp.3-10, esp. p.4.

[5] Dependence can be expressed in modal terms. If x is dependent on y, then it is not possible for x to exist when y does not (y's existence is necessary for x's existence). This may be expressed

complexities must be considered in discussing the nature of substances. As has been noted, substances are entities capable of independent[6] existence, but what independent existence amounts to depends on the dependence hierarchy of the world. The dependence hierarchy is simply the various relations of metaphysical dependence that hold between the various entities. In this context, a general definition of 'substance' would be:

x is an n-ary substance iff x's existence is independent of all other n-level entities.

An entity that depended on no other entities at all would be a prime substance. For example, suppose that spatial-temporal entities can exist independently of one another but are dependent on space-time, such that there could be one such entity in space-time and no others. Suppose further that space-times cannot exist without God, but they can exist independently of one another. Suppose that God requires nothing else to exist. In such a situation, God would be the prime substance (since His existence does not depend on the existence of any other entities), space-time a secondary substance, and spatial temporal entities would be tertiary substances. Suppose that properties and substrata cannot exist independently of one another. Since they are at the same ontological level, they would not be substances.

II. Bundles vs. Substrata

The Need For Substances

In the context of trope theory, one of the main issues is the relation between tropes and substances. A bundle theorist who accepted substances would be inclined to accept that any bundle of tropes that could exist independently of all other trope bundles would constitute a substance. Of course, if tropes could exist independently of one another, then such tropes would be substances. A trope-substratum theorist who accepted substances would accept any group of tropes bound by a substratum capable of existing apart of other such groupings as a substance. Because both the bundle theorist and the trope-substrata theorist can accept substances with tropes as constituents, the important debate between the two is whether or not such substances are composed solely of tropes. As has been noted, the trope-substratum theorist will claim that substances include at least two types of entities, namely tropes and substrata.

It seems reasonable to accept that substances are at least groups of tropes,[7] because

[5] *continued. . .*
logically as follows: the claim that it is not possible for x to exist without y is true at w (a particular world) iff there is no world u in W (the non-empty set of possible worlds) such that x exists and y does not in u. Talk of these worlds is talk of a model. I should not be construed as being committed to possible worlds realism.

[6] Independent existence can be defined as the denial of dependence and may be expressed in modal terms: if x is independent of y, then it is possible for x to exist when y does not. In such cases, y is not necessary for x. The nature of this possibility can be logical. For example, Hume's definition of 'substance' is that which is logically capable of independent existence. The claim that it is possible for x to exist without y is true at w iff there is some W such that x exists and y does not.

[7] This general argument is drawn from Armstrong's argument in *Universals: An Opinionated Introduction* (Boulder, CO: Westview Press, 1989) p.115.

the claim that each trope is a substance is an implausible claim. It is particularly clear that relational tropes, if there are any, should not be accepted as substances. It is rather difficult to accept that a relation could exist without any related entities. If tropes are substances, then any single trope could exist independently of all other tropes. So, for example, if there are individual mass and charge tropes, then there could be a world which contains a single mass trope, M. It would also have to be possible for a shape trope to exist on its own, a size trope to exist on its own, and a pitch trope to exist on its own. Since these claims are implausible, it would seem that single tropes will not do as substances. Hence, a substance will have to consist of at least multiple tropes. Of course, it remains to be seen whether a substance is best taken to be a bundle of tropes or tropes and a substratum.

The Regress Argument for Substrata

One initial advantage of a bundle of tropes view over a trope-substrata view is the ontological economy of bundle theory. While the trope-substrata theorist accepts at least two distinct ontological kinds, the bundle theorist need accept only one. Given this economy, it would seem reasonable, at least initially, to accept a bundle view over a trope-substrata view. However, it is contended that this initial advantage of economy turns out to be a false one.

Consider an object, $\sum$, that has trope A and B and another object, Δ, that has tropes C and D. It seems clear that the mere existence of tropes A, B, C, and D is not enough to account for the fact that $\sum$ is A and B (for example, that $\sum$ is cubical and solid) and that Δ is C and D. Without something which groups A and B together and something that groups C and D together, there would be no distinct $\sum$ and Δ. There would be just the tropes A, B, C, and D and no higher order entities, like objects. Objects like $\sum$ and Δ are more than just 'loose' tropes, they are tropes that are organized and grouped together to form complex entities like tables, electrons, and galaxies. Hence, it would seem that something more is needed over and above tropes.

A sophisticated bundle theorist can easily answer this initial objection. After all, her tropes are not 'loose', but instead exist within bundles that form higher order entities. However, in order to remain a bundle of tropes theorist, the bundle theorist must argue that the 'something more' which serves to bind tropes together is not an additional ontological kind. The bundle theorist has two main options to avoid accepting an additional ontological kind.

The first option is for the bundle theorist to deny that the binder of tropes has any real being, although tropes are bound into bundles and organized into highly complex entities. This option is not very plausible as it involves denying the reality of something that clearly takes an active role in reality and doing this run contrary to Plato's 'mark of being':

> I suggest that anything has real being that is so constituted as to possess any sort of power either to affect anything else or to be affected, in however small a degree, by the most insignificant agent, though it be only once. I am proposing a mark to distinguish real things that they are nothing but power.[8]

[8] Plato, *Sophist* in *Collected Dialogues* (eds) E. Hamilton and H. Cairns (Princeton: Princeton University Press, 1985) p.992 (247 d-e).

This mark of being is reasonable to accept. It certainly seems unreasonable (and highly uneconomical) to postulate entities that are utterly incapable of doing anything or having anything done to them. It seems reasonable to accept that anything which can affect or be affected must be real. Since the binding of tropes together and the ordering of them to form complex entities clearly seem to be instances of affective activity, it seems reasonable to accept a real binder. To assume, at this point, that this binder must be a substratum because a substratum is by definition a binder or properties, would beg the question. This is because a substratum is not simply a binder of properties, but a non-property binder of properties. In this context, a substratum has to be a non-trope binder of tropes.

A bundle theorist can agree that there are real beings involved in the binding of tropes while rejecting the claim that the real binders are substrata. This is the second option. In order to do this, the bundle theorist would argue that there are binding tropes which serve to bind tropes together.[9] Because binding tropes are obviously tropes, the bundle theorist is able to retain the initial advantage of economy over the trope-substrata theorist while still accepting the required real binder. However, this position faces a serious problem.

On the binding tropes view, tropes are tied together to form bundles by binding tropes. On this view, any two tropes that are bound together are bound by a binding trope. Since it has been argued that it is unreasonable to accept that tropes can exist singly and that there is a need for a real binder to bind tropes to form substances, it follows that binding tropes must also be bound. Naturally, they must be bound by binding tropes. But, if each binding trope must be bound by another binding trope an infinite regress will arise and this regress creates two serious problems.

First, a successful binding between any two tropes will presuppose the successful binding of other tropes, which in turn presupposes the successful binding of other tropes, and so on into infinity. For example, for A and C to be bound by binding trope B1, B1 must be bound to A by binding trope B2 and to C by binding trop B3 and B2 must be bound to A and B1 by B4 and B5, and so forth, into infinity. Thus, the binding of tropes cannot occur because no binding can ever be successful, which is rather problematic.

Second, even if the bindings were to occur, there would be an infinite number of binding tropes for each binding, which would be rather uneconomical.

The only way to stop the regress and avoid these two problems is to accept a binder that need not be bound. Since it is unreasonable to accept that tropes can exist singly, which would be the case if tropes could exist unbound, it follows that it is unreasonable to accept that binding tropes need not be bound. After all, if tropes did not need to be bound, there would be no need to accept binding tropes. A bundle theorist could simply claim that binding tropes, unlike all other tropes, need not be bound. However, such a move would be *ad hoc*. Further, one might suspect that if binding tropes are so different from other tropes then they might well be a separate ontological kind that serves to bind properties. In other words, one might well suspect that such binding 'tropes' are actually substrata.

[9] A view somewhat similar to this is endorsed by C.B. Martin. He takes being a supporter of properties to be a property, but he takes this property of supporting properties to be a substratum. See 'Substance Substantiated', *op. cit.*, pp.5-6.

While the bundle theorist faces a serious problem here, the trope-substrata theorist also faces a similar problem. On the trope-substrata view, tropes are bound together by substrata. The binding that holds between tropes and substrata cannot be a trope, because this would give rise to a regress very much like the one the bundle theorist faces. What a trope-substrata theorist must do is take the binding between tropes and substrata to be a primitive.

If the trope-substrata theorist can take the 'relations' between tropes and substrata to be a primitive, then it might be suspected that the bundle theorist can take the bundling of tropes into groups to be a primitive. If this is the case, then bundle theory would retain its advantage in ontological economy and this would provide a good reason to reject a trope-substrata view in favour of a bundle of tropes view. However, this is not the case.

A bundle theorist who accepts binding tropes might attempt to solve the regress by claiming that the binding tropes themselves do not need to be bound and that this is simply a brute fact or primitive. However, this would be *ad hoc*. Since binding tropes are tropes, it would be unprincipled to simply claim that it is a brute fact that they have a special status that makes them distinct from all other tropes. The only reason to accept this claim is to avoid the problem, which is hardly a non *ad hoc* reason. In the case of substrata, it is not *ad hoc* to claim that they need not be bound like tropes. This is because substrata are, unlike binding tropes, not tropes. Thus, the price of avoiding the regress requires accepting primitive binding 'relations' which hold 'between' tropes and substrata.

It might be argued that rather than accepting substrata and taking the bindings to be primitive, it would be more economical (and hence more reasonable) to simply take the bundling of tropes to form substances as a primitive. While this view would be economical, the theorist accepting it would have to reject Plato's mark of being or provide arguments to the effect that there is no need to accept a real being to account for binding. However, given the plausibility of Plato's mark and the fact that is reasonable to accept the need for a real binder, such a view would not be particularly plausible.[10]

Armstrong's Argument for Substrata

In *Universals,* David Armstrong contends that a trope-substrata view is superior to a bundle of tropes view. In support of this position he argues that tropes are not suitable to be the substances of the world. In the case of relations, this is rather obvious. After all, it makes no sense to speak of relations existing apart from what they relate. Armstrong also considers property tropes to be incapable of being substances, since tropes are not the sort of entities that can exist singularly. For example, it seems quite unreasonable to believe that a particular mass could exist on its own. Armstrong notes that bundle theorists often give their tropes spatial and temporal characteristics as well as shape, duration and size. As he notes, 'the theorists are then embarrassed because shape, size, and duration appear themselves to be properties and therefore ought to be tropes alongside other property tropes'.[11] Thus, it would seem that tropes simply will not do as substances.

[10] Since the mark of being principle and the need for a real binder were argued for above, no additional arguments are presented here.

[11] *Universals* , p.115.

While this presents a problem for the bundle theorist, it seems that a trope-substrata theorist has as much trouble over the substantiality of a substratum having only a single property as does a bundle theorist over a single trope. A substratum with a single trope bound to it does not appear to be much more substantial than a single trope existing on its own. After all, if it is unreasonable to believe that a particular mass can exist on its own, it seems equally unreasonable to accept that a substratum with only a single mass trope can exist. Hence, it should be concluded that while a single trope is not suitable as a substance, neither is a substratum with a single trope.

A substance will have to be a fairly robust sort of complex entity, consisting of multiple tropes on a bundle view and consisting of multiple tropes and a substratum on the trope-substrata view. This view of substances raises two very important questions, which cannot be answered here. First, what constitutes a minimal substance? In other words, what are the simplest sorts of substances that can exist? In the context of modern physics, these simplest substances would probably be the most basic particles or perhaps the most basic fields. Unfortunately, more cannot be said on this issue due to the limited scope of this work. Second, what is it that 'programs' the binders to form these minimal entities? In other words, what is it that serves to prevent tropes from existing singularly? This question is similar to another problem involving relations between properties. One interesting feature of reality is that there are

> necessary connections at the determinable level associated with contingency between determinates. Sounds, for example, have volume and pitch. These can vary independently, suggesting we are dealing with different tropes, yet every volume must be a volume at *some pitch or other*, and every pitch must have *some volume or other*. Shape and size are a familiar pair of the same sort. The purity and hue of colours are another.
>
> I have no account of the metaphysical, rather than logical, necessities which seem to be involved here. Nor, I suspect, does anyone else. But whatever the correct account might be, there is no reason to think it will tell against abstract particularism and in favour of realism about universals.[12]

In the case at hand, it seems that there is currently no account of just why properties cannot exist singularly. However, there is no reason to suspect that such an account will count in favour of a bundle view and against a substrata view. In all fairness, it must also be said that there is no reason to suspect that such an account will tell against the bundle view in favour of the substrata view. In light of these results, it should be concluded that Armstrong's first argument does not tell against bundle theory in favour of a substrata view. However, his argument does indicate the need for robust substances.

Armstrong's second argument rests on the assumption that there are second order properties. On a trope view, both first, second and higher order properties are tropes. Armstrong begins his argument by asking what it would be, on the bundle view, for a first order trope to have a second order trope. He then asks if it should be accepted that a first order trope is only a bundle of properties. Armstrong takes this position to be 'very

[12] *Abstract Particulars,* pp.70-71.

unattractive'[13] and claims that a 'substance-attribute model of the relation of a first order trope to its property seems much more inviting'.[14] So, if a trope counts as a substratum *vis-a-vis* its second order properties, then why not also adopt the substratum-attribute model at the base level, too? If Armstrong is right, a trope-substrata view should be accepted over a bundle of tropes view.

III. The Defence of Substrata

One powerful motivation for accepting a bundle view over a substrata view is the weight of the problems that substrata are supposed to suffer from. In order to make it reasonable to accept a substrata view over a bundle view, these problems need to be addressed.

The Empiricists' Challenge

The empiricist tradition includes a stock argument against substrata. This argument was first presented by John Locke[15] and similar arguments were used by George Berkeley against material substance[16] and by David Hume against both material and immaterial substances.[17] In each of these cases, the term 'substance' was used to refer to what the term 'substrata' is generally taken to refer to, since they were attacking that which they took to be the supporter of properties[18] and what is taken in this work to be the binder of tropes. Their argument can be presented in the following, generalized form: whatever is known about things is known in terms of, or by means of, their properties. Since substrata are supposed to be the binders of properties and not properties themselves, they cannot be known. Since they cannot be known, to posit the existence of substrata is to engage in unjustified speculation, and hence should not be done.

A related argument with a milder conclusion is as follows: properties are, for the most part, well and clearly understood and are experienced everyday. In stark contrast, that which is supposed to bind these properties is neither clearly nor well understood and they never seem to be experienced. They are, it must be concluded, mysterious sorts of entities ('unintelligible chimeras', as Hume would put it). Hence, it is concluded that the mysteriousness of substrata provides a reason to reject them and at least raises the cost of accepting them.

One way to address this challenge is to argue that a substratum has a property of binding properties by which it may be known. While accepting binding tropes that all substrata possess would serve to avoid the empiricists' epistemic challenge, it would also lead to a problematic regress. Suppose that there are binding tropes that substrata possess and that tropes need to be bound by substrata.[19] Since binding tropes are tropes

[13] *Universals,* p.127.
[14] *Universals,* p.127.
[15] J. Locke, *An Essay Concerning Human Understanding* (ed.) P.H. Nidditch (Oxford: Clarendon Press, 1979) pp.174-175.
[16] G. Berkeley, *Three Dialogues Between Hylas and Philonous* (ed.) R.M. Adams (Indianapolis: Hackett, 1979) pp.22-93 and G. Berkeley, *A Treatise Concerning the Principles of Human Knowledge* (ed.) K. Winkler (Indianapolis: Hackett, 1982) pp.23-26.
[17] D. Hume, *A Treatise of Human Nature* (ed.) L.A. Selby Bigge, 2nd edn, revised by P.H. Nidditch (Oxford: Clarendon Press, 1978) pp.15-17.
[18] I use the term 'bind' since I prefer the metaphor to the support metaphor. The distinction between supporting and binding need not be of concern here.
[19] If properties did not need to be bound by substrata, there would be no need for substrata.

it follows that they need to be bound to substrata. Thus, the initial binding trope would have to be itself bound to the substratum and the trope that binds it would also have to be bound, and so on, into infinity. Since the binding of trope *n* to a substratum depends on the binding of trope *n* +1 to a substratum and so on, it follows that tropes can never be bound to a substratum since the required initial binding requires an infinite number of steps to occur. Even if such a binding could occur, each binding would require an infinite number of binding tropes, which is rather uneconomical. Hence, it would be reasonable to not postulate such binding tropes and keep the binding capacity of substrata a primitive. Of course, this leaves the empiricists' challenge unanswered.

In *Principles of Philosophy*, Descartes addresses a difficulty very similar to the empiricists' challenge just presented. His problem is to provide an account of how substances may be known and he offers the following solution:

> However, we cannot initially become aware of a substance merely through its being an existing thing, since this alone does not of itself have any effect on us. We can, however, easily come to know a substance by one of its attributes, in virtue of the common notion that nothingness possesses no attributes, that is to say, no properties or qualities. Thus, if we perceived the presence of some attribute, we can infer that there must also be present an existing thing or substance to which it may be attributed.[20]

Descartes argues that the existence of a substance (that which bears properties) can be known via inference. If it is known that properties cannot exist without existing as the property of a substance, and it is known that properties exist, it can be inferred that substances exist. While substances can not be known directly, they can known by inference. Unless one is willing to deny knowledge by inference, it would seem that Descartes' argument is reasonable.

In the case of substrata, the following argument can be given. If the empiricists are correct and only properties can be known, then direct knowledge of substrata is not possible. However, substrata can be known by inference. Given that it is reasonable to accept that tropes cannot exist singly and that they need to be bound by substrata to form substances, when the presence of some property is perceived, it can be inferred that there must be a substratum present to which it is bound. Thus, substrata can be known by inference and the empiricists' challenge is countered.

Bare Substrata and Individuality

An objection against substrata is as follows. Either substrata have properties of their own, over and above those they bind, or they are without properties of their own, distinct from those they bind. If substrata have properties of their own, it would still be the case that they are bare 'under' their properties.[21] Hence, it seems the only option is to take substrata to be bare and this gives rise to two serious difficulties. First, since substrata are bare, it would seem that they would lack the capacity to bind properties. However, if

[20] *The Philosophic Writings of Descartes*, p.210.
[21] This seems to be a tautology.

substrata cannot bind properties, then there would be no good reason to postulate them as being the binders of properties. Second, since substrata are bare, there are no qualitative differences among them. However, since there are supposed to be numerous substrata, an account must be given of their individuation which involves no appeal to qualitative differences.

The first problem can only be addressed by taking the binding ability of substrata to be a capacity that is not to be thought of as a property, for the reasons given above. As noted above, part of the price of accepting substrata is taking their binding capacity to be a primitive. While the price of accepting this primitive is high, the alternative is even less appealing. As argued above, accepting binding tropes results in two very serious regresses which seem more costly than accepting substrata. Hence, in order to meet the need for a real binder, the most viable option is to accept substrata.

The second problem, that of individuation, is addressed in the following manner. The individuation of substrata must be taken as a primitive. While such a move increases the cost of the trope-substrata theory, all theories concerned with individuation must take individuation as a primitive at some level. The argument for this is as follows. Suppose that the individuality of an entity is not taken as primitive but is instead analyzed. Suppose that X (where x is the individuator) individuates entity a. Now, either X itself must be individuated or its individuality must be taken as primitive. If X's individuality is analyzed in terms of Y, then either Y's must be individuated by something else or its individuality is primitive. And so, on, *ad infinitum*. The only way to stop the regress is to accept individuation as a primitive at some level or to admit an individuator that itself need not be individuated. If something is self individuating, then a requirement regress arises. For X to individuate itself requires that X be an individual; for it to be an individual, it is required that it individuate itself. For example, suppose that individuation were taken to be a property such that entities which had this property were individuals. The question immediately arises as to what individuates this property from all others. If it is claimed that it individuates itself, a requirement regress arises and hence this reply is inadequate. Suppose that it is replied that the property of individuation is individuated by its power of individuation. Once this is accepted, there seems to be no principled way to deny that other properties can be individuated by their powers and hence there is no need for the property of individuation. The question then arises as to what individuates powers, and the question can arise again for the answer to this question. As such, there can be no self individuating entities and individuation must be taken as a primitive at some level.

Because individuation must be accepted as a primitive at some level by all theories, including the bundle of tropes view, which involve individuals, the primitive individuation of substrata does not count against it any more than the primitive individuations required by competing theories, such as the bundle view. Thus, it may be concluded that the need to accept a primitive individuation is not a special problem for the trope-substrata theory.

Change and Destruction

In *Abstract Particulars*, Keith Campbell presents the following objection against the existence of substrata:

> All causal action is exerted by way of the properties of things and all effects are effects on the properties of things. The substratum, precisely because it is without properties, including passive powers, ought to be *totally immune* to all causal activity. *A fortiori*, it ought to be unscathed by every destructive process. Yet if we introduce metaphysically indestructible substrata, we are undertaking *a priori* natural philosophy of a most discreditable kind. What items can you produce or postulate, belonging to the natural order, that are *necessarily* immune from destructive alteration?[22]

There are two ways out of Campbell's objection. The first is to assert that each substratum has an essence, which would be a trope that it has necessarily. If this essential trope were to be destroyed, then the substratum would also perish. For example, on a Cartesian view, extended substances would consist (at least) of a substratum with an extension trope. Were the extension of an extended substance to perish, then it would seem likely that the entire substance would perish. A second way out is to accept that no substratum can ever be bare in the sense of being tropeless. On this view, to lose a trope is always, necessarily, to gain a new one. On this view, the indestructibility of substrata would no longer be an objection.[23] This view is supported by the fact that a bare (tropeless) substratum would (like a singular trope) not be at all suited to be a substance. After all, if it is unreasonable to accept that a single mass trope can exist on its own, it seems equally unreasonable for a single binder of tropes to exist on its own. Thus, it would seem that tropes and substrata are mutually dependent, in the sense that neither kind can exist apart from the other kind. Hence, a minimal substance would be a substratum and the set of tropes it binds.

IV. Conclusion

In light of the above arguments, the most reasonable form of trope theory to accept is a trope-substrata view. The most plausible version of a trope-substrata view is one in which substrata are taken to be tropeless (in the sense that they have no tropes except those they bind) and bind tropes in virtue of being binders of tropes and not in virtue of possessing a binding property. This is to say that the binding capacity of substrata is a primitive. Finally, since substrata (like tropes) are not suited to be substances, it is reasonable to accept that substrata cannot exist without tropes. Tropes also cannot exist without substrata to bind them, hence the existence of substrata may be inferred from the existence of tropes.

Florida A. and M. University

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[22] *Abstract Particulars*, p.9.
[23] These two replies must be credited to an anonymous referee.