Properties and Resemblance Classes

David Manley
Rutgers University

There are two major theories of properties that employ resemblance classes to avoid commitment to universals.[1] Object-resemblance nominalism (ORN) faces the notorious *companionship* and *imperfect community* difficulties, though some costly remedies have been proposed. Trope-resemblance nominalism (TRN), in contrast, is commonly supposed to avoid these difficulties altogether. My contention is that *both* versions of resemblance nominalism are subject to companionship and imperfect community difficulties. If I am right, (1) trope theory loses one of its primary selling points, and (2) resemblance nominalists of either type must appeal to the troublesome remedies that I discuss below.

I. The Very Idea of a Property Class

ORN is an object-class theory of properties—it teaches that classes of objects can play the roles that properties play in our understanding of the world. In general, wherever we have irreducible need for reference to (or quantification over) a property, there is a class of objects called a "property class" suited to be the subject of our discourse. For instance, the abstract singular term "redness" refers to the class of all the objects to which the corresponding general predicate applies. As a result, the claim "Redness is a color" can be analyzed as stating that the class of red things is a subset of the class of colored things.[2] It follows from this analysis of quantification over properties that an assertion to the effect that a number of objects "are of the same kind" (or "share a property" or "have a feature in common") can be understood as asserting that there is at least one property class of which all of the objects are members. As for the sentence "There are several unique features of mollusks", object-class nominalism takes it to be asserting that several property classes have only mollusks as members.

There is other work that a theory of properties might be called upon to perform. Some believe that properties are the objects of thought, or provide a foundation for nomological and metaphysical modalities. Some believe that properties must provide the resources for a reductive analysis of predication. Now classes of objects may perform certain of these tasks poorly—indeed, I think they do—but this will hardly matter to a class nominalist who does not call on properties to play these roles. David Armstrong has attacked class nominalism on the ground that it does not provide a satisfactory analysis of the predicative schema "*a* is *F*".[3] But many class nominalists remain unconvinced that "*a* is *F*" *requires* further analysis.[4] In short, class nominalism as a theory of properties is distinct from the thesis that, for a given predicate *F*, *what it is to be F* is to be a member of a certain class. (For what it's worth, I agree with those who think this would be a dubious account of predication.)

Whether a theory of properties must provide a reductive account of predication in general is a contentious issue—and one I will not settle here. But there is work for a theory of properties that most of us can agree on. So, following David Lewis, I will take the mandatory "One over Many" challenge to be, not that of analyzing predication in general, but that of explaining what it is for distinct things to "be of the same kind" (or "have a feature in common", etc).[5] As we have seen, this is an instance of the broader Quinean challenge of accounting for true sentences that irreducibly refer to or quantify over properties. I have no quarrel at present with those philosophers whose criteria are more stringent: it should interest them to consider whether class nominalism is worthy even of this modest task. For if it fails in this, it fails *simpliciter*.

The object-class nominalist, then, believes that a property class is the class of all and only the objects with a certain property. But we can hardly define property classes this way without circularity. On the other hand, if we allow unrestricted formation of property classes, so that every class (however gerrymandered) can in some sense be called a property, we have yet to explain the difference between classes that can be identified with genuine kinds and those that are heterogeneous. Simply put, there are far too many classes of things for shared membership in any old class to be the last word about property-sharing. We must account for the fact that the class of all and only red things is more special (or "natural") than the class of red-or-reptilian things.[6] Until we have done so, we do not have an adequate theory of properties. Call this the "Problem of Naturalness". One approach to this problem takes the naturalness of some classes as primitive. We will return to that strategy, but many suspect it leaves off the analysis of properties too early, and that it would be preferable to take the theory a step further.

Enter ORN, which analyzes natural classes in terms of the common-sense notion of *resemblance*. According to ORN, it is in virtue of the way red things resemble one another that they all gain membership in a property class. Only a *resemblance class* can serve as a natural property; and for any class, the degree to which its members resemble each other is the degree to which it is

natural. Membership conditions for resemblance classes, then, must (i) specify nothing other than greater or less resemblance among things and (ii) ensure that one of the many resemblance classes formed will be the class of red things. (*Redness*, while not perhaps perfectly natural, is more natural than *being-red-or-reptilian*.) The most elegant way to form resemblance classes was proposed (in essence) by Carnap and has been refined by other philosophers:[7]

> A class of objects is a resemblance class if and only if (1) each member of the class resembles every other to some degree; (2) no non-member resembles every member of the class to that degree.

Thus the class of all and only red things forms a resemblance class, for there is some lowest degree to which each red thing resembles every other, and given the variety within the huge class of red objects, no single non-red thing resembles every red thing to that degree.[8]

II. Troubles With Object-Resemblance Nominalism

Nelson Goodman coined the terms "companionship" and "imperfect community" for two serious problems with ORN thus conceived.[9] To illustrate the *companionship problem* (CP), consider a possible (though remote) state of affairs: the only red things in the world are spherical, and all the spheres in the world are red. In these circumstances, the property *being spherical* is identical with *redness*, since ORN replaces each of these with the class of red tropes. Or, to use one of Keith Campbell's examples, suppose that all and only pandas eat bamboo. Then ORN entails that *being a panda* and *being a bamboo-eater* are the very same properties. But, of course, they are distinct—whether or not there happen to be any non-panda bamboo-eaters around. So there are too few resemblance classes to play the role of properties.

The *imperfect community problem* (IC) can take two forms. In its familiar form, IC returns us to the Problem of Naturalness: it points out that some of the classes formed by our conditions are not natural after all. Consider Y, the class of all soft yellow things, all round yellow things, and all round soft things.[10] Y meets the criteria we laid down for resemblance classes, since each member resembles every other to some degree, and no non-member resembles each member to that degree. Further, the degree of resemblance between each pair of Y's members is comparable to the degree of resemblance between each pair of yellow things. But Y does not have any significant degree of naturalness, since the only candidate for the property that all and only members of Y share is a disjunctive, gerrymandered property. So there are resemblance classes that cannot serve as natural properties: ORN gives us too many classes in this case, and we are faced again with the Problem of Naturalness.

While classic formulations of IC focus on the "too many classes" problem, a new variation on IC gives us another, equally troublesome result. Consider

a possible world with only three objects in it. The first object is soft and yellow (*sy*), the second is round and yellow (*ry*), and the third is round and soft (*rs*). Suppose we want to construct a resemblance class in this world with which to identify the quality *yellowness*. Naturally, we want the class {*sy*, *ry*} to be what "yellowness" refers to. But {*sy*, *ry*} is not a resemblance class, because *sy* and *ry* both resemble *rs* just as much as they resemble each other. There is no way to keep the round and soft object out of the class as we try to construct a class of yellow things, so there can be no resemblance class with all and only yellow things as members. Call this element of IC the "restricted worlds" problem. The fact that it only arises in restricted worlds is not a mitigating factor: it's bad enough that *possibly*, in a world where there are yellow things, there is no resemblance class corresponding to *yellowness*. Any satisfactory theory of properties must be applicable in all worlds where properties are shared.

I have shown how these difficulties apply to the criteria for forming resemblance classes that were considered in the previous section. However, resemblance classes can also be constructed based on the members' resemblance to paradigms (or "exemplars"). There are two ways of constructing the criteria of membership for paradigm resemblance classes.[11] (i) H. H. Price suggests that all members must resemble the paradigms (for the class of red things, "a certain tomato, a certain brick and a certain British post-box") at least as closely as the paradigms resemble each other (Price, 32). (ii) An alternative version might stipulate that the members of a class resemble all the paradigms more than any non-member resembles all the paradigms.

But both versions of paradigm-ORN are equally vulnerable to the two difficulties. CP: Suppose again that all red things in the world are spherical and all spheres are red. Then a few of those spheres would have to be the paradigms of *redness*. And some other spheres (or perhaps the same ones) would be the paradigms of *sphericity*. But on either criterion mentioned above, the class of all red things just is the class of all spheres in this possible world, and so *redness* is identical with *sphericity*. IC: Paradigm-resemblance classes that are not very natural can be formed using a high degree of resemblance among paradigms that do not all share a natural property. Suppose we pick a soft yellow thing, a round yellow thing, and a round soft thing: we will have specified the very class that gave us trouble before. So paradigm-ORN does not give us a principled way of distinguishing between natural and non-natural property classes. Once again we cannot stipulate that natural classes are those formed by using (a large enough number of) paradigms that all *share a natural property*, since that would be circular.

As for the "restricted worlds" problem, consider the world with only the objects *sy*, *ry*, *rs*. What will serve as the paradigm for yellowness? It cannot be both *sy* and *ry*, because picking out all the yellow objects in the world to serve as paradigms for the yellowness class is circular. This leaves us with one of the yellow objects as the paradigm. As a result, however, we can no

longer use criterion (i), since the clause "as closely as [the paradigms] resemble each other" when applied to a single paradigm is either meaningless or would impose exact resemblance with that paradigm as a condition for membership. Criterion (ii), however, can be fitted to a single paradigm: we can define the class of yellow things as all of those things that resemble the paradigm more than any non-member does. Which yellow object we pick should be of no consequence, so let us choose *sy*. But each of the two non-paradigmatic objects resembles *sy* as much as the other one does: if *ry* is to be a member of the yellowness class in virtue of resembling our paradigm, *rs* must be a member of that class also.

To sum up the difficulties (both for paradigm-resemblance classes and ordinary ones): sometimes one resemblance class must take the place of two or more properties (CP); many resemblance classes are not natural (IC); and there are cases of property-sharing (at least possibly) for which no resemblance class exists at all (my "restricted worlds" version of IC).

III. Trope-Free Solutions

Other ways to construct property classes out of objects have been proposed as solutions to these difficulties. In order, we will consider (1) classes of *possibilia*, (2) primitively natural classes, and (3) classes grouped by a relation other than the ordinary resemblance relation described above. The first option mitigates (but does not entirely solve) CP, while the second and third solve IC. Each solution has its costs, which I will not discuss at length. Most importantly for my purposes, each solution is equally available to trope theorists. As a result, when it is shown that trope theory does not in itself overcome CP and IC, we will have reason to think that these solutions are the only ways of salvaging class nominalism of either persuasion. Thus, whatever costs or benefits accompany them are as damaging or as helpful to trope-class theories as they are to object-class theories.

(1) *Modal Realism*. Since it countenances *possibilia* in its ontology, modal realism allows possible objects to be members of resemblance classes. As a result, it neatly avoids CP in the vast majority of cases. To be red is to be a member of the class of all possible red things, and there are always possible red things that are not spherical, no matter how restricted the actual world is. One might argue that there are distinct but necessarily co-extensive properties, such as *being an equilateral triangle* and *being an equiangular triangle*, but it is hard to show that these really are distinct.

Does modal realism solve IC? Yes and no. It avoids the results of our restricted worlds version of IC, *viz.* our inability to form a resemblance class of yellow objects in certain possible worlds. The "too many classes" problem, however, is one that even the modal realist must face: the class of all possible yellow and soft things, all possible yellow and round things, and all possible

round and soft things fits our criteria for resemblance classes and yet is not intuitively a *kind* of any sort.

(2) *Primitively Natural Classes*. I mentioned above that one type of object-class nominalism refuses to analyze the naturalness of classes at all. It accepts unrestricted formation of classes and degrees of naturalness among them, but takes the predicate "natural" as primitive. As a result, IC in both its forms is avoided: the predicate applies to the right classes and not to the wrong ones, and that's that. This view does not, however, solve CP: in a world where all and only red things are spherical, the same class gets identified with the properties *redness* and *being spherical*. The class may be primitively natural, but it is still only one class in place of two properties.

One trouble with this view is that taking a proposed analysandum as primitive should always be a last measure, and therefore a working resemblance-class nominalism (if one is possible) would be preferable. Like realism, resemblance classes provide a potentially illuminating answer to the question at hand, which is: what (ontologically speaking) *makes* property classes natural? The second problem with (2) is that it leaves us with a primitive metaphysical predicate applied to *classes* that cannot be analyzed in terms of their *members*. Intuitively, however, it ought to be something about their members that makes classes natural.

(3) *A New "Resemblance" Predicate*. Another way to avoid IC (but not CP) is to assert that natural classes are formed by virtue of some unanalyzable relation distinct from the common-sense dyadic resemblance relation we have been considering. For example, David Lewis points out that a variably polyadic predicate would do the trick, and others (Hausman and Rodriguez-Pereyra) have offered other primitive "resemblance" predicates that are up to the task of defeating IC.[12] Nevertheless, it is debatable (and, I think, doubtful) whether any of these has a good claim to being a legitimate extension of the common-sense notion of resemblance.[13] If this is true, we could simply leave the concept of resemblance behind and consider the predicate as unanalyzably doing the work that is pre-theoretically captured by "x_1, x_2,... all share a property not shared with anything else". Granted, we cannot form any non-circular (extra-systematic) understanding of how the predicate works, but we could still avoid circularity by taking it as primitive.

Is this approach any better than solution (2)? The reason ordinary ORN (if successful) is preferable to solution (2) is that ORN can offer an explanation what it is in virtue of which things form natural classes, while (2) cannot. But the present proposal, while theoretically sound, does not have this advantage over primitively natural classes. Both the predicates "natural" and "x_1, x_2. ... all share a property not shared with anything else" can only be understood in terms of property-sharing, and so neither allows us to grasp the metaphysical basis of its own success in providing an extensionally correct definition of non-heterogeneous classes. Instead, in order to understand the predicate, we find ourselves using (extra-systematically) the very notion of property-sharing that

the predicate is supposed to explain. In short, the kind of conceptual reduction offered by ordinary resemblance is no longer available. The question remains: does it constitute progress in explanation to go from taking as primitive the naturalness of classes to taking as primitive an artificial predicate that (by *fiat*) applies to all the *members* of a natural class? Put that way, it's unclear whether the difference between these two solutions runs very deep at all.[14] One advantage for a predicate of this sort, perhaps, is that it would apply to the *members* of classes, and thus would avoid the second objection to solution (2).

A note concerning terminology is in order. It should be apparent that solution (2) is not a variety of resemblance nominalism at all, since it does not employ the notion of resemblance. Whether or not solution (3) deserves the name of *resemblance* nominalism is an open question.[15] But this much is clear: if these two solutions are the only ways of avoiding IC, the game is up for classical ORN with its ordinary dyadic resemblance relation.

IV. Trope Theory as a Solution

Expositions of CP and IC often point out that they are neatly sidestepped by trope-resemblance nominalism, without any recourse to the solutions considered in the previous section.[16] And trope theorists invariably take this evasion as a motive for adopting a trope ontology. D.C. Williams puts it this way:

> All the paradoxes which attend the fashionable effort to equate the universal Humanity, for example, with the class of concrete men (including such absurdities as that being a featherless biped is then the same as having a sense of humor) disappear when we equate it rather with our new set, the class of abstract humanities—the class whose members are not Socrates, Napoleon, and so forth, but the human trope in Socrates, the one in Napoleon and so forth. (Williams 1953, 10)

And he is right, as far as this example goes.

Nicholas Wolterstorff and Keith Campbell argue that what makes CP work against resemblance classes of concrete particulars is the *complexity* of those concrete particulars (Wolterstorff 208; Campbell 33). Object-class nominalism conflates properties like *yellow* and *soft* whenever each yellow thing in a world is soft, and vice versa; the only possible resemblance class is a class of objects $\{sy, sy,...\}$, where each "*sy*" is a soft yellow object. According to trope theory, however, the relevant aspects of a given yellow and soft object are two co-located tropes y and s, so it provides us with the classes of tropes $\{y, y,...\}$ and $\{s, s,...\}$ to serve as property classes.[17] Hence, according to Campbell, "the inability to distinguish different but coextensive properties... does not arise where it is not concrete particulars, but tropes that are involved" (33–34). David Armstrong, too, joins the ranks of those who consider TRN "the most plausi-

ble of all forms of Nominalism" (1989, 17), partly because he thinks it over-comes CP (which he calls "the coextension problem": 1989, 125–126).

Campbell and Wolterstorff likewise consider TRN impervious to IC. In Campbell's words, "there will not be any similarity circles with hybrid members, and it is only hybrid members that allow the construction of similarity circles exhibiting imperfect community" (34). We saw that in our restricted worlds example, the object-class nominalist could construct only one resemblance class: {*sy*, *ry*, *rs*}. Trope theory, in contrast, separates these pairs of property instances and gives us the resembling classes of tropes {*yy*} {*rr*} and {*ss*}. Again, the simplicity of tropes is supposed to salvage the strategies of resemblance nominalism.

It stands to reason, of course, that if trope theory can evade our difficulties, nominalists have at least one good reason for adopting it. And standard trope theory does solve the CP and IC examples that have been presented against ORN. However, the essence of CP is that resemblance classes conflate attributes that are intuitively distinct, and the essence of IC is that the criterion for the construction of resemblance classes fails adequately to gather all and only things with a certain property together. To show that trope theory falls prey to these difficulties, new examples geared towards tropes must be formulated.

Before turning to the new examples, I should stress that they are leveled against the standard version of TRN, according to which only determinate tropes exist, but each trope is a member of many resemblance classes formed by different degrees of resemblance. This is TRN as it has been presented by its adherents, and it is appropriate at this point to clarify some of its features. Following Williams, consider a lollipop ("Heraplem") of a precise shade of red ("mandan red"). According to standard TRN, Heraplem has only one color trope, which we may call "Harlac", that exactly resembles every other mandan red trope (Williams 1986, 7). *Mandan redness* itself is just the class of tropes "precisely similar" to a given mandan red trope, while less determinate qualities like *redness* and *coloredness* are classes composed of the tropes "approximately similar" to it (Williams 1953, 9). There are no color tropes in Heraplem aside from the most determinate one, Harlac, which is a member of as many resemblance classes as there are determinable color properties. It is in virtue of Harlac's membership in this multitude of classes that Harlac does all the work for Heraplem's color properties at every level of generality.

So according to standard TRN, tropes are things like determinate shapes and colors, and these ground reference to properties at all levels of generality. As G.F. Stout put it, "We take shape in general as the name of a class of qualities, and 'squareness' as the name of a sub-class. Squareness then simply means the special sort of shape which we call square" (118). The narrowest properties are resemblance classes in which membership requires *exact resemblance* with the other members, while more general properties are resemblance classes governed by lesser degrees of resemblance.[18]

V. The Companionship Problem Again

Standard trope theory falls prey to a version of CP that concerns coextension between specific and general attributes. Consider a possible world where all objects are red. Here the class of colored tropes and the class of red tropes coincide exactly. In the actual world, of course, they do not, so the trope theorist seems to have succeeded in distinguishing *redness* from *coloredness*. In a restricted possible world, however, these collapse into the same property.[19] But they are necessarily distinct properties, since things can be colored without being red. So the fact that this difficulty seems only to arise in restricted worlds is irrelevant, just as it is in some of the CP examples we brought to bear against ORN.[20] This is trope theory's version of the companionship problem (or "TCP").

Biting the bullet with respect to TCP would involve acknowledging that, possibly, these properties are identical. But perhaps this not as bad as it sounds. The trope theorist might respond as follows:[21]

> Any variety of resemblance nominalism must admit that, had there been one less red thing in the actual world, the term 'redness' would have picked out an entirely different resemblance class. This is because, for anyone who does not countenance *possibilia*, the essence of a property class is dependent on actual particulars. Since 'redness' and 'coloredness' do not rigidly designate classes, it should not be so surprising that, though they happen to pick out different properties in the actual world, they could have designated the same property. What's more, the possibility that 'redness' and 'coloredness' could refer to the same property is more plausible than that 'being a featherless biped' and 'having a sense of humor' could. For *redness* and *coloredness* have at least a one-way necessary connection in the actual world, the relation between determinate and determinable.

This line of reasoning, however, does not overcome the main force of TCP. For the central point of the original CP examples was to show that property names *cannot* refer non-rigidly to classes. The trouble arises precisely because non-rigidity allows for a kind of "contingent identity" among properties. Ordinarily we are happy to recognize that two non-rigid definite descriptions can contingently apply to the same thing: there is nothing odd about saying that the tallest woman alive just happens to be the smartest person alive. But there is something (prohibitively) odd about saying that *redness* just happens to be the very same property as *being spherical*. For the same reason, we cannot allow that *redness* could ever be the very same property as *coloredness*. The one-way necessary connection between the two latter properties is not relevant to the intuitive ban on the possible identity of distinct properties.

What makes things worse is that, according to TRN, the distinctness of properties often depends on things that ought to be completely external to the issue.

For as long as there are non-red things in the world, redness and coloredness are distinct properties. But if the furniture of the world were reduced (because God decided to take all non-red things out of it one by one), redness and coloredness would become identical as soon as the last non-red thing were removed. In a world full of things like bricks and British post-boxes, the two properties are identical, and this because there are no taxi-cabs about. The result, it seems to me, cannot be accepted.

VI. The Imperfect Community Problem Again

Recall that, on the standard version of trope theory, a single determinate color trope does the work for all the determinable color-properties had by the object with that trope. Now consider a world in which there are only three things (trope-bundles) with a single determinate color-property each: one is pink, one is baby-blue, and one is a deep purple. The proper names of the color tropes in this world are "Pink," "Baby-blue," and "Purple," respectively. And each of these tropes resembles every other. Pink and Purple are both reddish, Purple and Baby-blue are both bluish, and Pink and Baby-blue are both pale. Therefore, according to the conditions for resemblance classes that we have examined, all three tropes are members of a resemblance class. But what property does it correspond to? Perhaps, under the limited circumstances, our resemblance class is *coloredness* in general. In that case, which resemblance class will we identify with *being bluish*? We cannot construct a resemblance class for the two bluish colors without also including Pink. After all, we must simply rely on a certain degree of resemblance that each of the two bluish color-tropes has towards the other, but not to Pink. Unfortunately, there is no such degree of resemblance. As soon as we reach a degree that will allow the bluish colors into the same class, Pink sneaks in as well because it resembles both Purple and Baby-blue in some respect (and to the same degree that they resemble each other). The same goes for trying to construct a resemblance class for either of the other shared properties. Each time we try to pair up any two tropes on the basis of a *certain* similarity, the third pops up due to what seems to be an irrelevant similarity. And yet degrees of similarity is all we have to go on.

Though the example we have given causes trouble all by itself, it can also be given in a way that does not employ restricted worlds. Consider the resemblance class of tropes (in the actual world) that has as members all and only the pink color tropes, the baby-blue color tropes, and the purple color tropes. These all resemble each other to a good degree and no non-member resembles each of them to that degree. But this is no property class worthy of the name "natural."

Before turning to a possible reply, let me give an example using the other type of trope commonly used in the illustrations of trope-theorists: the determinate shape trope. Consider a world with only three objects: an equilateral triangle, a square, and a right triangle. (For simplicity's sake, they are planar

figures.) Let the letters "A", "B", and "C" name the shape tropes of these objects, respectively. On standard trope theory, A will stand in various resemblance classes, one for each shape property that can be applied to the equilateral triangle. So the property *triangularity* should be a class of loosely resembling tropes, one of which is A.[22] (The same should be true of *equilaterality* and *shapedness*.) Now, intuitively each of these shape tropes resembles every other one: A and B are both equilateral; A and C are both triangular; B and C each have perpendicular sides (and an interior right angle). None of these tropes, however, shares any of the relevant attributes with *both* of the others. So none of the shared properties can be constructed as a property class out of only two of the shape tropes in this world. Nested resemblance will always smuggle in the third shape trope, since in the case of *equilaterality* (for example) we cannot say that A and B resemble each other *more* than either resembles C; instead, they simply resemble each other *differently*. But the conditions for constructing resemblance classes do not allow for specifying respects of resemblance, lest we make illicit use of universals by employing the concept of that which A and C "have in common" in virtue of which they resemble each other.

I now hope to forestall a tempting reply to TIC. It might be alleged that, despite their popularity in the examples of trope theorists, tropes like Pink and A are not the *real* tropes after all. Maybe TIC can only be generated if we think that tropes are obvious things like instances of determinate colors and shapes that can be directly experienced. These "manifest" tropes might, after all, be complex constructions of fundamental tropes. And when we discover what these tropes are, TIC might not apply to them.

Such a view might be made to work, but I do not see how. Though I have employed the two most common examples of tropes discussed by trope theorists, I cannot of course construct imperfect communities for types of tropes that have never been described. For now, I can only suppose that this hypothetical trope theorist would want to break the shape trope we called "A" into the different respects in which it has been shown to resemble C and B. The resulting view would be that there is no single determinate shape trope for the equilateral triangle, but instead there is a triangularity, an equilaterality, and many more such tropes, since we found that A could resemble other shape tropes in many different ways. (One problem for such a view is that a square figure, for example, could resemble other figures in being square, in being a parallelogram, in being a rectangle, in being a quadrilateral, etc. But if there is a trope for squareness, it would seem superfluous to have tropes for rectangularity and quadrilaterality as well. Perhaps—and this would help avoid TCP as well—there are determinable tropes at every level of generality. As odd as this view may sound, I consider it in § IX below, where I advance some general objections to the postulation of determinable tropes.[23]) For now it is enough to point out that, on the present proposal, A's triangularity would *exactly* resemble C's triangularity. And so, as far as I can tell, it does not avoid the general conclu-

sion I am about to draw that loose resemblance must be forfeited. After trying to motivate this diagnosis, I will consider two possible versions of TRN that employ only exact resemblance, showing how they avoid TIC and TCP but fall prey to other objections.

VII. Diagnosis

My contention is that standard TRN would give rise to both TCP and TIC, no matter what kind of trope, however un-manifest and fundamental, figures in the theory. This is because the culprit is *loose resemblance*, with which standard TRN builds many of its property classes. TCP arises because, for any determinable property F such that G is a more determinate property falling under it, F is identified with a resemblance class of tropes formed by a loose degree of resemblance, and G with a subclass formed by stricter resemblance. But in a world where the only F tropes are G tropes, the two different degrees of resemblance no longer produce different classes. As for TIC, whenever a single trope stands in many resemblance classes governed by loose resemblance (in order to account for a variety of more determinable properties), it follows that this trope will resemble the other members of these classes in different "respects." And this is precisely what gives rise to imperfect communities. Thus it can be seen schematically that, no matter what kind of tropes one believes in, the difficulties can only be avoided by giving up loose resemblance.

(If this is right, it must be that a paradigm-based version of TRN would fare no better against TCP and TIC. And this is the case. For whatever red tropes in our restricted world serve as the paradigms for redness, those or other red tropes must serve as the paradigms for coloredness; but only one class of tropes can be formed by resemblance with either group of paradigms. Nor will paradigms help against TIC. Either Pink or Purple might be the paradigm for reddishness, but it cannot be sufficient for membership in the class of reddish tropes that the one resembles the other, for Baby-blue resembles each one to just the same degree.)

As I see it, the trope-class nominalist is faced with a dilemma: either appeal to one of the solutions that also work for ORN, or modify TRN by repudiating property classes formed by loose resemblance. Grasping the first horn of the dilemma would certainly solve TCP and TIC: the solutions from §III are solutions for trope-class nominalism just as they are for object-class nominalism, and for the same reasons. So a trope theorist could adopt modal realism to avoid TCP, and/or appeal to the unanalyzability of "naturalness" or "resembles-in-a-particular-respect" to avoid TIC. Making use of any of these replies, however, leaves the trope theorist paying the prices involved and unable to claim the advantage over object-class nominalism that we saw touted in §IV.

The other option is to modify TRN by proposing that property classes are formed by a single resemblance relation, the "exact similarity" relation. Of course, without loose resemblance, the central question becomes: what is to

be said about determinable properties (and other less-than-perfectly-natural properties)? How can we account for the relative naturalness of the class of all red tropes or the class of all triangular tropes? The two kinds of views considered below have different answers. On the "sparse" version of TRN, a determinable property like *redness* is not *identified* with any resemblance class, but it is replaced by a disjunction of exact-resemblance classes of determinate tropes. In contrast, the "abundant" version of TRN posits the existence of determinable tropes that stand in exact-resemblance classes for determinable properties at every level of generality.

VIII. Sparse Trope-Resemblance Nominalism

It should be clear that TCP concerns the relationship between determinables and their determinates. It shows that trope-class nominalists must take determinable properties as identical with their determinates, under some circumstances. The original version of CP, in contrast, compelled object-class nominalism to identify distinct determinate properties. Thus it would seem that trope theorists can respond to TCP in a way that object-class nominalists cannot respond to CP; they can repeal the claim that properties like coloredness and redness are property classes, and attempt to explain statements ostensibly involving them as involving instead only the most determinate properties or disjunctions of determinate properties.[24]

Consider the exact-resemblance classes of red tropes R_1 through R_n (including R_{76}, the class of all mandan red tropes, and R_{54}, the class of all blood red tropes). According to sparse TRN, these exact-resemblance classes form a great disjunction, each disjunct of which is a way of being red. If x is a member of R_{76} and y is a member of R_{54}, they can be said to share a determinable property because each one is a member of an exact-resemblance class in the great redness disjunction. Since sparse TRN denies that "redness" and "coloredness" name resemblance classes, it is never forced to admit that either is *identical* with mandan redness.[25] Neither is there a need in the TIC example to form a resemblance class that we equate with *being triangular*.

There is a glaring deficiency in such a view, however. Simply put, the problem is that the classes $R_1 \ldots R_n$ are supposed to ground reference to a determinable property, but this is not true of just any collection of exact-resemblance classes. So what makes one disjunction of exact-resemblance classes special and another not? We have on our hands again the Problem of Naturalness for determinable properties. For the sentence "redness is a natural property" cannot simply be made true by the classes $R_1 \ldots R_n$, unless an account can be given of what they have in common that a random collection of exact-resemblance classes does not. Put differently, suppose "Q" names the second-order class of all the redness disjuncts, R_1 through R_n. Classes like Q are such that their members form a disjunction each disjunct of which is a way of having some determinable property. But there are second-order classes whose members are

arbitrarily selected exact-resemblance classes. (Call one such second-order class "Z".) Now, any two tropes, each of which is a member of a member of Q, share a property. But this is not so for Z. How, then, can sparse TRN account for what ties together the members of Q?

The sparse trope theorist might say that what $R_1 \ldots R_n$ have in common is that the English attribution "red" applies to all and only things that are members of those classes. But this is unsatisfactory for the same reason that an object-class nominalist cannot simply say, "What makes the class of red things a natural property class is that the English attribution 'is red' applies to all and only them." For this analysis does not account for the difference between classes formed by predicates like "red" and those formed by predicates like "red-or-reptilian." (Not to mention the problem that not all properties have a corresponding predicate.) Likewise, we could invent a predicate "Zish" that applies to all and only members of members of the second-order class Z, and yet shared satisfaction of this predicate would not be sufficient for property-sharing.

For a genuine resemblance nominalist, property-sharing should have to do with *resemblance*. So the proponent of sparse TRN might try to say that what ties $R_1 \ldots R_n$ together is loose resemblance among their members; so if R_{23} is to resemble R_{62}, it must be in virtue of the fact that R_{23}'s members resemble R_{62}'s members. But this approach gives rise to TIC again. To see why, consider the restricted worlds example with only three shapes. The two triangles can be said to share a property because of the resemblance between the single-membered exact-resemblance classes {A} and {C}. But if these classes resemble each other, it can only be because A and C resemble each other. And there is no degree of resemblance that these two bear to each other that each one does not also bear to B. So the class {B} will slip in every time we try to establish some resemblance relation in virtue of which the classes {A} and {C} can be considered ways of being triangular.

IX. Abundant Trope-Resemblance Nominalism

Another way a trope theorist could try to avoid the difficulties with standard TRN is to postulate the existence of tropes at every level of generality.[26] Thus, wherever a mandan redness is found, there is a particular redness and a particular coloredness too. (Wolterstorff once claimed that there are aspects of aspects, and he gave as an example "the hue of the color of the Taj Mahal" (208).) On this kind of view, many different color tropes are found in a mandan red triangle: a mandan redness, a crimsonness, a redness, a coloredness, etc. And each trope is a member of only one property class—an exact-resemblance class. (A coloredness, considered apart from the other tropes found with it, resembles any other coloredness exactly. There is nothing intrinsic to the trope that would differentiate it from the others.) Because abundant TRN avoids the use of loose resemblance to form determinable property classes, it

overcomes both TCP and TIC. The first is avoided as long as there are tropes at every level of generality, because determinate and determinable properties are never equated with the same class in any possible world. The second is avoided because the determinate trope Purple is accompanied by a whole slew of general color-tropes including bluishness tropes, reddishness tropes, and deepness tropes. Some of these, such as the more general bluishness tropes and coloredness itself, have exactly resembling counterparts among the tropes that accompany Baby-blue. These exact-resemblance classes can account for all the properties shared by the three colors, and imperfect communities do not arise.

Various worries accompany abundant TRN. The first is, of course, the explosion of the trope ontology: now there are as many tropes in the realm of color or shape as you can think of levels of generality with respect to those attributes. Thus the compelling tidiness of trope theory as it has been presented to us by Stout, Williams, and Campbell is lost.[27] No longer can *this particular color* stand alone, grounding all attributions of color qualities to the object in question. Instead, every aspect of every object (its color, for instance) involves an indefinite, and perhaps infinite, number of tropes. Though English does not have words for all the levels of generality between coloredness and mandan redness, there are certainly a good number of them. And ordinary language, which had been an ally of trope theory, now becomes an enemy. Whereas the phrase "the shape of that object" used to refer to something determinate, it could now be referring to the object's shapedness, its quadrilaterality, its squareness, or any of an indefinite number of other tropes.

Further, it is hard to see right from the start how a coloredness or bluishness can be at the same time particular but also general. The coloredness of an object must be a distinct trope from the precise color of that object, and yet it must not be a universal; it is something unique to this object. As one tries to understand this amorphous coloredness trope that is particular and yet general at the same time, it seems dangerously close to being an instance of the single universal *being colored*. The boundary with realism about universals has been blurred.

Next, what about the persistence conditions of general tropes (supposing we prefer to think that tropes persist)? Consider the particular shapedness of a triangle as distinct from its particular triangularity: does the shapedness survive if I mold the triangle into a circle? It ought to, since on the view we are considering, its shapedness is exactly similar to the shapedness of a given circle. And intuitively something's being shaped does not depend on its triangularity. But this is another way in which we begin to lose our grasp on the particularity of this object's shapedness: how is it still the particular shapedness that belonged to the triangle?

A final objection to abundant TRN concerns causation. In a one-category ontology, of course, as Campbell says, "the terms of the causal relation are always tropes" (22).[28] It is the razor-sharpness of this knife that caused you

pain when it cut you, and the mandan redness of that cape that incensed the bull. But what about the more general tropes of abundant tropes theory, the knife's sharpness and edgedness, the cape's crimsonness and coloredness? Are these involved in causal activity? It would seem strange to allow that the knife's edgedness is somehow partly responsible for the knife's causing you pain, because the razor-sharpness seems quite sufficient all by itself. After all, the knife's edgedness survives the knife's becoming rather dull. Perhaps the trope theorist could argue that in some circumstances only determinable tropes are involved in causal activity, though I find this position an unlikely one.[29] Instead, it is most plausible to think that only determinate tropes are necessary to explain causal relations. (This, indeed, is the position of past trope theorists, since they have only countenanced fully determinate tropes in their ontology.) But then the vast majority of tropes are causally impotent, coming and going because they are somehow entailed by determinate tropes, yet without any effect on the world.

X. Remarks on "Painless Realism"

While D.C. Williams's last comments on TRN laud it as "demonstrably adequate," they also indicate that he himself had given it up "on the presently unfashionable ground that the set of [humanity] tropes is not what I or any of the rest of us mean by 'the universal character Humanness'" (1986, 7). Instead, Williams proposes that we consider degrees of resemblance as pseudo-identity conditions:

> The requisite two identities, or notions of identity... a stronger and a weaker, are familiar in the ordinary conversational uses of 'identity', sometimes for the full partitive and individual identity, which is such that a is 'identical' with b if and only if every part of a is a part of b and conversely, and which entails but is not entailed by exact resemblance, and the 'identity' which *is* just exact resemblance. Entities determined and named in the first principle, by definition not subject to the identity of indiscernibles, are cases or particulars; entities determined in the second way, by definition subject to the identity of indiscernibles, are 'general' entities, that is, kinds or universals. In just this way we mean something a little different by 'the entity' when we say 'the entity Harlac' from what we mean by 'the entity Mandan Redness,' though they not merely are together but are distinguished by the same abstraction. (1986, 8)

The distinction between particulars and universals, then, hinges on the criteria used for counting. This is Williams' "painless realism". And although Keith Campbell seems to hold TRN, he reminds us that we could always revert to Williams' new trope theory if we wish to avoid the results of J.P. Moreland's abstract reference objections (Campbell 74). So despite the fact that, as Michael Loux has recently put it, "virtually all contemporary trope theorists" contend that "abstract singular terms name *sets of resembling tropes*" (83), at least two

of trope theory's main proponents have not put all of their eggs in the basket of standard TRN.

Williams' new version of trope theory, however, is far from painless. First, if the game is to take our cue from the meaning of every-day language, calling exact resemblance "loose identity" does not seem to help much. Nor does it shed any light on the relationship between all mandan red tropes. Most importantly, however, "painless realism" still falls prey to TCP and TIC. Determinate attributes are not now considered exact-resemblance classes, but real entities of some sort which reappear when we count according to "loose identity": "we are now constrained to say 'This is Mandan Redness *too*,' the whole entity all over again" (Williams 1986, 8). As for more general attributes, presumably we are to have even *looser* forms of identity by which we can count a single attribute like *coloredness* when we see a range of determinate color tropes. If we are looking at all the red tropes in the world, *mandan redness* is the entity that appears, say, a thousand times and is counted once, while *redness* is the entity that appears billions of times and is counted once.

This looser identity should remind us of the old loose resemblance. Thus if all the color tropes in the world were a million mandan rednesses, *mandan redness* would be the entity (loosely counted) that appears a million times and is only counted once; but *redness* and *coloredness* (though more loosely counted) would also appear a million times each and only be counted once. In such a situation, the different criteria for counting these properties would fail to distinguish them; this is TCP all over again. In addition, however loose or tight our criterion for counting is, at a world with shapes restricted to the tropes A, B, and C, the attribute "triangularity" either has three instances or none. There is no degree of loose resemblance (or "looser identity") that will allow us to count only the two genuine instances of triangularity among the three tropes. And so we have an imperfect community.

XI. Conclusion

The standard version of TRN encounters companionship and imperfect community difficulties, as does "painless realism". Moreover, two versions of trope theory with only exact-resemblance classes—sparse and abundant TRN—are subject to other fatal objections. So, unless a workable modification of TRN is found, trope theory has no advantage over ORN when it comes to constructing a resemblance-class theory of properties. And because such an advantage has so far been considered one of trope theory's most compelling features, this result significantly de-motivates trope theory. As for resemblance-class nominalism in general, the outlook is bleak. Tropes or no tropes, only the solutions discussed in § III provide the resources for a successful theory of property classes. But this means adopting modal realism as well as forming natural classes without ordinary resemblance and its explanatory power.[30]

Notes

[1] "Nominalism", as I will use it, refers to the doctrine that there are no universals.

[2] This is a simplification, since a satisfactory class-nominalist analysis of "redness is a color" would probably be strengthened modally. But my purpose here is not to examine the degree to which extant versions of class nominalism succeed in overcoming the "abstract reference" problem: see Frank Jackson's "Statements About Universals" for a discussion, and also Lewis 16–19.

[3] If an analysis of predication is a mandatory task for a theory of properties, I think class-nominalism has little chance of success. It is for this reason that certain philosophers with particularly stringent criteria for a theory of properties are dissatisfied with the very idea that a property could be replaced by a class, whether or not technical problems accompany class-nominalism. After all, the only candidate for an object-class analysis of what it is to be F, for a given predicate, is the thesis that things are F in virtue of being members of a certain class of objects. But, the complaint goes, membership in this class has nothing to do with an object's being red—after all, the very same objects could all be blue. Or if membership is expressly limited to red things, the account is backwards, for a thing is one of the red things in virtue of its being red, and not vice versa (see Armstrong 1989 27–28, 49; 1978 50–51; and Van Cleve 579). Adding the stipulation (elaborated below) that members of property classes must have some degree of *mutual resemblance* does not help: far from being red because they resemble, two red things resemble (at least in part) because they are red. (Note that this point applies equally to standard trope-class nominalism, which can offer no other *analysis* of the fact that a trope is red, other than that it is a member of the resemblance class of red tropes.) Perhaps there is a response to this kind of worry that accepts the objector's terms. But as far as I can tell, class nominalism does not have the resources for a successful analysis of predication. Thus a class-nominalist should reject the assumption that "a is F" cannot be taken as primitive.

[4] Neither will those who do not require an analysis of predication be intimidated by instances of multiple predication: if "a is F" is perfectly all right as it is, then so is "a and b are F" (which is just another way of saying "a is F and b is F"). There is nothing to two things' both being red over and above the fact that each one, individually, is red. However, no such deflationary account can be given of property-sharing *in general*; even if she is right that predication cannot be analyzed, our class nominalist must still provide an account of sentences that quantify over properties, like "a and b share some property". And this is where property classes come in.

[5] For David Lewis's formulation of the One over Many problem, see Lewis, 20–25; for that of Armstrong, see Armstrong 1978, 12.

[6] On the naturalness of classes, see Armstrong 1978, 38–41; Lewis 12–16; Quinton 33–58.

[7] For Carnap's "similarity circles" see Carnap 129. Though Carnap was specifically concerned with classes of *erlebs*, his system has been adapted to suit object-class nominalism. The conditions in this paper are based on Wolterstorff 207. See also Goodman 129 for similar conditions based on the *Aufbau*.

[8] At least, so the story goes. As far as I know, all past discussions of ORN assume that in the actual world the class of red things can be formed by mere resemblance among red objects. For brevity's sake, I will not dispute the point here. However, John Hawthorne recently convinced me in conversation that, at best, one cannot prove from the armchair that this is the case. The argument is a bit complex, though, and ORN is adequately undermined by the difficulties I discuss below.

[9] Goodman: "companionship," 122–123,136–137, 168–169; "imperfect community," 112, 124–125.

[10] For an IC example like this one, see Quine 120–121.

[11] Quine once suggested (and then rejected) another way to construct resemblance classes, making use of both paradigms and foils (119–120). However, the possibility of restricted worlds itself is enough to cause difficulties for such a view: if a redness class is defined by resemblance to some paradigmatically red objects, and non-resemblance to some non-red foils, then the world

with only red things in it (oddly) fails to have a resemblance class of red things. But, as I have stressed, any successful theory of properties must be adequate to all possible cases of property-sharing.

[12] Three such predicates are offered by Alan Hausman, David Lewis, and Gonzalo Rodriguez-Pereyra. The first two are polyadic, and apply to all the particulars that have some property in common. Lewis's is also contrastive and *variably* polyadic, while Hausman's has *n* places, where *n* is the number of particulars in the greatest possible property class. Rodriguez-Pereyra has shown that a polyadic predicate is not required to avoid IC: a dyadic predicate will do, as long as it can apply between pairs (973–978). At the base level, his predicate applies to pairs only when each member of each pair shares a property. At the next level, the predicate applies to pairs of pairs only when it applies among all four base pairs. And so on.

[13] Lewis (14–15) discusses the "daunting price in complexity and artificiality" that accompany such predicates. As Lewis admits, "We cannot get by with the familiar dyadic 'resembles'." That the satisfaction of the polyadic predicate cannot be reduced to the dyadic resemblance between particular members suggests that it deviates significantly from our intuitive concept of resemblance. But if the predicate is to be understood as an *extension* of our concept of resemblance, is it a *legitimate* extension?

Perhaps the predicate can be understood (extra-systematically) as "... all resemble-in-a-particular-respect." Goodman himself realized that a polyadic predicate could form the right classes, but he thought this would be circular: "Nor can we correct the trouble by amending the definiens to read 'class of things similar to each other in some one respect throughout'. ... Similarity is, of course, similarity in *some respect or other*. ... When, however, we say that more than two things are all similar *in one respect* we are in effect saying not only that each two are similar but also that some 'respect' in which any two are similar is the same as that in which any other two are similar" (113). That is, resemblance is between things that share any property—not a particular one. As soon as we must specify the property that is shared, we have smuggled a concept into an explanation that is supposed to be prior to that concept. It also seems to get backwards what resemblance nominalists should believe: that things share properties in virtue of their resemblance, and not vice versa. For to understand this special kind of resemblance, I need to think of things resembling in virtue of some single property they all share.

The worry is this: either we are to understand the predicate in terms of resemblance, or not. If so, we must illicitly employ the notion of the respect itself that is had in common by all members of the class, and the result is conceptual circularity. If not, the new predicate provides no progress in explaining what it is in virtue of which things share membership in a natural class.

Rodriguez-Pereyra has another reason for rejecting polyadic "resemblance" predicates: "Consider the basic fact about resemblance, that, if the members of a certain class resemble, then so do the members of any subclass of it. ... But if resemblance is collective then the fact that a, b and c resemble is entirely independent of the resemblance facts of any two of them. ... The 'collectivist' about resemblance cannot then explain why if a certain number of particulars resemble, then so do any two of them" (973). Rodriguez-Pereyra's own predicate, discussed in the previous footnote, is dyadic. Call it S*. It applies to pairs the members of which all share a particular property (and to pairs of such pairs, and so on), so it does not suffer from this difficulty. But it does not avoid the dilemma I raise against the new "resemblance" predicates.

Like solution (3), Rodriguez-Pereyra's solution leaves us with a predicate that applies to *classes*. And the predicate cannot be analyzed simply in terms of ordinary resemblance among the *members* of those classes. Think of the three things in the restricted world of our IC example: *ry*, *sy*, *sr*. Now, S* succeeds in disallowing {*yr*, *ys*, *sr*} as a property class because the pair {*yr*, *ys*} and {*sr*, *ys*} does not satisfy it. But each of the members of one pair resembles each of the members of the other pair. Resemblance based on the *members* of the pairs does not allow us to reject {*yr*, *ys*, *sr*}, and so the "resemblance of pairs" according to resemblance applied to the individuals in the pairs gives us a different result than does S*.

Rodriguez-Pereyra tells us that S* is to be taken as primitive. Extra-systematically, we can understand this predicate as applying to two base-level pairs when all four members share a property (or resemble-in-a-particular-respect). But this leads back to the dilemma: either the predicate is supposed to help explain, by means of our concept of resemblance, what it is in virtue of which a class is natural (in which case the explanation is conceptually circular); or else it is hard to see why it should be preferable to the primitive predicate "natural." After all, our extra-systematic understanding of S* is very much like this: S* applies to two base-level pairs as long as the union of those pairs is a natural class (or a subclass of one).

[14] A similar point is made by Lewis (Lewis 15, fn 9).

[15] See footnote 13.

[16] Some expositions of the difficulties, of course, do not mention trope theory at all. Of those who do mention trope theory, Moreland alone (as far as I know) has advanced versions of both the companionship and imperfect community problems against a particular type of trope theory (1985, 115–120), (1989, 388–392) and (1997, 230–232). His formulation of the difficulties, however, is targeted exclusively at a view of tropes (one that Campbell once held) according to which a trope and its location are identical. In fact, each of Moreland's arguments requires as a premise the identity of every trope with its location (1985, 117–119). Campbell has rescinded this view (Campbell 66), and nobody else has held it (as far as I know), so Moreland's versions of the companionship and imperfect community problems are no longer damaging to trope theory. Neither of them stands against trope theories that do not consider tropes identical to their location or to coextensive tropes.

[17] Wolterstorff prefers to construct his resemblance classes out of objects *and* tropes, so that we get {*y*, *sy*, *sy*...} and {*s*, *sy*, *sy*...} (208). Like ordinary TRN, this way of constructing resemblance classes solves the standard versions of IC and CP but falls prey to my revised versions of those difficulties. Since it does not differ relevantly from the standard method of constructing resemblance classes out of tropes (that of Williams and Campbell), I will assume for the sake of simplicity that trope theorists have a one-category ontology.

[18] See also Campbell 31. Each trope gains membership in various "natural kinds," as Campbell calls them, some of which are broader and some narrower depending on the stringency of the resemblance relation that governs the kind. Using the example of musical pitch, Campbell writes: "From the narrow determinate kind of exactly resembling pitch tropes proceeds a more and more encompassing nest of natural kinds up to the (last) determinable, pitch *per se*" (83).

[19] Moreland (1985, 99) briefly considers restricted worlds of this sort to help advance an argument that "the Nominalist account denies that ['red is a color'] is an example of essential predication." He argues forcefully that the trope theorist encounters difficulties when trying to parse "red is a color" as a necessary truth. For the current set of colored things may be destroyed (by losing, say, a green member) and the rest of its members would remain because "sets are not the essence of their members" (99). The fact that each particular redness does not seem to depend in any way on the broad class of colored tropes, suggests that trope-class nominalism undermines the intuition that red is necessarily a color. At least, it cannot parse "red is necessarily a color" as "every red trope is essentially a member of C," where C is the set of all colored tropes. The thrust of Moreland's argument on pgs. 98–101 is to show that the trope-class nominalist's interpretation of "red is a color" is not "a paraphrase of a Realist account," but is instead "a replacement" (98).

[20] Further, as was pointed out to me by Alexander Pruss, we must be able to make sense of the fact that some red person in that world could truly say, "*Redness* and *coloredness* need not be co-extensive properties". But if the two words in italics refer to the same class, this sentence (on the face of it) is false.

[21] Thanks to an anonymous referee for this idea.

[22] Notice that we are considering not the resemblances between the 2-d objects, but the resemblances between their shape tropes. If there is anything in principle wrong with this, it counts against theories of resemblance classes of tropes, not against this objection.

[23] If we allow for determinable tropes it is hard to see why they should not be allowed at every level of determination, which is what the view considered in §IX allows. (This also provides an answer to TCP.) For instance, B would have to be composed of a rectangularity, an equilaterality, a convexity, etc. But would not the rectangularity itself need to be made up of a parallelogram-trope and an equiangularity, since the determinate shape can also resemble in these respects?

[24] For suggesting something like this, I am again indebted to an anonymous referee for *Noûs*.

[25] A problem very like TCP still applies, however. This is because, in a world where all red things are mandan red, mandan redness is the class $\{R_{76}\}$ and saying "x is red" means that x is a member of a member of $\{R_{76}\}$. But doesn't this amount to the same thing? Someone might reply that the difference lies in the fact that there are two types of predication on this view: even in a restricted world, determinable predications, since they are higher-order in nature, are open to different ways of being satisfied. But both "is red" and "is colored" are higher-order: "is colored" can be predicated of anything that is a member of a member of the following class: $\{R_1, R_2, R_3..., Y_1, Y_2, Y_3..., B_1, B_2, B_3...\}$. The result is that "is red" and "is colored" will say the same thing in the same way in some possible worlds.

[26] I am indebted to a number of Donald Smith's suggestions regarding abundant TRN.

[27] Although Campbell thinks the standard "manifest" trope theory avoids CP and IC, he does provide other reasons for rejecting it (Chapter 6). At the beginning of *Abstract Particulars*, he uses standard examples of manifest tropes to advance the plausibility of trope theory, but by the end of the book he suggests that there are in reality only a few real tropes (fields), none of which are directly perceptible.

[28] Williams uses these examples: "the actual strength of a girder is what holds the bridge up; the heat of an atomic explosion scorches a city..." (1953, 184).

[29] An anonymous *Noûs* referee proposed that it is precisely the *coloredness* of a color photo that causes one to notice it amid a collection of black-and-whites. It seems to me, however, that in such a case it is the determinate colors that catch one's eye, though one may not take precise stock of which colors they are. I grant that if we have reason to think that determinable tropes do influence things causally (even if only occasionally), my last objection to the abundant theory loses force.

[30] That is, if both difficulties are to be overcome, class nominalism must employ solutions 1 and 2 or 1 and 3 from III. Thanks to Dean Zimmerman, Michael Loux, Gonzalo Rodriguez-Pereyra, Donald Smith, Joe Syverson, Alexander Pruss, and Angela McKay for helpful discussions about the central arguments of this paper and (in some cases) comments on earlier drafts. I am also indebted throughout to two very helpful anonymous referees for *Noûs*.

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