

PLATO JOURNAL

Société Platonicienne
Internationale
Associazione Internazionale
dei Platonisti
Sociedad Internacional
de Platonistas
Internationale
Platon-Gesellschaft

Imprensa da
Universidade
de Coimbra
Coimbra
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Press

Triangles, Tropes, and τὰ τοιαῦτα: A Platonic Trope Theory

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ABSTRACT

A standard interpretation of Plato's metaphysics holds that sensible particulars are images of Forms. Such particulars are fairly independent, like Aristotelian substances. I argue that this is incorrect: Platonic particulars are not Form images but *aggregates of Form images*, which are property-instances (tropes). *Timaeus* 49e-50a focuses on "this-suches" (*toiauta*) and even goes so far as to claim that they compose other things. I argue that Form images are this-suches, which are tropes. I also examine the geometrical account, showing that the geometrical constituents of the elements are also Form images. Thus everything in the sensible world is composed of tropes.

Keywords : Particulars; Tropes; Plato; Timaeus; Substance; Metaphysics; Greek Philosophy

https://doi.org/10.14195/2183-4105_18_1

1. INTRODUCTION

In the *Timaeus*, Plato offers an account of the world whereby macroscopic physical objects are composed of microscopic three-dimensional objects, which are, in turn, composed of two-dimensional objects. Most, if not all, properties of macroscopic objects are explained by properties of microscopic objects, which are in turn explained by the configuration of two-dimensional objects. We seem to have a completely reductionist, naturalist account of the world; why, then, is it accompanied by supernatural entities such as Platonic Forms? While I will explain why Forms are crucial for the account of particulars in the *Timaeus*, I will be focusing not on Forms, but on sensible particulars, the three-dimensional objects we bump into on a day-to-day basis, as well as their constituents. I will argue that Plato does not take these particulars as basic constituents of the physical world, but that the ultimate constituents of Timaeus' sensible particulars are what metaphysicians call tropes, or property-instances; Timaeus calls them τὰ τοιαῦτα, “this-suches.” My argument follows:

1. Each thing that comes to be is τὸ τοιοῦτον (this-such).
2. All and only things that come to be are images of Forms.
3. Therefore, τὰ τοιαῦτα (this-suches) are images of Forms.
4. Triangles are τὰ τοιαῦτα or are constructed from τὰ τοιαῦτα.
5. All bodies are constructed from triangles.
6. Therefore, all bodies are constructed from τὰ τοιαῦτα (images of Forms).

The second part of the paper will explain and defend the first syllogism, the third part

will explain and defend the second syllogism (which may be understood as laying out a consequence of the first syllogism), and the fourth part will consider objections. As will become clear in the paper, I take Timaeus' metaphysics of particulars to be a version of a trope theory, and so I take τὰ τοιαῦτα to be tropes, but I will defend this claim in the fourth part; I will also consider the traditional account of particulars in the *Timaeus* whereby Form images are bodies (i.e., physical objects) rather than tropes.

Let me begin by giving an initial characterization of a Platonic trope theory. Tropes are often used to avoid commitment to universals; the universal or Form Whiteness, for example, could be the set of all whiteness tropes. Most trope theories, therefore, are nominalist theories. Timaeus is not, of course, a trope nominalist; his tropes coexist with transcendent universals, Forms.¹ In his terms, a trope is a “this-such” (τὸ τοιοῦτον) or Form image — a trope-theoretic interpretation of Timaeus' ontology is thus not anachronistic, since he himself introduces tropes, as I will show, albeit under the name of “this-suches” (τὰ τοιαῦτα).² When one feels hot, one does not feel heat in general but a particular heat, *this-heat*: a heat trope. Thus the heat in a given fire is not a repeatable entity or “immanent universal,” but a particular entity, distinct from each other instance of heat. This is what I mean by a trope: a particular, non-repeatable instance of a property.

While trope theorists generally take tropes to be fundamental entities out of which universals may be constructed, Timaeus' tropes are dependent upon transcendent universals, as “Form image” implies. So a heat trope is an image of Heat, and there can be many distinct images of the same Form of Heat, each image coming to be and then perishing as something becomes and then ceases to be hot. I take Forms

to be immutable, non-spatiotemporal entities that are universals insofar as they explain commonality in resembling things. Heat explains the commonality in two hot things precisely by having an image of itself — numerically distinct but qualitatively identical — in each hot thing; i.e., two hot things resemble each other because each contains a heat trope.

A trope-bundle theorist would say that sensible particulars are wholly constituted by tropes. Fire is a bundle of heat, color, etc. While I do not here defend a Platonic trope-bundle theory, my arguments naturally lead to such an interpretation. My trope-theoretic interpretation of the *Timaeus* differs from traditional interpretations in that it takes tropes rather than sensible particulars as images of Forms. Instead of holding that sensible particulars have their properties by participating in Forms, a trope-theoretic interpretation holds that sensible particulars have properties by having tropes as constituents. Thus Forms and their images — in contemporary terms, transcendent universals and tropes — play the central role in Plato’s explanation of the sensible world, rather than sensible particulars playing the starring role.

2. τὰ τοιαῦτα

2.1. EACH THING THAT COMES TO BE IS τὰ τοιαῦτα

Timaeus introduces τὰ τοιαῦτα at 49d5, in the midst of a very controversial passage.³ At the heart of the controversy is whether we should take *Timaeus* to say, “fire is τὸ τοιοῦτον (“this such” or “this sort of thing”), rather than τοῦτο (“this” or “that”), or, “τὸ τοιοῦτον, not τοῦτο, is fire.” The debate is thus over which terms are subjects and which are predicates.

The context is a puzzle about the elements, which seem to be too unstable to admit of being called any one thing, since they could, at any moment, change into different elements. Should we say, when pointing at a bonfire, for example, ‘fire is this sort of thing’ rather than ‘fire is this thing’, or should we say ‘this sort of thing is fire’ instead of ‘this thing is fire’?

However one wishes to settle this dispute, we can focus on “this-such” and identify two main interpretations of τὸ τοιοῦτον in the passage. The first, dubbed the ‘traditional translation’ by its adherents, claims that τὰ τοιαῦτα are “temporary characteristics” rather than “self-subsistent” things (Zeyl 2000 lviii, n. 18). The second, which Zeyl calls the ‘alternative translation,’ takes τὰ τοιαῦτα to be “distinct and self-identical characteristics” or “recurrent, stable, and determinate characters” (following Cherniss 1954). I propose, for now, to follow a middle ground, calling them “characteristics;” we will leave aside whether they are “temporary” or “recurrent, stable, and determinate.” We are left with quite a bit of agreement. On the one hand, these characteristics are temporary in at least one sense: they may be at a certain place for only a short time, and that place may be occupied by a different characteristic at any time. Thus the fiery characteristic may be replaced by a watery characteristic at any moment. On the other hand, these characteristics are stable and determinate in at least one sense: for as long as each exists—which may be only an instant—it is *that* characteristic and not some other. It may be identified as belonging to a certain *kind*. So the fiery characteristic is fiery for as long as it exists, even if is replaced by a watery characteristic in but a moment.

On either translation, *Timaeus* generalizes his conclusions to “everything that comes to be” (49e7). Thus every generated entity is a characteristic, not a ‘thing;’ the characteristic

may be replaced at any time by another characteristic, but it remains what it is as long as it is. If we generalize this claim, it applies to any characteristic, e.g., that of being a garbage truck, not just to elements. And there is no reason to think it does not apply completely generally, since Timaeus gives “hot” and “white” as further examples. Even if we think that the properties of being hot and being white are suggested from our discussion of fire, they are widely applicable to macroscopic objects, and we are given no reason to restrict their use to describing elements. In fact, Timaeus cannot be restricting his argument to elements, since he extends it to “anything you can point to,” and it is not, strictly speaking, possible to point to an element, since they are microscopic particles (we can point to some fire or water, but these are macroscopic bodies composed of appropriate elements). Thus we should regard Timaeus’ proscription as perfectly general, as he insists several times: do not call anything that comes to be τοῦτο, but each thing that comes to be is τὸ τοιοῦτον.⁴

2.2. ALL AND ONLY THINGS THAT COME TO BE ARE IMAGES OF FORMS

Timaeus gives two accounts of the universe’s generation, which I take to be complementary in at least the minimal sense that the second does not annul the first.⁵ We have focused on the second thus far. In his first account, Timaeus distinguishes between Being and Becoming. He does not specify the members of Becoming — which would, it seems, include everything in the changeable, sensible world — but he begins with an informative example: the universe, taken as a whole, is in the class of Becoming. In addition, he offers a characterization of this exemplum of Becoming, namely

that it is an image (τόνδε τὸν κόσμον εἰκόνα τινὸς εἶναι, 29b1-2), viz., an image of an eternal, changeless model (παράδειγμα, 29a2-b2). So the demiurge, a divine craftsman, looks to Being in order to make the universe, which is an image of the Living Being that contains all the intelligible living beings as parts *just as* the universe contains us and all the other visible creatures (30c2-d1). I take the “intelligible living beings” to be Forms of animal species, e.g., the Form of Human Being, the Form of Goat, etc. The Living Being that contains all the others would be, then, the Form of Living Being, i.e., the transcendent universal that explains what all living beings have in common.⁶ Thus we have reason to identify Being with Forms, an identification that is confirmed, e.g., at 51d3-52a4. The parts of the universe on which Timaeus focuses, then, are the living parts (including heavenly bodies, which are created gods), and these are all images of animal Forms. In fact, later in the *Timaeus* Becoming is explicitly identified with the class of Form images (48e4-49a1), so that each thing in Becoming is an image of a Form. It is not clear, at this point, what it means to be an “image” of a Form, but this will become clearer when we identify images of Forms with τὰ τοιαῦτα.

Timaeus’ second account marks a significant change in our ontology: instead of two kinds, Being and Becoming, we now have a third, the Receptacle. I will presuppose as little about the Receptacle as possible, since it is a controversial subject.⁷ What I will emphasize is that everything that comes to be — everything in the class of Becoming — is an image of a Form.⁸ It is controversial to say that Becoming is unchanged between the first and second accounts, as some think that the first account’s Becoming is separated into the Receptacle and Becoming of the second account.⁹ But if we bracket the Receptacle, we can apply the

later rule — that everything that comes to be is an image of a Form — to the first account, especially since Timaeus’ first and primary exemplum of Becoming, the universe itself, is explicitly an image of a Form. Thus Form images are the things that come to be, and things that come to be are Form images.

2.3. THEREFORE, Τὰ τοιαῦτα (THIS-SUCHES) ARE IMAGES OF FORMS

Earlier we found Timaeus extending his conclusions about fire to “everything that comes to be.” Thus each thing that comes to be is τὸ τοιοῦτον. It is not a *thing* — at least not as we usually conceive ‘things,’ as physical objects with many characteristics — but a *characteristic*. Now we have seen that Form images exhaust the category of Becoming; Form images are those things that come to be. Thus Form images are τὰ τοιαῦτα. This makes perfect sense, at least if we think of Forms such as Goodness, Justice, and Beauty. Being good, being just, and being beautiful are characteristics, not things; they characterize things. So an image of Goodness should be the characteristic of being good that some particular thing has. An image of Justice is the just character of a particular person or action. And the image of Beauty a beautiful painting possesses is the characteristic of its being beautiful.

But what about other Forms? One of the Forms explicitly discussed in the dialogue is Fire, which Timaeus says must exist over and above all sensible fires (51b7-52a4). But fire is not, one might think, a characteristic. Fire is a *thing*, at least for the ancient Greeks; it is, after all, an element. Timaeus, however, explicitly denies that fire is a thing at 49d5, telling us that fire is τὸ τοιοῦτον (or that τὸ τοιοῦτον is fire). We should think of fire as fieriness; Fire

Itself, mentioned at 51b8, would certainly be understood best as Fieriness, not as a great fire in heaven. It is distinct from each particular fire, but it explains why each particular fire is fire; we should understand this to mean that Fieriness explains why each particular fire, each with the characteristic of being fiery, is fiery, rather than being some other quality. There are many fiery things: each fieriness, that is, each particular characteristic of being fiery, is a particular image of Fieriness itself, just as each just character is a particular image of Justice itself.

A word about the Receptacle: while Timaeus denies that anything that comes to be is a *this*, he turns around to argue that there is a *this* that can be stably designated, although it is not essentially characterized, i.e., in itself it has no properties, or at least no properties that correspond to Forms. The Receptacle evidently has the stability that particulars lack, so that it can be designated reliably, even though entities are constantly coming to be in it and perishing from it. So when we attempt to designate a bit of flame with a demonstrative “this,” we actually designate the bit of the Receptacle in which the bit of flame appears. When we say “that is fire,” speaking normally, what we really do is pick out a location in the Receptacle and assert that it is fiery, i.e., that there is an image of Fieriness in that region of the Receptacle.¹⁰

A proper treatment of the Receptacle, whether it is space, substratum, both, or neither, would take us too far afield, but let us return to the traditional and alternative interpretations. Partisans of the traditional interpretation point out that, according to the alternative, we are using our normal, everyday terms incorrectly.¹¹ We are wrong when we point to a bonfire and name it “fire,” since we should only use “fire” to name the characteristic common to it and every other bonfire. This accusation is, of course,

true; in fact, it seems that the main point of the passage is that we use our everyday terms in a loose and derivative manner. Strictly speaking, we apply terms incorrectly. Although its partisans do not appear to recognize it, the traditional translation actually presupposes a corresponding error, since we only correctly name a bonfire “fire” if we are using the name adjectivally, not designating the bonfire as a self-subsisting thing but only as a temporary characteristic of that space. But our everyday use of the term “fire” is intended to pick out a real, independent thing, not a property: we think there really is a *thing* there, even if it is a thing I can pass my hand through. For example, when I get burned by some fire, I think that there must be a *thing* there that burned me. Since fire may be a strange example of a *thing* to our modern ears, let us instead take a hunk of earth. According to the traditional translation, earth is a temporary characteristic of a part of the Receptacle, not a self-subsisting thing. Calling a hunk of rock “earth,” then, is correct only if we are applying the name not to a *this* but to a characteristic. The alternative translation insists that the name “earth” picks out the characteristic common to this hunk and each other hunk of earth, rather than picking out the physical thing.

The two translations, then, have equivalent conclusions: our normal terms pick out temporary characteristics, not self-subsisting things. The difference is that the traditional interpretation allows us to speak of what we see as fire, while qualifying the nature of fire so that it is not the kind of thing to which we think we are referring, while the alternative prohibits us from calling what we see fire, if we are to speak correctly, since the nature of fire is far different from what we suppose it is. According to both translations, fire is a characteristic, characterizing a bit of the Receptacle.

The Receptacle stands on its own, but fire is parasitic.

Despite their equivalence, the traditional translation is used to support an interpretation whereby particulars in the *Timaeus* are self-subsistent substances.¹² According to Zeyl, such substances endure over time as the subjects and substrata of various characteristics such as fire.¹³ Such a reading relies heavily on an interpretation of the Receptacle as a substratum and cannot be based simply on the translation we have examined. In other words, the traditional translation is not sufficient for a substance-interpretation of particulars; what we have, on either translation, are *characteristics*, not *things*, coming to be. These characteristics, or τὰ τοιαῦτα, are images of Forms, and they exhaust Becoming. Taking Forms to exhaust Being, then, we would be left with three ontological categories: Forms, Forms images (τὰ τοιαῦτα), and the Receptacle.

3. TRIANGLES

We have identified all things that come to be with images of Forms and hence with τὰ τοιαῦτα. But there is another account of the generation of macroscopic objects in the *Timaeus*, namely, that sensible particulars are composed of more fundamental particles—what I will call elemental triangles. In this section of the paper I will show that these triangles are τὰ τοιαῦτα or are themselves composed of τὰ τοιαῦτα, so that our account of sensible particulars stands. Before we discuss these triangles, though, we need to address the context of the passage, where Timaeus tells us that the demiurge brings an unorganized universe, full of formless “vestiges” of elements in discordant motion, into a whole organized by form and number. There are two readings of

this text, a literal, which takes the divine creation in time at face-value, and a non-literal, which takes the cosmos to be eternal and, thus, reads this passage as a myth.¹⁴ At stake is the status of the elements in the pre-cosmic state: did “vestiges” of elements actually exist, and thus must be accounted for, or are they simply a relic of the mythic form of Timaeus’ discourse? I believe my account is neutral between these two readings, but I owe partisans of the literal reading an explanation of how my account is compatible with pre-cosmic vestiges, so I will return to this point after discussing the construction of elements.

Elements are, Timaeus tells us, bodies (σώματα, 53c4-5). Thus, he infers, they are composed of triangles, since bodies have depth, things with depth have planar surfaces, and planes may be broken into triangles. Each elemental body of fire, for example, is a four-sided pyramid with faces composed of six 30-60-90 triangles, and these triangles, when dissolved from their current structure, may join with others to form molecules of water or air. Each elemental body is defined by its number and form, i.e., a certain number of such-and-such triangles organized into such-and-such a shape. So wherever triangles are combined into a tetrahedral pyramid, there is fire. These elemental triangles come to be in the Receptacle, thereby forming parts of the geometrical figures that compose elemental bodies, and elemental bodies, i.e., fire, earth, air, and water, in turn, form ordinary, sensible particulars.

Although he has not said it here, Timaeus must be speaking of the sensible, generated elements — sensible fire, sensible water, etc. — because he tells us earlier that bodily things are sensible and thus also generated (28b7-c2). So we should not immediately conclude that the Form of Fire is composed of elemental triangles, since it is not a body. The Form of Fire

does, however, seem to be structural, since fire is instantiated whenever there is an instance of a given structure — i.e., whenever elemental triangles are arranged in a certain way. Thus we preserve the prior reference to fire as this-such, i.e., such a structure as this, one that includes a certain color, heat, and other properties. These properties taken by themselves, scattered across the Receptacle, do not constitute a fire, but they do so when they are arranged correctly, i.e., when there is a structure that includes these this-suches.

Looking ahead, Timaeus explains fire’s sensible properties by reference to properties of its geometrical constituents; fire is hot because of the small, sharp nature of its body’s angles (61d5-62a5). Fire’s nature is not, then, qualitative, e.g., to be hot, since its heat is explained by reference to its geometrical structure. Heat is a necessary property of fire; it is included as a necessary consequence of fire’s structure, as we see when Timaeus describes the smallness, sharpness, and lightness of fire (55e7-56b2). If fire’s other qualities can be explained likewise, and there is no reason to think they cannot, then fire is simply a structure that necessarily includes certain properties. Thus, elements’ natures are their geometrical structures.¹⁵ The Form of Fire is structural.¹⁶ Notice that we need not say that *all* tetrahedral pyramids are fires, since fire need only be one of the infinite possible kinds of tetrahedral pyramids; in addition, we need not worry that a macroscopic tetrahedral pyramid might burst into flames, if it had the right proportions, since fire is a structure of *elemental triangles*, not a structure of just any triangles.¹⁷ It might help to think of the Fieriness as a universal with twenty-four slots (four faces of six triangles each), each slot being filled by the Form of the appropriate triangle;¹⁸ when fire is instantiated, the twenty-four triangles are also instantiated,

since the fire trope relates the triangle tropes, which, in turn, relate angle tropes, etc.

I can now return to the literal reading of the demiurge's organization of the pre-cosmic vestiges. Let us assume that the vestiges had *some* structure, although imperfect, so that we may continue to assign the nature of the elements to their geometrical structures.¹⁹ Fieriness is structural, and there are imperfect instances of this structure in the Receptacle even before the demiurge sets to work. Each instance of fire would, in these pre-cosmic conditions, be inexactly formed, perhaps with irregular constituents or no constituents at all, such that it would be prohibited from transforming into the other elements in the way that fire can after its geometrical construction. At the time of creation, the demiurge assigns a number to each structure, i.e., he looks to Fieriness and imitates its geometrical structure in the Receptacle, crafting fiery bodies out of a certain number of elemental triangles, which are in turn formed in the Receptacle. Since this structure has been imposed on the bodily elements, they now have a certain regularity and stability: each molecule of fire is a pyramid with regular faces composed of triangles, and these triangles, when dissolved from their current structure, may join with others to form molecules of water or air. In other words, there are now rules for an orderly transition from one element to another, and each elemental body is defined by its number and form. Thus my interpretation of the elements can be reconciled with either a literal or a non-literal reading of the dialogue's creation story.

My account of the elements and their construction raises several concerns. First of all, one might wonder about the consequences of my account for the interpretation of the Receptacle as material or nonmaterial. But my account thus far of elemental triangles

and bodies does not lock us into a particular interpretation of the Receptacle, since we have nowhere assumed that the triangles are bodily or material. In fact, the triangles cannot be bodily, since bodies have depth (53c5-6) and plane figures have no depth. It is also difficult to hold that they are material, since they are, again, only two-dimensional.²⁰ For the same reason, it is difficult to assign any 'containing' ability to the triangles, in order that they may hold in 'stuff' that then makes particulars material: a plane can offer no kind of resistance, let alone contain something.²¹ The triangles do, however, compose elemental bodies which, in turn, compose material particulars, so there is some temptation to call them material. "Material" will, however, mean something peculiar. Contemporary science has acclimated us to the idea that the most basic constituents of reality—fundamental particles—are very different from the objects we see and with which we interact. Just so, Plato's two-dimensional triangles are material in a stretched sense,²² in the same way that non-extended simples might be said to be material in a theory that takes them as basic constituents of material objects.

Second, we seem to have left Form images behind. How do we reconcile them with elemental triangles? There are two main possibilities: first, that triangles are composed of this-suches, even though they are not bodies, and second, that triangles are, themselves, simple images of Triangularity, i.e., images with no further components. While the latter suggestion would be fully compatible with the interpretation presented above, I do not think it correct, since elemental triangles have multiple properties. Timaeus recognizes this when he describes his reasoning in selecting the 'best' triangles: triangles are right-angled, trilateral, shaped, etc. If there is a Form for

each of these properties, elemental triangles must be composed of Form images.

One may object, however, that I am assuming that triangles and their properties are Form images, but Timaeus never explicitly calls them such. Let us recall our treatment of fire. When we say colloquially, “this is fire” (or, “fire is this”), what we should really say, if we were speaking perspicuously, is that *this* is a part (region) of the Receptacle in which has come to be *this-fieriness*. We can generalize this rule to other parts of the *Timaeus*, even though Timaeus speaks in a more colloquial manner in other places. When he speaks of triangles, it might seem that they abide in a way that fire does not. But we could no more pick out “this triangle” or “this pyramid” than we could “this fire.” In the case of “this fire,” we pick out a portion of the Receptacle and a Form image, viz., an image of Fieriness. Similarly, when we say “this triangle,” we are speaking loosely, picking out a portion of the Receptacle and an image of Triangularity. There is no more reason to think that *this-triangle* abides than to think that *this-fire* abides. If fire flees the use of “this,” then so should triangles. Thus, an image of Triangularity is a this-such on the same ontological level as an image of Fieriness or Heat.

In fact, the passage immediately following the “much misread” passage about fire tells us, explicitly, that a triangle is a this-such. At 50a5-b5, when Timaeus tells us not to call a golden triangle “triangle” but “gold,” he goes on to say that we should be content if the triangle (or any other figure molded in gold) accepts the designation of τὸ τοιοῦτον. Since the meaning of “triangle” has not changed between 50a and 53c, we should continue to see triangles as this-suches, instances of Triangularity, which partially constitute elemental triangles.

We have another reason to consider elemental triangles as derivative objects composed of

Form images. *Being hot* is τὸ τοιοῦτον (50a2). Since τὰ τοιαῦτα are Form images, heat is a Form image. Fire is, of course, hot, and Timaeus explains this fact by appealing to its geometrical construction. Fire is a four-sided pyramid with acute angles. These small, sharp angles cut flesh, and that is what we call heat (61d5-62a5). And so heat, an image of Heat, is a property of the elemental body of fire. Since everything made out of hot etc. are τὰ τοιαῦτα (50a3-4), and τὰ τοιαῦτα are images of Forms, pyramids must also be images of Forms. There is no reason to think that the elemental triangles composing those pyramids — triangles which are also made out of their properties — are any different. So elemental triangles are Form images or composed thereof, and the mechanistic explanation of heat is compatible with bodies being composed of Form images.

One may press the worry about triangles and Form images, however, and formulate a ‘third wave’ or ‘greatest difficulty’ for my interpretation of the elemental triangles: such triangles, it seems, abide and persist in a way that τὰ τοιαῦτα do not, and thus elemental triangles are not subject to the worry about elements that leads Timaeus to formulate the this/this-such distinction. In fact, one might say, elemental triangles are the *solution* to this worry: they must persist to underlie the geometrical account of elemental transformation.

My account might lead us to think, in contrast, that triangles are as unstable as any other this-such. They could, at any moment, change into anything else. Indeed, we might even be tempted to say that elemental triangles are new at every moment, i.e., that each triangle in the universe undergoes so-called immaculate replacement, being replaced by a seemingly identical triangle each instant, so that, technically, “nothing is ever the same” (*Phaedo* 78e3-4). Although this is a tempting

way to explain Plato's persistent calls for flux in the sensible world, there are reasons to doubt that elemental triangles are as unstable as the elements they underlie. First, it is not obvious what triangles would change into unless they undergo immaculate replacement, and then we are seemingly positing immaculate replacement just to ensure that things are "never the same," which is circular. Second, it seems that triangles must persist so that the elements can change into each other. It is clear that the same triangles that compose a body of fire can go on to compose a body of air (56e2-7).

Third, Timaeus' discussion of aging (81b5-e5) seems to require that elemental triangles persist. He tells us that in newly constructed living things, elemental triangles are "fresh" and "straight from the stocks" (νέα μὲν οὖν σύστασις τοῦ παντός ζῶου, καινὰ τὰ τρίγωνα οἷον ἐκ δρυόχων ἔτι ἔχουσα τῶν γενῶν, 81b5-7). They are firmly locked together and so they easily overcome and cut up the "older" (παλαιότερα) incoming triangles from food. But when a triangle's "base" weakens (literally, its "root," ἡ ῥίζα τῶν τριγῶνων χαλᾶ, 81c6-7), the living thing's triangles can be overcome by entering triangles, and it enters old age. Death comes when the soul is released, which happens when the interlocking bonds of the marrow's triangles no longer hold together (τῶν περὶ τὸν μυελὸν τριγῶνων οἱ συναρμοσθέντες μηκέτι ἀντέχουσιν δεσμοὶ τῷ πόνῳ διστάμενοι, 81d5-6). Marrow, which anchors soul to body, is made of specimens of the elements with the most precise triangles (73b5-8).

While the information about aging and death might lead us to believe that elemental triangles are themselves destroyed, this is a doubtful reading of the passage. Instead, it seems that the bonds between triangles — either those which hold triangles together into elements, or those that hold them together to

compose marrow, or both — are destroyed. This is also how we should read the claim about triangles' bases, namely, that these refer to how triangles are put together to form the faces of regular solids. When their bases weaken, triangles are more likely to come apart from each other, destroying marrow and releasing soul from body. Triangles themselves re-form with other triangles to compose different elements, although I do not deny that triangles could, in principle, be destroyed; they are, after all, parts of Becoming. Timaeus also seems to refer to the same triangles throughout his description of aging, rather than immaculately replaced duplicates.²³ Thus triangles seem to persist for some time, since they can be "fresh" and newly constructed or "older" and more weakly bonded together.

While it may be that some tension is unavoidable, as Timaeus himself admits (29c4-7), in such an ambitious account of the universe, we can allow some groups of τὰ τοιαῦτα to be more stable than others; in fact, we have independent reason for allowing such a possibility, for the heavenly bodies have come to be and yet appear to be indestructible. Timaeus posits τὰ τοιαῦτα to distinguish Form images and the Receptacle, since Form images have a precarious ontological stability, due to their complete dependence on Forms and Receptacle, and the Receptacle is not dependent on Form images for its existence and stability. Even if elemental triangles or heavenly bodies have a stability that other particulars lack, they are still composed of images, dependent upon originals (e.g., Triangularity) and a medium, and so flee the designation of 'this' or 'that.' They are still destructible, derivative, and impermanent. In these respects, they are no more entities in their own right than elements or other particulars, for they are constructed of more basic entities — τὰ τοιαῦτα correspond-

ing to their properties—and these more basic entities are fully dependent upon Forms and the Receptacle.

4. TROPES

Timaeus' τὰ τοιαῦτα are, I have been contending, tropes, which metaphysicians still call this-suches.²⁴ Consider that, for any property *Fness* corresponding to predicate *F*, we can always call an instance of *Fness* *F*. An instance of fieriness is always fiery—a fiery trope is fiery—whenever it exists. But predicates cannot be applied in a stable, permanent way to any concrete subject that has come to be, since any thing or stuff could be characterized by a different predicate, as *Timaeus* shows at 49d4-6. Predicates can only be applied to tropes and then derivatively to aggregates of tropes, i.e., the things “composed of hot and white and the opposites.” We can concisely demarcate Plato's ontological division between Forms and Form images as the division between properties (universals) and instances (tropes).²⁵

4.1. IMAGES OF FORMS ARE NOT IMMANENT UNIVERSALS

One may object that τὰ τοιαῦτα are not tropes but immanent universals (or ‘immanent forms’).²⁶ *Timaeus* 49e4-7, which gives a more complete formula for τὸ τοιοῦτον (“this-such coming around always in similar fashion in each case and all together”), seems to raise a difficulty for taking Form images as tropes, since τὰ τοιαῦτα here seem more like immanent universals; it seems that one and the same ‘sort of thing’ recurs in multiple instantiations. This recurrence would fit well with immanent universals, which are one and the same in all of

their instantiations. For example, if white were an immanent universal, there would be only one white, although it would be in many places at the same time. Whiteness would ‘recur’ every time there is a white thing, but it would be the same whiteness — numerically one and the same — that is ‘in’ each white thing. In contrast, there are many white tropes, each distinct from the other, but each is equally white. For a trope theorist, Whiteness recurs in white things in the sense that each white thing has a numerically distinct white trope ‘in’ it. So if Form images are immanent universals, then an image of Justice would be one and the same in all instances of Justice, ‘recurring’ in each instance. But if Form images are trope-like, then there are many images of Justice, each one distinct and fleeting.

A trope-theoretic reading can respond to this difficulty by emphasizing that the Form, not the image, recurs; the same Form is imaged, so a characteristic “comes around always in similar fashion” because a single Form is imaged in many locations, not because there is a single, multiply-located image.²⁷ Whiteness recurs in every instance of white because there is an image of one and the same Form in every instance, even though each image is numerically distinct from every other image.

The trope-theoretic reading is, in general, preferable to the immanent universal reading, since Forms would be redundant if there were immanent universals. Immanent universals would do all the work for a theory of universals in a way that tropes do not, since, according to a trope-theoretic interpretation of Plato, Forms still serve as unitary, eternal properties and objects of knowledge. With immanent universals, however, there is already a property that is immutable and can serve as an object for knowledge, so we have no need of Forms in addition. Since the *Timaeus* clearly makes use

of separate Forms—for instance, Timaeus argues that Fieriness is distinct from sensible fires (51b7-c5) — and, moreover, Forms are justified precisely because they are objects of knowledge (51d3-52a4), the trope-theoretic interpretation of τὰ τοιαῦτα is preferable.²⁸

So, if we dismiss an immanent universal interpretation of τὰ τοιαῦτα, which treats them as repeatable, multiply-located entities, we are left with a trope theoretic interpretation, which treats each Form image as a distinct, non-repeatable entity located in one spatial region. To be clear, taking Form images to be tropes amounts to no more than this, i.e., saying that they are non-repeatable instances of properties that are each located in exactly one spatial region at a time. As long as Form images are instances of properties, then we have an exhaustive division between interpretations that take them to be each located at one spatial region (tropes) and those that allow them to be multiply-located in space (immanent universals), as well as reason to prefer the trope-theoretic interpretation.

4.2. IMAGES OF FORMS ARE NOT BODIES

If Form images are instances of properties, then they are tropes. But, despite my argument that all Form images are τὰ τοιαῦτα and τὰ τοιαῦτα are Forms images, one might find in Timaeus' first account of the universe a counterexample to taking them as property-instances. There, it seems, Timaeus discusses *things*, or bodies, not properties, as images of Forms. For example, the universe is an image of the intelligible Living Being. But the universe is not a property; it is a *thing with* properties. So can we say it is τὸ τοιοῦτον without discarding Timaeus' first account?

In fact, the universe is no more an obstacle to a trope-theoretic interpretation of the *Timaeus* than is fire, since both are, in fact, bodies. Just as fire is an elemental body composed of its properties, so is the universe a body composed of its properties.²⁹ Let us review fieriness; it is a structural property, an arrangement of other properties, including heat—which turns out to be the acuteness of the fire molecule's angles. Notice that the fiery trope is structural; it does not *have* other properties, but it *structures* them. Whenever fire is instantiated, a certain arrangement is also instantiated, specifically, a tetrahedral pyramid of elemental triangles. This seems to an observer to be an object, i.e., a fire, and it is the apparent fire that we say is hot, not the fiery trope. The fiery trope is not itself hot, but always includes heat, which is hot.

Since the other elements are explained similarly, we should explain all substantive Forms similarly. Supposing there are Forms of living things, since the Living Being and 'other intelligible animals' play an important role as models (παραδείγματα) in creating the universe, these Forms should be understood as structures parallel to the elements. In fact, the Living Being seems simply to be a structure of animal Forms; the Form of any particular animal, such as Human Being (or Humanity), would, in turn, be an arrangement of various parts that make up human beings. These parts include physical parts such as hearts, which will in turn have parts, ending with elemental triangles and their constituent tropes; but human beings also include non-physical parts such as virtues and rationality. These latter components are Form images, too, and components in the structure of Humanity just as are the physical parts, since all are, in the final analysis, composed of tropes.³⁰

5. CONCLUSION

I have argued that the second category in Plato's tripartite ontology, that of Becoming, is the category of Form images. Moreover, I argued, Form images are tropes, i.e., property-instances, rather than bodies or immanent universals, and particulars are composed of tropes. The elemental triangles introduced to constitute particulars turn out to be composed of tropes as well, so that tropes and things composed of tropes exhaust the category of Becoming. There is, then, no place for sensible, material particulars in Plato's fundamental ontology. Instead, such particulars are derivative entities, constructed from Form images which are, in turn, dependent on Forms and the Receptacle. While Aristotle distinguishes between kinds (substances), such as human beings and animals, and other properties, such as qualities, quantities, and relations, Plato does not: instances of humanity and triangularity are just as 'insubstantial' as instances of whiteness and heat. I have not, however, put forth the stronger thesis here that particulars are *only* composed of tropes, i.e., that they are bundles of tropes, since I have not directly addressed the status of the sole member of the third ontological category, the Receptacle. Given, however, that particulars can successfully be resolved into tropes, there seems little philosophical reason to take the Receptacle to be a substratum in which those tropes inhere. It is more parsimonious to take particulars as bundles of co-located tropes in the space of the Receptacle. Even if we do not fully accept such a bundle theory, however, the ontology of particulars in the *Timaeus* is not a substance ontology but a trope ontology.³¹

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NOTES

1 Ferber 1997 also addresses the question of why there are Forms in the *Timaeus*, giving an analysis of the brief argument for Forms at 51d3-52a7. See his 182-4, for an alternate account of particulars in the *Timaeus* as relational entities rather than substances.

2 There are many accounts of tropes, and I cannot here give a detailed comparison between Plato's tropes and contemporary trope s— this is work for another paper. There is some similarity, however, between Plato's trope ontology and Lowe's four-category ontology — one dissimilarity is that Plato's ontology contains only three categories, Forms (transcendent universals), tropes, and the Receptacle (substantial space). For a defense of taking the Receptacle to be substantial space, see Buckels 2016a. For contemporary accounts of tropes, see, e.g., Ehring 2011, Lowe 2006, Campbell 1990, Armstrong 1989, and Williams 1953.

3 All textual references are to Burnet's OCT *Timaeus* and translations are my own, unless otherwise indicated. Note that Plato uses "τοιοῦτον" in many different ways in the dialogues; I am not claiming that every use of "τοιοῦτον" is a reference to something that comes to be, only that Plato uses it thus in key passages of the *Timaeus*.

4 Miller 2003, 82, argues that the proscription generalizes only to 'all the elements,' not "everything that comes to be." This coheres with his reading of the entire passage as restricted to elements. Harte 2002, 252, n. 162, similarly doubts that the proscription generalizes to all things, since the initial problem "is closely tied to the role of earth, air, fire, and water, as candidate elements in the traditional sense." Broadie 2012, 202-3, also agrees. On this, Miller 2003, 81, writes that "Plato is not concerned with 'phenomenal fire' but with the element fire that we observe," distinguishing between the two so as to avoid the generalization from phenomenal fire to phenomena in general. But it is difficult to distinguish elemental and phenomenal fire, since, as Miller admits, we observe elemental fire, at least when aggregated: it is visible and, in fact, part of all visible things (31b5), so it seems likely that *Timaeus* generalizes his argument regarding fire—the visible element—to all visible particulars, which all contain fire as a part. Cf. 50a2-4, where the argument concerning elements is explicitly generalized to all properties; also cf. Prior 1985, 110; and Silverman 2002, 258: "the lesson applies to the whole of the physical cosmos." A more problematic point Miller makes is that *Timaeus* has not given us reason to think that the extension from

the elements to all sensible phenomena is legitimate (even if he in fact extends it), since the initial puzzle is only about the changing of one element into another. But the elements are the basis for all other sensible phenomena, so if the elements are so unstable that they might transform into each other at any moment, then the things composed of the elements seem to be vulnerable to the same change. Indeed, Timaeus only holds that it is *possible* for one element to cease to be and another to take its place at any time, and it seems true that any given physical object *x* may cease to be what it is at any instant and be replaced by a non-identical, even if extremely similar, *y*.

5 Timaeus ‘restarts’ his cosmogony after about twenty Stephanus pages, so there is a ‘first’ and a ‘second’ account of the creation of the universe. I take it that the two accounts are largely compatible, with the second building upon the first (for one thing, the Receptacle is added in the second, so we have a tripartite, rather than a dualistic, ontology), but this is not uncontroversial. Broadie 2012, 201-2, Johansen 2004, 117, Silverman 2002, 248-56, and Harte 2002, 213-226, also seem to take the two accounts as complementary, although, e.g., Silverman sees the first account as giving us “traditional forms” while the second gives us “geometrical forms,” and he then joins these such that geometrical forms ground matter and place while traditional forms ground qualities.

6 Cf. Broadie 2012, Ch 3, esp. 70-74, who argues that the “Intelligible Animal” here (my “Living Being”) is not a “thick intelligible,” although she admits her argument is not decisive.

7 It is worth pointing out that Form images being τὰ τοιαῦτα, and τὰ τοιαῦτα being tropes, is compatible with either of the two major interpretations of the Receptacle, namely, that it is a substratum (in which case tropes would inhere in it) and that it is space (in which case tropes would be located in its regions). See also note 30.

8 Silverman 2002, *passim*, also recognizes the importance of Form images, which he calls Form copies. His Form copies differ from my Form images in several ways, some of which have to do with our readings of the *Phaedo*. With respect to the *Timaeus*, the biggest differences between our readings (which are both indebted to Cherniss 1954 & 1957) lie in our treatment of the Receptacle (see Buckels 2016a) and geometrical versus “traditional” Forms (see notes 15 & 19). More broadly, Silverman argues that Form copies cannot be destroyed, whereas my Form images come to be and perish; Silverman’s Form copies are thus difficult to distinguish from Forms. While Silverman and I both argue that sensible particulars (i.e., physical objects) are entirely composed of Form copies (in my case, Form images), Silverman retains particulars as a distinct category of Plato’s ontology, while I think they reduce entirely to Form images (see note 29).

9 Cf. Silverman 2002, 261-5, and Zeyl 2014, §6

10 Cf. Cherniss 1954, 128: “If at any time anywhere one tries to distinguish any phase of the phenomenal flux from any other by saying “this,” one

always in fact points to the permanent, unchanging, and characterless receptacle in which are constantly occurring transient and indeterminate manifestations of the determinate characteristics just mentioned [‘the such and such, whatever the correct formula may be, that is always identical in each and all of its occurrences’].”

11 Zeyl 2000, lviii-lix; cf. Silverman 2002, 258-60.

12 Cf. Silverman 2002, 260: “What is at stake between the reconstructionist [alternative interpretation] and the tradition is not so much these linguistic formulae [i.e., how to address particulars] but rather the account of the phenomena themselves.”

13 Zeyl 2000, lxi. Cf. Mertz, 83f, on Plato’s “concrete individuals.”

14 Cf. Cornford 1937, 28-32, Prior 1985, 95.

15 Mohr 1985, 108-15, also argues for such a view. For discussion of how the triangles come together to form bodies, see, e.g., Cornford 1937, 210-30.

16 Silverman 2002, 282, writes that there is an “inexplicable coincidence of geometrical bodies occupying space and properties entering and exiting the place defined by those bodies.” He thinks that there is no essential connection between a certain arrangement of geometrical form-copies (my Form images) and a certain grouping of “traditional” form-copies (hot, yellow, fire, etc.). Thus is it a coincidence that quantitative and qualitative form-copies always fit together, with the qualities entering and exiting the place of the quantities. But I think Silverman (esp. 249f) makes too much of distinguishing geometrical from traditional Forms; I argue that an image of Triangularity is just another τὸ τοιοῦτον. Thus, on my account, Fieriness is a certain species of Tetrahedral Pyramid. Harte 2002, 262-3 and n. 189, has a position similar to mine: “particles of earth, air, fire, and water, as constructed by the demiurge, imitate forms through their geometrical construction; they are structures of space, whose properties, perceptible and other, are parasitic upon their geometrical structure.” Harte avoids Silverman’s problem (the ‘inexplicable coincidence’ of geometrical Forms) but does not explain how geometrical constructions imitate elemental Forms, since she stops short of identifying Fire with a geometrical structure: Harte does not suggest “that the forms of fire and earth are themselves [the type] regular solids.”

17 Cornford 1937, 190, denies that Fire is a certain structure, because we do not say, when we see fire, “there are some pyramids.” Instead, Fire is a combination of certain qualities. The Form is the “meaning of the name ‘Fire,’” and the “quality is the copy” of the Form. But we do not deny that water is H₂O — even that it is *essentially* H₂O — even though we do not, before our first chemistry lesson, say, “there is some H₂O.” “Water” refers to a combination of certain qualities, but this does not prevent us from saying that it is essentially H₂O. Cf. White 1981, 331-4.

18 Cf. Lewis 1986 for discussion of structural universals and Gilmore 2013 for slots in universals.

19 Cornford 1937, 198-206, instead argues that the nature of fire is qualitative. For criticism of Cornford,

see Mohr 1985, 108-15. Johansen 2004, 126-7, seems to give a qualitative explanation, too.

20 Silverman 2002, 278-81, holds that matter or corporeality is an emergent property, a result of the arrangement of geometrical form-copies. If by this he means that corporeality, the property of being a body, is instantiated whenever triangular form-copies are arranged to form a solid, then this seems right. Cf. Silverman 2002, 255f, and Cornford 1937, 181.

21 The position I have in mind here is that the Receptacle acts as a kind of matter or stuff that is contained by the geometrical shapes rather than the view that there is some primitive matter in the Receptacle (and distinct from it), as found, e.g., in Gill 1971; cf. McCabe 1994, 180. I find this latter suggestion implausible, too, as well as unmotivated by the text; for fairly definitive criticism of Gill's view, see Silverman 2002, 267-73.

22 As an aside, holding that triangles compose the universe hardly seems weirder than holding that the strings of string theory, or any other posit of speculative physics, compose the universe!

23 Gregory 2000, 203-5, argues that the elemental triangles undergo no intrinsic change—the only triangles that can change are the triangular faces of the elements air, fire, and water. It is the faces, then, that are “new or “old,” not the elemental triangles.

24 E.g., Schaffer 2001, 247, although Schaffer argues that tropes are better described as “here-suches.” Cf. Ehring 2012, 76-91.

25 By universals, I mean that Forms are transcendent universals, i.e., non-spatiotemporal entities that explain the common features of particulars without being “in” or located with those particulars. The traditional relation of “participation” is replaced with a Form image “being an image of” a Form, which we may interpret as the relation between a trope and its transcendent universal. The transcendent universal explains resemblance among tropes, as each trope is an image (instance) of a Form (universal). Plato does not clearly commit himself to a range of Forms; here I assume a Form for every meaningful predicate, but I examine this assumption further in an unpublished manuscript.

26 See, e.g., Fine 1983 & 1986 for the view that Forms are immanent in particulars.

27 Cf. Mohr 2005, 87: “We can tell that what recurs is the same recurring image by referring it to the original of which it is an image.”

28 Cf. Ferber 1997 about the justification of Forms here. The point about the same Form being imaged in each ‘this-such’ is strengthened if we take ὅμοιον in 49e4-7 (the “similar fashion” in “this-such coming around always in similar fashion in each case and all together”) as modifying the “coming around” with Miller 2003, 81, rather than as modifying τὸ τοιοῦτον (49e5). If we take it with τὸ τοιοῦτον, we might be inclined toward the immanent universal interpretation; the resulting translation, following Zeyl 2000, would read: “‘what is such,’ coming around like it was, again and again.” But if we take it adverbially with περιφερόμενον, then ‘this-

-such’ comes around in similar fashion each time: there need not be the same this-such each time, as the immanent universalist would have it, but a this-such need only come to be ‘similarly’ each time the appropriate circumstances arise. Even if we do take ὅμοιον with τὸ τοιοῦτον, however, tropes are salvageable, since we have an account of what it is for two tropes to be similar, namely that they are images of the same Form.

29 Cf. *Rep.* 476b4-6, where things are said, in passing, to be made out of sounds and colors and figures (τάς τε καλὰς φωνὰς ἀσπάζονται καὶ χροῶς καὶ σχήματα καὶ πάντα τὰ ἐκ τῶν τοιοῦτων δημιουργούμενα). While I merely explain and defend a Platonic trope theory here, in an unpublished manuscript I explore and defend a Platonic trope bundle theory.

30 It is worthwhile to point out that, if the members of the class of Becoming are tropes, then the motivation for taking the Receptacle to be a substratum has been dealt a serious blow. Substances—particulars that are supposed to be composed of tropes and a substratum—feature nowhere in Plato's tripartite ontology if not in the category of Becoming. But they cannot be in this category, since one of their components—tropes—makes up this category, and another of their components—the Receptacle, taken as a substratum—makes up a different category. Thus substances would have to be a conglomeration of the two categories, Form-images and the Receptacle, whereas, in the text, Form-images are said to be the product or ‘offspring’ of Forms and the Receptacle (50d2-4). There is plenty of room for particulars in Plato's ontology, but only if they are wholly composed of tropes, as I argue in Buckels 2016a. The argument of this paper, together with the argument of that paper, go most of the way toward establishing Plato as a trope-bundle theorist.

31 I would like to thank Thomas Chance, Cody Gilmore, Peter Larsen, John Malcolm, Vasilis Politis, Allan Silverman, and Jan Szaif for valuable discussion of this paper and previous drafts, as well as audiences at the Eastern and Central Division Meetings of the American Philosophical Association, the London Ancient Science Conference, the University of California Davis, and Trinity College Dublin.