**Nominalism and the Practice of Science**

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I will argue that on trope or austere nominalism, the qualities of the world collapse either into universals, or bare particulars. If the individuator can be eliminated, we seem to be left with an abstract entity. Or, the quality can be eliminated, leaving us with a bare particular. The former option results in the annihilation of nominalism; the latter, however, seems to leave the real world without qualities that we can investigate and know, including by science.

This result might seem premature, however, and so I will consider David Lewis’s famous rebuttal of anti-nominalist arguments, that not every account needs to be an analysis. I will argue that this basic appeal is mistaken in light of my other findings. Thus, the results should apply in full measure to scientific practice. There are several possible results, but all of them undermine scientific investigation and knowledge. Indeed, I will argue (in part) that we would be like philosophical zombies, who lack any conscious abilities to empirically observe the world, much less gain knowledge thereof. But, even if we had such qualities, the world we study by science would not.

Yet, we do have many cases of scientific knowledge. That suggests that nominalism is false, and thus it should be rejected for science.

**From Nominalism to Bare Particulars, or Universals**

***Trope Nominalism***

According to trope theory, there are particularized properties. As particulars, they are non-shareable and non-repeatable. I will focus on tropes as minimally- or singly-propertied-objects, which have their own natural character.[[1]](#footnote-1) Moreover, tropes themselves are objects and are fundamental; macro objects, such as balls, humans, and apples, are bundles of compresent tropes.

Generally, tropes are said to be simples. Examples could include particular, individualized qualities, such as red1, red2, red3, or taste1, taste2, taste3, etc. According to Anna-Sofia Maurin, tropes are primitively simple[[2]](#footnote-2), but also particular individuals and abstract. She explains that by being simple, this does not mean “the same as ‘having no spatial parts’,” or as having no properties.[[3]](#footnote-3) Rather, she leaves open the possibility that a trope could have properties (i.e., second-order tropes) and still be simple.[[4]](#footnote-4)

Furthermore, according to Maurin, tropes can be understood as *not* containing “more than one kind of entity.”[[5]](#footnote-5) That is, there cannot be “separate grounds ‘in’ the trope” for its particularity and abstractness.[[6]](#footnote-6) Accordingly, the way in which a trope is particular (and abstract) “*cannot* be due to the existence of some separate particularising and/or qualitative element *in* the trope.”[[7]](#footnote-7) For a trope itself is not a union of two entities, an individuator and some quality that is thereby individuated. As Maurin explains, “We cannot say of the trope that it is particular as a result of *x* and that it is abstract as a result of *y*.”[[8]](#footnote-8) If that were not the case, tropes would seem to be like universals when they are instanced in some bearer, as realists maintain. For example, a universal is predicated of a particular, which forms the nature of the quality-instance.

Keith Campbell’s early theory seems to fit these general descriptions. On his early view, a trope is an *abstract particular*, which is a member of a set whose members stand in a relation of exact similarity.[[9]](#footnote-9) Furthermore, a trope is simple without any further parts or properties. As a particular, a trope is completely exhausted in its one embodiment, such as the numerically singular shape of my hat.

Generally speaking, tropes also are fundamental in that they can exist on their own, apart from being compresent with other tropes in a macro object. Again, Campbell follows this pattern; tropes are independent entities, yet a trope can be a part of a whole in which it is found bundled together with other compresent tropes, as in the case of macro objects such as hats, balls, apples, persons, and so on.[[10]](#footnote-10)

Since a trope is simple, how then did Campbell account on his early view for apparently two aspects of a trope, its qualitative nature and its location? Consider his view of a trope as abstract. Clearly, it is not abstract metaphysically; if it were, it would be shareable, like universals. Instead, for him, tropes are epistemically abstract, since his distinction between these aspects seems to be that of reason.[[11]](#footnote-11) We seem to make such distinctions by our “concentrating attention on some, but not all, of what is presented.”[[12]](#footnote-12) Since it is not metaphysically abstract, wherever a trope is located, it must be in a formed volume (i.e., a specific, spatial location).[[13]](#footnote-13) Thus, a trope is taken to be an individual-quality-at-a-specific-place.

On his modified, later view, a trope still is simple and abstract.[[14]](#footnote-14) Yet, he has shifted from location to particularity in individuating a trope. A trope is a particularized nature that, as a brute fact, sustains two roles: (1) it stands in a relation of exact similarity of nature to others in its similarity set; and (2) it is particular and individuated from all others in that set.[[15]](#footnote-15) Yet, he still seems to affirm that the difference between the nature and particularity of a trope is a distinction of reason. If he were to affirm it to be ontological, in effect he would change a trope into a complex entity.[[16]](#footnote-16)

Just because tropes are simple ontologically, it does not follow that they cannot sustain many roles. So, for instance, a trope can be thought of as an object, a property, or a power. More pertinently here, it also can be thought of in terms of its role as standing in a relation of exact similarity to other tropes in a given similarity set.

Since tropes do not contain more than one kind of entity, how might we conceive of a thought, *t1,* in a way that fits within trope ontology? The answer seems apparent; *t* is a bundle of compresent tropes, such as the intentionality “of” *t1,* the contents of *t1* (which itself might be composed of various tropes; e.g., the concept and its component tropes), and so forth.

So, now let us apply Campbell’s earlier and later views of tropes to this case. On his earlier view, a trope is an individual-quality-at-a-specific-place. Since a thought is a bundle of compresent tropes all at the same location, and for each trope, its location differs from its quality by just a distinction of reason, we could eliminate all these bundled tropes’ location, which would leave them as just qualities. But, then they no longer seem to be individuated, or spatially and temporally located. That is, they seem to be like Platonic realists’ metaphysically abstract entities.

There is a further problem for Campbell’s early view. J.P. Moreland identifies the problem by means of this puzzle:

Consider a concrete particular, say, an apple. The taste trope and the colour trope of the apple, indeed all the apple’s tropes, are at the same place since the apple is merely a bundle of compresent tropes. Now the nature of the taste trope differs from its location/formed volume by a distinction of reason only. Likewise, with the colour trope and all the others. But then, the taste of the apple is identical to its place as are all the other tropes in the bundle. Now by the transitivity of identity, all the tropes of the apple are identical to each other and, indeed, the apple is reduced to a bare location. Concrete and abstract particulars turn out to be bare simples and this is incoherent.[[17]](#footnote-17)

In the same way, *t1*’*s* qualities (such as its intentionality and its conceptual content) can be eliminated without ontological loss, and *t1* itself seems to reduce to just a bare location.

Now, Campbell has admitted that this puzzle, and others, too, is decisive against his earlier view.[[18]](#footnote-18) What then about the prospects for his later view, on which a trope is a particularized quality, or nature? Here again, since a trope is simple, it is not two entities joined in some way. Therefore, the same kinds of problems resurface for Campbell’s later view. Applied to thought, the quality of intentionality of *t1* can be eliminated, as can its intentional content, with its concepts. *T1* becomes a bare individuator, without qualitative facts.

Generalizing, on trope theory, the implications for our knowledge of the qualitative aspects of reality seem evident. Thoughts (and likewise beliefs) would not have any qualitative, intentional contents. Moreover, they would not even have intentionality. However, since intentionality seems necessary for thoughts and beliefs, thoughts and beliefs would not really exist. But, without beliefs that really have intentionality, we will not have propositional knowledge.

Now, the same issues seem to apply to experiences which we use to make observations of the world, as in science. Intentionality seems necessary for them, too. If we pay attention to what is before us in conscious awareness when we make an observation of, for instance, the behaviors of gases in an experiment, we can notice that our experience *e1* is *of* those gases and their behaviors. Moreover, just as the case with *t1*, it seems that *e1* could not be the particular experience it is and have turned out to be about something else. Therefore, just as with thoughts and beliefs, it seems that we will not be able to have experiences used to make observations based on trope theory.

Yet, it also seems that on tropes, there would not be real qualities to objects in the world. Insofar as objects are bundles of tropes, it therefore seems in effect that we could not know them as such either. Moreover, it seems there would not be any “we” to have knowledge, for if we are a bundle of tropes, it seems we too would not have real qualities. It seems that we, too, would reduce to bare individuators, which could not have knowledge.[[19]](#footnote-19)

But, it does seem that we know many features of the world, and trope theorists such as Campbell do not want to deny that. We can know the colors, shapes, sizes, tastes, and textures of many things. We also know many of the nutritional qualities inherent in naturally grown plants and sea life, such as fish. It seems we also can know the qualities of our thoughts and beliefs, assuming we pay attention to them. But, given that we do know these things, then it seems trope theory is mistaken.

Now, Maurin is aware of Moreland’s type of argument (though from a much earlier source). Indeed, she realizes that it cuts against the very *possibility* of trope theory, much as I have argued. But her argument, at least in *If Tropes*, is intended merely to rebut his argument in light of her specific concern there – to explore what would be the case *if tropes’ existence is assumed*.[[20]](#footnote-20) As such, that rebuttal does not affect the validity of Moreland’s argument.

***Austere Nominalism***

But, what about the concrete particulars of austere nominalism (AN)? There are many varieties of AN, and time does not permit an exploration of each one, or of its cousin, metalinguistic nominalism.[[21]](#footnote-21) Nonetheless, they have in common the metaphysical view that concrete particulars are simple. According to Robert Garcia, “Austere nominalists hold that, strictly speaking, there are no properties but only primitively charactered objects; there are spherical objects—billiard balls and the like—but no sphericity (or sphericities) per se.”[[22]](#footnote-22) Like tropes, it seems AN’s objects lack any metaphysical parts or constituents. This has led some to call AN a “blob” ontology since its entities (i.e., concrete particulars) are simples with no internal differentiation of properties, which leaves them as being “relatively structureless.”[[23]](#footnote-23) But, that being the case, it seems the same problem we saw for tropes will apply to AN.

**Lewis’s Rebuttal**

Perhaps, though, my argument could be set aside by nominalists by appealing to David Lewis’s well-known point that “not every *account* is an *analysis*!”[[24]](#footnote-24) For instance, when I argued that a trope’s qualitative content can be eliminated without real loss ontologically, and that it seems there would not be real, qualitative content in objects for us to know, a trope nominalist could argue that I have pressed for an analysis beyond what is required. Following Lewis, the trope nominalist can accept that tropes have these qualities as a primitive fact and still be giving an account of this qualitative fact. As Lewis explained, “an effort at systematic philosophy must indeed give an account of any purported fact,” and a justifiable way to do that is to accept it as primitive.[[25]](#footnote-25) Lewis mentions two other ways: someone could analyze the fact as such and such, or someone could simply deny it. For nominalists, “a system that takes certain Moorean facts as primitive, as unanalysed, cannot be accused of failing to make a place for them. It neither shirks the compulsory question nor answers it by denial. It does give an account.”[[26]](#footnote-26) Trope nominalists might charge that I have sought further analyses when none are required of them.

Let us notice that Lewis gave this argument in the context of discussing D. M. Armstrong’s use of the “one over many” argument for universals. Lewis wrote that Armstrong made a “legitimate demand for an account of Moorean facts of apparent sameness,” but subsequently he demanded “an analysis of predication in general.”[[27]](#footnote-27) But, since an analysis is just one way to give an account, his demand may be set aside by the nominalist.

Now, it simply may be difficult to persuade a trope nominalist to reconsider this deeply-entrenched mindset of appealing to primitive facts and even entertain my argument. Nevertheless, let me make an observation. My argument has focused upon the ontological resources in trope nominalism and AN to sustain qualitative facts, and then I have applied that finding to our abilities to have knowledge of those qualities. I have argued that, taken consistently, trope theory lacks the needed ontology for there to *be* such facts, whether of thoughts and their intentionality, or other objects of knowledge. I *am* suggesting that result serves as an undercutting defeater for trope or AN theorists’ appeal to such facts as primitive. That appeal seems unjustified, for on trope or AN theories’ ontological resources, they do not seem to be able to exist; moreover, we could not know them. While it is relatively easy to make claims and appeal to their being primitive, it is another matter when those claims’ own presupposed ontology undermines them.

Also, my argument does not try to give an *explanation* or *analysis* for how we can have knowledge of reality. Rather, I simply claim what I think realists and nominalists will grant, that we do have knowledge of various (even many) qualitative facts of reality. However, I then explored and argued against the prospects for our being able to have such knowledge if some form of nominalism is true.[[28]](#footnote-28)

**Implications for Scientific Practice**

If accurate, there are several implications of my argument. At one level, it seems that by not being able to support real qualities, there would not be any essences on nominalism. But, without them, as Daniel Dennett has suggested, there would not be any “deeper facts” to any representation we may have (a thought, belief, observation that is about something). Without essences, there would not be any representation that intrinsically is about something; instead, everything would be subject to interpretation. As Dallas Willard explains, Dennett seems to be left with only events of “taking as,” in which we *take* (or interpret) some input *as* something else.[[29]](#footnote-29) But, since it seems there are no essences on nominalism, then it seems that there is in principle no point that would stop the regress. For that matter, nor is there a starting point to begin interpretation. It seems we are left with a thoroughgoing constructivism for any objects to obtain in the world. But, how that construction would take place is a mystery.

At a second level, I have argued that nominalism cannot support the existence of thoughts, beliefs, or experiences we use to make observations. I argued for this position due to the simplicity of the particulars, whether on trope or AN. Since the qualitative aspect of these states can be eliminated, leaving just bare particulars, we lose these states’ intentional contents. But, it does not seem we can have these states without intentionality, for it seems intentionality is a necessary condition for them to obtain. Thus, we lose these states altogether. Yet, without them, we seem to lose any observations of the world, along with any interpretations or beliefs. Moreover, on the standard definition of knowledge as justified true *belief*, we lose propositional knowledge too.

Without experiences we use to make observations, or beliefs, or thoughts, what would scientific investigation and practice be like? At best, it seems scientists would be like those dressed in white lab coats, which go through the physical motions we associate with conducting science, yet are like *philosophical zombies*. Such a zombie would not be a stereotypical, Hollywood brain-or-flesh eater, but a human *without any conscious experiences*.[[30]](#footnote-30)

If this were the case, it seems we could not even associate (or interpret) these scientists’ behaviors as doing science. That ability seems to presuppose that we know *what it is like* to conduct experiments, make observations, interpret them by a hypothesis, evaluate if the data helps confirm it, etc. But, these acts also involve intentionality, as do our experiences of these people, and our thoughts about the scientists’ behaviors.

Second, I do not think it will help preserve intentionality and these states if we treat intentionality naturalistically. There seem to be two main ways that naturalists have proposed.[[31]](#footnote-31) First, there is a reductive strategy suggested by Michael Tye, that intentionality is a causal covariation under optimal conditions. Why is my thought about the object being studied? Because that state in me is caused by the object under reliable conditions.

Now, there is indeed a causal, physical story to be told to sense perception. However, this move will not suffice for an adequate understanding of intentionality. On his view, a long, causal chain of physical states stands between me and the object. The only thing that I can access is the last state; why then should I believe that it somehow matches up with, or is about, the originating object?[[32]](#footnote-32)

The second version is suggested by Daniel Dennett: intentionality just is an attribution we make to enable us to gain efficiency in making predictions. Why did the chess grand master move his queen to that spot in that play of the game? Because he *believed* he could check his opponent in one subsequent move. Did the grand master actually have such a belief? No, says Dennett, for there are no such things on his naturalism; there are only attributions we make from what he calls the *intentional stance*.

Yet, Dennett’s move seems to beg the question at hand. How is it that we can make such attributions? It seems it is because we can have experiences that actually are *of* these opponents and their behaviors. Moreover, it surely seems we know *what it is like* to have experiences, thoughts, and beliefs, which is why we can even begin to form these interpretations, much less with some justification. [[33]](#footnote-33)

Without intentionality, we lose not just propositional knowledge, but also knowledge by acquaintance. Yet, scientists regularly conduct experiments to observe objects and events in the world, and they make many knowledge claims. Nominalism thereby seems to undermine the practice of science.

Considered from a third level, it seems that there would not be any qualities to observe empirically if nominalism were true. Objects of observation (stars, human organs, fly eyes, molecules, etc.) have qualities, it seems. Often these have been stated in terms of primary and secondary qualities. Primary qualities are ones of the material world, such as solidity, shape, size, and motion.[[34]](#footnote-34) Secondary qualities include, for instance, colors, tastes, smells, and sounds.

However, as I argued, due to nominalism’s adherence to the simplicity of its particulars, the qualitative aspects of objects seem eliminable, leaving as objects just bare particulars (i.e., individuators). Now, to exist, it seems bare particulars need to have at least one property; they are not bare in the sense of not having any properties.[[35]](#footnote-35) But, these particulars are bare because they are simples, and they have no internal differentiation within them. Qualities can be merely *tied* to them; qualities do not enter into the being of the bare particular.

Now, this suggests that material, empirically observable qualities, the very kind of the stock and trade of science, would not obtain in the world. This means that qualities like shapes, sizes, motions, degrees of solidity, and much more could not be studied by science. Likewise, the qualities of chemicals, which we take to be part of the real world and a subject of science, would not exist, either. In principle, we would have bare, empirically unobservable particulars, and for all intents and purposes, there would not be a real world to investigate by science.

As a fourth consideration, and as an extension of the previous point, it seems there would not be any observers and interpreters to do science. Science, and any other academic discipline or profession, for that matter, would not exist.

Now, all four of these implications are drastic and should strike us as counterintuitive, being contrary to the fact that we do practice science, and there is a world that we do investigate scientifically. Moreover, we do have many cases of scientific knowledge. Yet, in principle, it seems that nominalism and science are incompatible. That suggests that nominalism is false, and thus it should be rejected, at least for science.

**A Final, Anti-Realist Objection**

Last, some might object that my anti-nominalist arguments have presupposed a scientific realist approach, since I argue much about the nature of the world that we experience. Therefore, they would not affect anti-realists’ nominalism. Now, anti-realists deny that our scientific theories give us knowledge of the world as it truly is and how it operates. Nevertheless, anti-realists do not reject the reality of an external world; rather, they presuppose it. But, I am calling into question that very bedrock presupposition of realists and anti-realists alike. Thus, I think the objection fails, and I conclude that nominalism seems to undermine the practice of science, including scientific knowledge.

1. Robert K. Garcia, “Two Ways to Particularize a Property,” *Journal of the American Philosophical Association* 1:4 (2015): 638. Garcia distinguishes module tropes, which is my focus, from modifier tropes. But I think modifier tropes will face similar problems. [↑](#footnote-ref-1)
2. Anna-Sofia Maurin, *If Tropes* (Dordecht: Kluwer Academic, 2002), 14, 16. [↑](#footnote-ref-2)
3. Ibid., 14-15. [↑](#footnote-ref-3)
4. Ibid., 15. [↑](#footnote-ref-4)
5. Ibid. [↑](#footnote-ref-5)
6. Ibid. [↑](#footnote-ref-6)
7. Ibid., 16. [↑](#footnote-ref-7)
8. Ibid. [↑](#footnote-ref-8)
9. Keith Campbell, “The Metaphysic of Abstract Particulars,” *Properties*, ed. by D.H. Mellor and Alex Oliver (New York: Oxford University Press, 1997), 135. Reprinted from *Midwest Studies in Philosophy VI: The Foundations of Analytic Philosophy*, ed. P. French, et al. (Minneapolis: University of Minnesota Press, 1981), 477-88. [↑](#footnote-ref-9)
10. Ibid., 128, 132. [↑](#footnote-ref-10)
11. Thus, his understanding of abstractness of a trope stands in contrast to that of Maurin. For her, a trope’s abstractness is best understood simply as its inherent qualitativeness. Indeed, she observes that the term “abstract” suggests a number of misunderstandings, including that it means the mental, or “the product of some magical feat of the mind.” See D. C. Williams, “On the Elements of Being: I,” *The Review of Metaphysics* 7:1 (Sept. 1953), 14, in Maurin, 21. [↑](#footnote-ref-11)
12. Campbell, “The Metaphysic of Abstract Particulars,” 126. See also J.P. Moreland, *Universals*, in *Central Problems in Philosophy* series, ed. John Shand (Montreal: McGill-Queen’s University Press, 2001), 53. [↑](#footnote-ref-12)
13. Campbell, “The Metaphysic of Abstract Particulars,” 135-36. [↑](#footnote-ref-13)
14. Keith Campbell, *Abstract Particulars* (Oxford: Basil Blackwell, 1990), 69. [↑](#footnote-ref-14)
15. Ibid., 68-71; see also Moreland, 60. [↑](#footnote-ref-15)
16. Campbell, *Abstract Particulars*, 56-58, 89-90. See also Moreland, 60. [↑](#footnote-ref-16)
17. Moreland, 58. [↑](#footnote-ref-17)
18. Moreland, 58; see also Campbell, *Abstract Particulars*, 65-66. [↑](#footnote-ref-18)
19. Even worse, on trope ontology, it seems it would become impossible to even form the concept of a trope, nominalism, or anything else. For a concept also would be a trope and thereby subject to the same problems we have seen. [↑](#footnote-ref-19)
20. Maurin, 19. [↑](#footnote-ref-20)
21. Both maintain that only concrete particulars exist. However, “MLN” disagrees with AN in that “the claims apparently about universals are really disguised ways of talking about linguistic expressions” (Michael Loux, *Metaphysics* (Routledge, 2006), 46. [↑](#footnote-ref-21)
22. Garcia, “Two Ways to Particularize a Property,” 635. See also Michael Loux, *Metaphysics: A Contemporary Introduction*, 3rd ed. (New York: Routledge, 2006), 58-69. [↑](#footnote-ref-22)
23. D. M. Armstrong, *Universals: An Opinionated Introduction* (Boulder: Westview Press, 1989), 38. Also, see Moreland, 74, and Loux, 86. [↑](#footnote-ref-23)
24. David Lewis, “New Work for a Theory of Universals,” *Australasian Journal of Philosophy* 61:4 (1983): 352. [↑](#footnote-ref-24)
25. Ibid. [↑](#footnote-ref-25)
26. Ibid. For him, a “Moorean fact” was something that “we know better than we know the premises of any philosophical argument to the contrary” (David Lewis, “Elusive Knowledge,” *Australasian Journal of Philosophy* 74:4 (1996): 549). [↑](#footnote-ref-26)
27. Lewis, “New Work,” 352. [↑](#footnote-ref-27)
28. If someone still objects, in the spirit of Lewis, that even that argument is impermissible, then it seems trope nominalism is not falsifiable on this matter. [↑](#footnote-ref-28)
29. Dallas Willard, “Knowledge and naturalism,” in *Naturalism: A Critical Analysis*, ed. J.P. Moreland and William Lane Craig (New York: Routledge, 1999), 40. [↑](#footnote-ref-29)
30. See Robert Kirk, “Zombies,” *Stanford Encyclopedia of Philosophy*, <https://plato.stanford.edu/entries/zombies/>, revised 2015, accessed April 13, 2017. [↑](#footnote-ref-30)
31. I address the various attempts in chapters in *Naturalism and Our Knowledge of Reality* (Ashgate/Routledge, 2012). [↑](#footnote-ref-31)
32. For a more complete discussion, along with counter-arguments, see *Naturalism and Our Knowledge of Reality,* ch. 2. [↑](#footnote-ref-32)
33. Moreover, on Dennett’s view, I argue that everything becomes an interpretation, without any way to get started. This involves, in part, his denial of any real essences and any real intentionality. See ch. 5 in *Naturalism and Our Knowledge of Reality.* [↑](#footnote-ref-33)
34. Boyle suggested that impenetrability was another such quality. [↑](#footnote-ref-34)
35. They at least have particularity necessarily. See Moreland, *Universals*, 94. [↑](#footnote-ref-35)