C.D. Broad on Things and Processes: A Process Ontology of Tropes

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Abstract

In <u>Examination of McTaggart's Philosophy</u>, C.D. Broad advanced a distinctive ontology of things and processes. He argues that neither things nor processes are reduced to each other but instead are reduced to some further kind of entity: "absolute process." This paper will present Broad's theory of absolute processes and argue that they are best understood as tropes by developing a version of Donald C. Williams's trope ontology. This process ontology of tropes is then defended against objections in the contemporary metaphysics literature.

1 Introduction

In between the two world wars, analytic philosophy emerged as a separate philosophical tradition. Before ordinary language philosophy and the later Wittgenstein took hold of British analytic philosophy, several metaphysical treatises were written that fall within the analytic tradition. One such work is C.D. Broad's <u>Examination of McTaggart's Philosophy</u> (1933; 1938). In his examination of J.M.E. McTaggart's definition of substance, Broad outlines an occurrent-continuant ontology of tropes and expounds his own theory of things and processes. The terminology of "occurrents" and "continuants" dates back to W.E. Johnson's <u>Logic</u> (1921-1924). In analytic philosophy today, the concept of an occurrent and a continuant are put to work in philosophy of mind (Bartlett 2018), philosophy of action (Steward 2012), and especially metaphysics, where occurrents and continuants figure in analyses of persistence and substance (Simons 2000). The impact of Broad's theory of things and processes is harder to assess. Along with Johnson, G.E. Moore, F.P. Ramsey, Bertrand Russell, L. Susan Stebbing, and others, he is part of the tradition of analysis that hailed from Cambridge. But the literature contains only a handful of articles that discuss his theory (Nelson 1947, 493-495; Russell 1959, 263-273; Sellars 1981; Wisdom 1934, 210-215). Still, Broad was influential in other ways, contributing to debates about free will, time, emergentism, and the mind-body problem. Given his place in the Cambridge school of analysis and the caliber of his work, a discussion of his theory of

things and processes should prove fruitful and interesting.[1]

There are further reasons for such a study. First, on Broad's view, things are not reduced to processes, nor are processes reduced to things. Instead, he posits a third category--absolute processes--and reduces things and processes to absolute processes. This novel category deserves to be studied in its own right. Second, this category is relevant to the development of trope theory in the mid-twentieth century. Donald C. Williams's (1953a; 1953b) one-category trope ontology is influenced in part by Broad's interpretation of G.F. Stout's theory of abstract particulars. Third, a discussion of Broad can provide resources for a nuanced formulation of Williams's trope ontology and afford one way to respond to a persistent objection by D.M. Armstrong (1989, 115) and John Heil (2012, 92n8; 2018, 118), namely, the objection that trope theorists turn tropes into "junior substances" and thereby undermine the goal of reducing substances to tropes. Robert K. Garcia has teased out a consequence of this objection, which is that tropes are not significantly different to the multiply charactered objects posited by extreme nominalism (Garcia 2015, 649). If the theory to be developed is defensible, it should be taken seriously as one candidate theory of occurrents and continuants in contemporary metaphysics.

In what follows, this paper will present Broad's ontology of absolute processes (section 2), extract the notion of a quality-range and explain its significance in his theory (section 3), and argue that his theory is incomplete in the sense that the category to which absolute processes belong remains underspecified, which prompts the suggestion that they are best understood as tropes; and so in light of Broad's theory, a version of Donald C. Williams's trope ontology is developed, which says tropes are abstract occurrents and, conversely, that processes are tropes (section 4). This process ontology of tropes is defended against a family of objections in the contemporary metaphysics literature (section 5), and it is concluded that a process ontology of tropes is one of the more plausible formulations of the one-category version of trope theory (section 6). This paper, therefore, has two goals: to articulate a theory of processes by a figure in the history of analytic philosophy and to show how it is relevant to contemporary debates in metaphysics.

2 Reduction of Things and States of Things to Absolute Processes

To understand Broad's theory, it is best to begin with his criticism of McTaggart.

McTaggart (1921, 68) proposed:

> (MC) x is a substance =df x is an existent, and x has one or more qualities or stands in one or more relations to some other existent (and x is not a quality, relation, or fact).

If (MC) is true, a sneeze, a lightning flash, and aggregates of tables are all substances. However, while tables and chairs are substances, sneezes, flashes of light, and aggregates are not (Broad 1933, 132). For Broad, the appropriate notion is expressed by the term "particular." Thus, substances and events are both particulars and have characteristics. (The property of being a particular and being a characteristic are primitive and correlative.)

Broad argues that McTaggart overlooks Johnson's distinction between occurrents and continuants (Broad 1933, 138). This distinction divides particulars into two fundamental kinds. An occurrent is the kind of particular that occurs. A continuant is the kind of particular that continues to exist across time, retaining its identity (enduring, as it were). A noise and a flash of light are occurrents. Sometimes occurrents are called "events." Sometimes a plurality of occurrents concurring in a region is the event as opposed to any one occurrent in the plurality (this difference will be glossed over). My coffee mug and this desk are continuants. Continuants are called "things" or "objects." Throughout, "thing" refers solely to continuant; it is not used as a catch-all term for entity.

The existence of these two kinds of particular can be derived from "common opinion" (Broad 1933, 139). Broad says: "most people believe, rightly or wrongly, that there is [such] a fundamental distinction" (Broad 1933, 138), and "it is so deeply rooted in our language" (Broad 1933, 142). This motivation is echoed in Peter Simons's claim that the occurrent/continuant distinction is "deeply embedded in our common sense conceptual scheme" (Simons 2000, 60). Broad recognizes that the argument establishes the existence of something based on "linguistic fact" (Broad 1933, 150). He concedes that we should not appeal to this sort of argument as a matter of principle, because certain sentences with different meanings can express the same fact, which indicates that a linguistic fact may not reflect some ultimate fact about the nature of things. Nonetheless, in this case the reason is legitimate while not

conclusive. Whoever rejects such a distinction has the burden of explaining why in ordinary thought and language we readily make the (alleged) mistake of drawing the distinction (Broad 1933, 142).

On one interpretation of "occurrent" and "process," an occurrent or a process is a state of a thing. Thus Edward W. Strong writes:

> The phrase "things in process" intends no existential separation of process and thing. To say that a tree exists is to say that it is a persistent or continuant thing. The before-and-after of discriminated stages of growth constitute a continuity of events in respect to the individual continuant (Strong 1935, 55, note).

Similarly, Stebbing calls the states of a thing "occurrences" (Stebbing 1942, 266).

Broad explores the prospect of reducing things to processes and processes to things. He frames the question of reduction in terms of one set of sentences being replaced with another set "without loss or gain of meaning" (Broad 1933, 151). If things can be dispensed with, then for every sentence that contains a thing-name there is a replacement sentence that contains a process-name. Put anachronistically, the question concerns the primitive ideology of the fundamental description of reality. If the book of the world contains process-names and not thing-names, our metaphysics need not posit things as fundamental entities (cf. Sider 2011, passim). Things would be dispensed with as they would not be mentioned in the fundamental description. But this does not imply that the notion of a thing is bankrupt. It is just that the notion is "less ultimate" (Broad 1933, 166).

Broad rejects the view that processes qua states of things can be reduced to things and the view that things can be reduced to processes qua states of things. He argues that some third kind of entity serves as the reductive ground for both. He calls this third kind of entity: absolute process. To illustrate, take the whirring noise coming from the kitchen. It is an occurrent but it has characteristics such as being loud, being of a certain timbre, and being of a certain pitch. It is not a characteristic; it is not a state of a thing. Here is one case of a candidate process that is not a process in Strong or Stebbing's sense. Not every process is a state of some thing, because some processes such as noises and flashes are not states. A flash simply occurs. It is not something that

happens to a thing. So, the reduction of processes (qua states of things) to things fails.[2]

For Broad, these kinds of entities have motion. The movement of my Australian rules football or a microphysical particle can be slow. Hence, not all cases of movements are cases of things moving. Like the noise, the movement of the particle is a "substantive"; the loudness and the speed of each are "adjectives" (Johnson 1922, xi-xiii). To be clear, this does not entail that this noise and this movement are substances (see Teichman 1974, 20).

A noise is an absolute process. A noise can perdure and if it persists it has phases. Suppose I hear a whirring noise for two minutes, it stops, and then I hear it apparently five minutes later for another two minutes. The noise I heard initially is not the same noise I heard five minutes later. Rather, each noise is a distinct phase of a longer four-dimensional process that has each noise as a successive though not adjoined part. Broad argues, "on reflexion," we (ordinary people) do <u>not</u> think it is the same whirring noise; rather, these two noises are part of the same process (Broad 1933, 148). By contrast, we do not think the same about the chair. Our ordinary understanding of the situation is that of a three-dimensionalist theory of persistence (for objects). This observation is not in conflict with the hypothesis that each continuant is a bundle of occurrents. If things are reducible to processes and phases (occurrents), certain bundles of such entities deserve to be called "continuants" insofar as these bundles are good enough occupants of the continuant-role.

The example of a noise illustrates the concept of an absolute process in <u>some but not all respects</u> (Broad 1959, 739). A noise may be causally dependent on other (distinct) entities but it is not constitutive of the concept of an absolute process that every absolute process is causally (or ontically) dependent on other entities. A noise may be causally dependent on a bird that sings. Nonetheless, we can say that each phase of the noise is of the same (absolute) process because it has the same causal source, despite the fact that the phases are not directly related or that one is not the immediate predecessor of the other. Moreover, not all absolute processes are ontically independent. A noise or a visual <u>sensum</u> is an absolute process but is ontically dependent on some other entity.

Broad thinks that physical movement such as the movement of the football is also an absolute process. And he wants to maintain that absolute processes have motion. Briefly, his idea is that physical objects are composed of fundamental particles

that have states but that really the states of these particles are (unsensed) absolute processes. That is, states of microscopic things do the work in explaining the processes of macroscopic things and these microscopic states are absolute processes. It is plausible that: ". . . those macroscopic processes which are commonly regarded as translations of things are really transmissions of microscopic absolute processes" (Broad 1933, 162-163). So, at the fundamental level of our universe, absolute processes are the base ingredients for macroscopic states of things. Our fundamental ontology need only contain absolute processes, which are ontically independent or at least not dependent on things. This leaves open the possibility that some fundamental physical absolute processes ontically depend on each other.

A process has temporal parts, which Broad also calls "successive total phases" (1933, 147); whereas a thing does not have temporal parts. This difference is so well-known that it does not need explaining. Interestingly, Broad specifies modes of composition to ground this difference. Adjunction is the mode of composition that operates on processes. For any temporal parts p1, p2, . . ., pn of process P, p2 is adjoined to p1, p3 is adjoined to p2, etc. Hence, the dome of Saint Peter's Basilica is not part of the history, although it is part of the basilica. And, therefore, the history of the dome is not part of the basilica. Of course, the history of the dome is part of the history of the basilica. Things and their parts obey another mode of composition that governs a distinct part-whole relation. Typically, this mode of composition is understood as the standard mode of composition that is studied by classical mereology.

It is clear that each mode of composition forms complexes and that any phase of a process is a "part" of that process. Adjunction, at the very least, does not obey unrestricted composition. A process cannot be composed of a scattered plurality of phases. So, if unrestricted composition is a sufficient condition for any mode of composition to count as mereological, adjunction is a non-mereological mode of composition. If things are reduced to absolute processes, the mode of composition that operates on things may well be non-primitive, in which case Broad would not be committed to multiple primitive modes of composition. So, he would not be committed to compositional pluralism. For discussion on compositional pluralism, see McDaniel (2014).

Broad endorses an inheritance principle for processes and their parts (phases).

Process P inherits its characteristics from the characteristics of its parts. Example: a movement is fluctuating, where the movement varies periodically. If we take the movement as a process composed of shorter phases, the fact that it fluctuates and varies periodically depends on what its phases are like at those shorter intervals. Broad does not consider the possibility of some (absolute) process that is simple (and so not composed of shorter phases) but has temporal extension. However, this possibility is not incompatible with the main tenets of the theory.

Broad holds the following identity criterion of processes, that is, a unity principle that outlines when two or more phases belong to the same process:

> (IP) Necessarily, there is a single process P such that p1 and p2 are phases of P iff p1 and p2 stand in some succession relation R.

Broad allows for two ways to specify R: (i) p1 and p2 can be indirectly related such that they are successive (though not adjoined), as in the case of a noise with phases occurring at disjoined intervals that have the same causal source, or (ii) p1 and p2 are directly related such that they are successive (immediate predecessor); in the latter case, p1 directly causes p2 and is adjoined to p1. Relation R has to do with counterfactual or causal dependence, or same causal source, or partial identity (where one phase is partially identical with another, which implies some sort of overlap).

It is not the case that necessarily, for any absolute process P, it has partially overlapping phases. A process of finite duration can be composed of successive phases "without gaps and without overlaps" (Broad 1959, 736). There is no "natural division" of a process into adjoined successive phases. Rather, there is semantic indecision about phase-candidates of a process, that is, it is semantically indeterminate which phase-candidates deserve the name "phase" (cf. Lewis 1993). This kind of vagueness or ambiguity is harmless.

Here ends the exposition of Broad's ontology of absolute process. The paper will turn to an interesting feature of his theory that concerns the way we should understand predication of absolute processes and their phases.

3 Explanation of Quality-ranges of Absolute Processes

Broad's aim is to reduce things and processes qua states of things to absolute

processes. For this to work the fact that processes are subject to change or can stay the same over time needs to be explained. Such an explanation cannot make reference to things. It can only make reference to absolute processes and their phases. Suppose I hear a noise for ten minutes. It has the same pitch over this ten-minute interval but it has slowly gotten louder. I hear the change in loudness and constancy of pitch. The noise over the ten-minute interval can be analyzed in terms of its successive total phases. That is, change of loudness is analyzed in terms of qualitative variation of phases. Nowadays, this is a common four-dimensionalist move, but in Broad's day it most certainly was not.

Broad is concerned with the explanation of qualitative similarity or lack thereof among phases of a single process. Qualitative aspects of phases are not the ground of the variation across a process. Interestingly, he introduces the concept of a quality-range, takes it as primitive, and uses it to define the notion of a "determinate quality" (Broad 1933, 160). A more standard four-dimensionalist view goes in the other direction, positing determinate qualities that define up more global facts of qualitative variation. To illustrate, take the ten-minute noise above. Suppose it increases in loudness and then abruptly stops. Broad says that we cannot attribute a degree of loudness to the ten-minute process, nor can we attribute this characteristic to any phase of the process. An "instantaneous cross-section" of the process is the more suitable candidate for having a degree of loudness. But the cross-section is not a phase. It is a "highly artificial construction" (Broad 1933, 160). He thus distinguishes between cross-sections (time-slices) and phases. Phases are the meatier chunks of a process and its true constituents. This sort of proposal in the context of the growing block theory of time has been put forth by Katarina Perović (2021, 640-44).

Although we cannot attribute a degree of loudness to the process or its phases, we can attribute a range of loudness. Broad writes:

> Quality-ranges, in this sense, belong only to processes and their phases, and it is doubtful whether any other characteristic but quality-ranges can properly be predicated of processes and phases. (Broad 1933, 160)

The property being a definite intensity is not, strictly speaking, had by a phase or a process. Some phase or process has it in a derivative sense, that is, in virtue of having,

or better, falling within some quality-range.

The concept of a quality-range is primitive, but there are facts about quality-ranges that improve our grasp of such a concept and its role in Broad's theory.

Fact 1. Each quality-range has a magnitude. Example: a five-minute noise that had the same loudness from start to finish has a loudness-range of zero. This is true even if during the five minutes, say, for all of the third minute, there is variation of loudness for that phase (only).

Fact 2. A quality-range for some phase of some process might be finite (non-zero), while the quality-range for the process is zero. Example: take our five-minute noise. It starts and finishes with the same loudness but suppose it dropped abruptly in loudness at the third minute. The process as a whole has a zero range of loudness, but each phase has a finite range of loudness.

Fact 3. If each phase of some process has zero range, so does the process as a whole. Example: a five-minute noise at the same level of loudness throughout. This follows from the inheritance principle specified above.

Fact 4. For any process $\underline{P}$, for any quality-range $\underline{Qr}$, for any degree $\underline{d}$ of $\underline{Qr}$, $\underline{P}$ has $\underline{Qr}$, $\underline{Qr}$ is degree $\underline{d}$, there exists some integer $\underline{n}_d$ such that any phase $\underline{p1}$ of $\underline{P}$ that has a duration less than $1/\underline{n}_d$ of $\underline{P}$'s duration has $\underline{Qr}$ to a lesser degree than $\underline{d}$ (has $\underline{Qr}$ to degree $\underline{d}$-minus-1).

The idea behind this fact concerns infinite descent of degrees of quality-ranges. Thus, any noise can be analyzed into an infinite series of successive instantaneous events or time-slices, where each event has a "perfectly determinate degree of loudness" (Broad 1933, 161). Recall that the event of a phase has a determinate degree of loudness in virtue of the quality-range.

Fact 5. Quality-ranges also differ in <u>position</u>. Noise $\underline{N}_1$ and $\underline{N}_2$ have degree $\underline{d}$ of loudness-range but differ in position on the scale of loudness. Suppose $\underline{N}_1$ and $\underline{N}_2$ both have zero loudness-range ($\underline{N}_1$ and $\underline{N}_2$ are of the same loudness throughout). Noise $\underline{N}_1$ could be louder than $\underline{N}_2$. Hence, $\underline{N}_1$ is positioned higher on the scale of loudness.

Broad further describes various possibilities given that loudness-ranges either co-terminate or do not co-terminate on the scale. For example, for noise $\underline{N}_1$ and $\underline{N}_2$-- each with a finite loudness-range--to be successive phases of a single noise $\underline{N}$, their loudness-ranges must co-terminate. These quality-ranges are 'co-terminous' (Broad 1933, 161-162). The word 'co-terminous' means that two quality-ranges share a

terminus on the relevant scale. Two co-terminous quality-ranges are never partially overlapping, that is, either they are non-overlapping or wholly overlapping on the scale.

To achieve a comprehensive reduction of things to absolute processes Broad must explain visual sensibilia and their physical correlates.[3] Auditory experiences are experiences of sound-processes. It is more likely than not that visual experiences are of the same kind as auditory experiences (a similar inference may be made for other kinds of experience that are derived from other sense-modalities or mixtures of them). Therefore, it is likely that visual experiences are experiences of visual-processes. The main premise of this argument is motivated by the virtue of unity. The hypothesis that visual sensibilia are not processes but auditory sensibilia are is less unified than the hypothesis that they are both processes.

Take a red patch. It is a visual particular. It is, for Broad, a process. He borrows from John Wisdom (1931, 463) the label "coloring" for color-processes. The red patch is a "redding." A green patch is a "greening," and so on. Broad has to explain rest and motion of visual sensibilia such as the fact that the red patch moves. He explains these facts in terms of a certain kind of quality-range, namely, a place-range. To see this, let us consider sounds again and work our way to the visual case. The car, say, is on the street. It starts and drives off. A change in intensity of the sound is heard as the car moves.[4] He explains this fact in the same way he explains the fact of variation of loudness and scale. Thus, each noise has a place-range in addition to some loudness-range. The same is true of phases. Just like a loudness-range has position on some (one-dimensional) scale, a place-range has position on a (three-dimensional) scale. Suppose every phase of noise $\underline{N}_1$ has zero place-range, then $\underline{N}_1$ is stationary. Suppose successive adjoined phases of $\underline{N}_1$ have a finite place-range and the place-ranges of these phases are co-terminous, then $\underline{N}_1$ is in motion.

Now consider the redding. First, it does not have the determinate character being red, in the same way that a noise does not have a determinate loudness. Colorings and phases of colorings have quality-ranges: color-ranges, shape-ranges, extension-ranges, and place-ranges. No coloring and no phase of a coloring has a determinate color, shape, extension, or place. However, a determinate color can be attributed to an "instantaneous cross-section" of a coloring. This is derived from facts about its "location" in a quality-range or a combination of quality-ranges (Broad

1933, 165). Second, the movement of the red patch is similarly explained in terms of facts about the place-range of the redding. The redding has successive phases that have finite place-ranges and these place-ranges are co-terminous on the scale.

We might think visual experiential items are categorially different from audible ones. Colorings often happen over long periods and their phases often have zero quality-range (in that colorings stay the same over long periods and perhaps over the life of the coloring). Also, phases of colorings can have finite and co-terminous place-ranges but also have zero (or near zero) color-range, shape-range, and extension-range. These are cases of colored patches in motion. A coloring might have finite color-range with zero (or near zero) place-range, shape-range, extension-range. This would translate as a colored patch remaining still but undergoing change of color. In contrast, sounds are typically short. If a noise occurs for some length of time, usually it and its phases do not have zero or near zero loudness-range and pitch-range. Sounds also have fewer quality-ranges than colorings. Noises do not have the quality-range of shape or extension. Hence, we err in saying that visual experiential items are different from auditory ones. Once we see the fuller meaning though, his proposal should not jar that much with common sense. Remember too that the project is to dispense with thing-ideology in the fundamental description of reality.

4 A Trope Theory of Processes

Broad's goal is to construct a theory according to which the category of absolute process is the one fundamental category, from which members of other categories (such as things and processes qua states) are derived. In one respect his metaphysics is incomplete. To see this, let us adapt Williams's claim that metaphysics has two main branches: ontology (analytic or speculative) and cosmology (analytic or speculative) (Williams 2018, 24). The metaphysics of process falls under <u>analytic cosmology</u>: the a priori, critical study of time, space, event, process, and related notions such as duration, succession, and causation. Even if absolute process is a fundamental category, there remains the question of whether they are particulars or universals--a question for <u>analytic ontology</u>.

Broad has told us that processes and occurrents are particulars. Helen Steward similarly says that processes are, in the right contexts, countable particulars. She calls them "individual processes" (Steward 2013, 804). However, more needs to be said

about the ontic status of processes and occurrents. They are not simply particulars. Moreover, if they have characteristics, the problem of universals breaks out at the level of processes, which calls into question whether absolute processes are the one fundamental category.

It shall now be proposed that absolute processes and occurrents are best understood as tropes. For this suggestion to have any plausibility a trope theory of processes needs to be developed. Williams's one-category ontology of tropes is introduced to do this. Part of the motivation is to clarify what a trope is. His view is often misunderstood and dismissed unfairly. It is more plausible than is typically thought (see Fisher 2018; 2020). If tropes are processes or occurrents, the two theories go hand in hand. That is, the ontological and cosmological theses come together to describe the full nature of the members of the one fundamental category. The theory that processes are tropes provides the ontological story and the theory that tropes are occurrents provides the cosmological story. This added interpretation will help complete Broad's theory.

According to Williams, tropes are members of the one fundamental category of being, the category of trope or abstract particular. Straightforwardly, then, an occurrent is a trope. A continuant is also a kind of trope, because a continuant or thing is a bundle of occurrents. Williams does not think tropes are particularized properties, although that is a common way to refer to them. A trope is an occurrent but it is also a manifestation of a kind. This does not imply that the occurrent is an instance of a universal, since that would suggest the existence of universals and imply that the occurrent is complex in virtue of having metaphysical constituents. As Broad says in his formulation of trope theory: "There is no such internal complexity in an occurrent, and there are no universal perfectly determinate Qualia in each of which a plurality of Haec can participate" (1933, 139-140). This coheres with Williams's thesis that a basic trope is metaphysically simple; it is not what it is because it instantiates some universal. For defenses of trope simplicity in contemporary metaphysics, see (Hakkarainen and Keinänen 2017; Maurin 2002, 19; 2005).

It is hard to pinpoint what Broad's position would be on this issue. If his remarks about Stout's trope theory are brought in, he prefers the view that an occurrent is a manifestation of a determinate quality (universal). A squeaking is a manifestation of squeakiness at a spatiotemporal region (Broad 1933, 133). If the

quality-manifestation is the occurrent, a process is a manifestation of a quality throughout some spacetime region (see Russell 1959, 265). Furthermore, in Broad's attempt to dispense with physical movements of things, he proposes that qualities pervade spacetime regions (on a substantival theory of space and time). Physical movement of things is reduced to movement of qualities, where qualities move in virtue of pervading one region and then another (Broad 1933, 158). A process such as a redding, then, is a pervasion of a spacetime region by a determinate quality (redness). On Wisdom's view, a redding is either a quality (universal) or it contains a quality because it is a quality-pervasion (Wisdom 1934, 211), which entails that the redding is complex; whereas Broad says a redding is a particular and he should also say it is metaphysically simple. On the trope-theoretic interpretation, then, if an occurrent is a quality-pervasion, the quality must be a trope, or if there is no real difference between a trope and a manifestation of a quality, the quality-pervasion itself is a trope, although an explicit denial of universals must be added. Again, it is not clear what Broad would say about this, but the trope-theoretic interpretation of his theory of processes is quite natural.

Williams is more decisive. In "Universal Concepts and Particular Processes," he subscribes to the event/process version of trope theory:

> Though we have introduced them in the role of so-called "properties" or "characters" of things, that is, qualities and relations and the structures compounded of these, they may be even better recognized in <u>events</u> like eclipses or sneezes and such otherwise anomalous entities as sense data and geometrical figures, which have the advantage that they more plainly are particulars (2018, 69).

As this passage indicates, while tropes play the role of properties and relations, these roles are not the only ones that tropes play. Tropes play the role of events and processes too. Indeed, the concept of a trope is grasped better through examples of events and processes. Williams goes on to refer to them in same way as Broad: "take the whiteness tropes in these two pieces of paper; let us call them as Stout and Broad have done, two 'whitings'" (Williams 2018, 70).

In "The Elements of Being," citing A.C. Benjamin's (1936, 73-74) theory of

occurrents, Williams says:

> [Benjamin] is right, I think, that in principle the distinction between occurrent and continuant cuts across that of abstract and concrete, but the occurrents we talk about are generally abstract, the continuants concrete. What I said about events as tropes must be understood in the light of this (2018, 50n10).

To understand this passage, it should be noted that Williams applies a part-whole interpretation of the abstract/concrete distinction to occurrents and continuants. On this interpretation, the notion of abstract is such that an abstract entity is a certain kind of part. A concrete whole has concrete parts, to be sure, but it also has abstract parts. Its abstract parts are tropes (see Fisher 2020). Thus, there are abstract occurrents and concrete continuants. He recognizes that there are also concrete occurrents (which just are continuants) and possibly there are abstract continuants. Events are occurrents (or pluralities of occurrents). Certain occurrents within a spatiotemporal region are parts of a concurrent sum, which compose a continuant. As before things or objects are continuants. Since a trope is an occurrent, abstract occurrents are locatable in spacetime (the trope pervading a region). Williams further thinks that some abstract occurrents can exist on their own. Williams and Broad both recognize that a flash can exist on its own. A flash need not be associated with some object or substance. In other words, a flash is a free-floating trope (Campbell 1990, 55). It is an abstract occurrent.

This completes the development of Broad's theory in a trope-theoretic framework based on Williams's one-category trope ontology. A family of objections against trope theory in the contemporary metaphysics literature will now be addressed.

5 Defense of the Trope Theory of Processes

Armstrong presented the objection in Universals (1989) as a rejection of the bundle version of trope theory, with the wider conclusion that the best formulation of trope ontology is the substance-attribute version according to which each trope is a particular mode of some substance. The objection has been restated by Heil--who upholds the substance-attribute version of trope theory--and developed by Garcia. This family of objections begins with the premise that monadic tropes have shape, size, and

duration. If trope T̲ has shape, size, and duration, "the trope is swelled up a bit" (Armstrong 1989, 115). Trope T̲ is really a "junior substance," but shape, size, and duration are properties; so, for the trope theorist they too should be tropes, not features of tropes. As Heil puts it, if trope T̲ has a spherical shape, T̲'s sphericity is a way T̲ is, so T̲ is a substance (Heil 2012, 92n8; see also Heil 2018, 118). A junior substance is still a substance. Lastly, trope theory is no different or better than extreme nominalism, since tropes, like concrete objects, are primitively multiply charactered entities (Garcia 2015, 649). After all, trope T̲ is a multiply charactered entity in virtue of having a shape, size, and duration. If these alleged features are not tropes or are not further analyzed, trope T̲ is primitively charactered. Hence, trope T̲ closely resembles W.V. Quine's red roses and red sunsets (Quine 1953, 10) as well as the charged and massive things of Joseph Melia's sensible nominalism (Melia 2005, 71-72). In sum, the trope turns out to be a kind of substance and yet one goal of trope ontology is to reduce substance to tropes.

If tropes are conceived as absolute processes, this objection can be dealt with. The response is that the premise is, strictly speaking, false. Each trope qua absolute process, as well as its phases, do not have shape, size, duration, etc. Instead, they possess quality-ranges such as shape-ranges, extension-ranges (both spatial and temporal), and place-ranges. Shape, size, and duration are had by instantaneous cross-sections of phases or of absolute processes. If the analysandum is a thing with properties (say, a rose extended in space), the occurrents that constitute the rose do not have the property being extended. It is not as if there is an object with extension, which is analyzed in terms of littler objects with extension.

The closest suggestion to this response in the contemporary metaphysics literature is given by Markku Keinänen (2011), who conceives of tropes as basic physical quantities (mass tropes, charge tropes, spin tropes, etc.) and who denies that tropes have a definite size (Keinänen 2011, 445). While Keinänen denies that a trope has a definite size, he takes the trope to endure, whereas, on the process version of trope ontology, a trope is a perdurant. That difference aside, a trope qua physical quantity is best understood as having magnitudes or as coming in magnitudes, as opposed to having determinate qualities. This quantitative conception is best understood in terms of the more general notion of quality-ranges. Any quality-range is not defined in terms of the difference between the relevant determinate quality of the

first and last phase. Instead, the difference (or range) is the magnitude of the quality-range. If this response to the objection is accepted, the view that tropes are absolute processes should be endorsed (for discussion on quantity tropes, see Keinänen, Keskinen, and Hakkarainen 2019).[5]

It might be objected that it is a conceptual truth that if x stands in spatiotemporal relations to other entities or is located at a region, x has a size, shape, and duration. So, it is false that a process has no size and shape and duration. Response: the process has the corresponding quality-ranges, strictly speaking. So, in the strict sense this conceptual truth is denied, but in the loose sense it is preserved because processes do have quality-ranges. As Broad shows, quality-ranges are an adequate substitute for shape-qualities, size-qualities, temporal-extension-qualities, etc.

It might be objected that the objection applies equally to quality-ranges. It is granted that a red-trope is not red but it has the characteristic being of a color-range of 0. If so, it has turned into a substance. Being of a color-range of 0 is a way this red-trope is, as Heil would say. Response: this objection presupposes a substance-attribute version of trope theory. An entity can have a quality-range, which is one kind of characteristic, but it does not follow that the entity is a substance. Put differently, on one reading of "substance," the conclusion implies that tropes are particulars in the sense that Broad and Williams specified. This conclusion is not striking at all. Particularity is a primitive categorial fact, indefinable in the theory. But if Armstrong, Heil, and Garcia endorse a more robust theory-laden reading of "substance," they conflate particularity with substance, which is the same old mistake that McTaggart made 100 years ago.

The last counter-objection raises a query about quality-ranges. Are they internal or external (where some entity e is internal iff e supervenes on its relata separately, and e is external iff e is not internal)? Response: quality-ranges (perhaps most) are internal, and if they are internal, they are an ontic free lunch (Armstrong 1997, 12). Thus, it is due to the nature of the redding, and facts about it, that it has the quality-ranges that it has (cf. Keinänen, Keskinen, and Hakkarainen 2019, 525-529). Relatedly, it is probable that quality-ranges involve primitive predication. Fundamental absolute processes primitively have quality-ranges, and there is no further story about why this is so. No theory does away with all primitives. So, it is no strike against the view, if it contains some primitive predication. Indeed, it is inevitable that primitive predication

is encountered when characterizing the fundamental entities of one's ontology.

The debate does not end here. Foes of trope theory may argue that tropes--even if understood as abstract occurrents--exhibit property-like behavior. So, if the project is to explain the nature of properties and entities (NB: not things) having properties, then occurrents having characteristics fails to achieve this explanatory goal. But this is too quick. We need to get clear on what exactly the explanatory aims are. One agreed-upon aim is to explain how many <u>things</u> share a property because we are trying to explain <u>Moorean</u> facts about resemblance among things in intrinsic respects. The jump to explaining <u>every</u> fact about <u>any</u> kind of entity having a property must be argued for. Such an aim may be so demanding that no theory can reasonably meet it. Further discussion must be left for another occasion. Nonetheless, it has been fruitful to investigate how Broad's view on processes contributes to this ongoing discussion in contemporary metaphysics.

6 Conclusion

This paper gave a comprehensive exposition of Broad's ontology of absolute processes. On this view, at the fundamental level, there are only absolute processes. Absolute processes ground things as well as processes qua states of things. Broad's concept of a quality-range opens up the prospect of reconceiving how processes have characteristics (and subsequently how tropes have features such as shape, size, and duration). It was argued that Broad's metaphysics is incomplete and that Williams's metaphysics of tropes can fill out the theory whereby absolute processes are tropes and conversely that tropes are abstract occurrents. It was shown that a Broad-style trope theory of processes can respond to a persistent family of objections against one-category trope ontology in the contemporary metaphysics literature. Lastly, this paper has brought to light an overlooked but attractive theory of processes by an important figure in the history of analytic philosophy.[6]

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[1] For discussion on the historical origins of Broad's growing block theory of time, see (Thomas 2019). For a detailed account of Broad's ontology of time, see (Oaklander 2020). Ontological issues about time are bracketed. This paper is concerned with concepts of process and event, which fall under the category of temporality but do not directly impinge upon the existence of times.

[2] Nicholas Rescher argues that there are processes not owned by a substance or thing; these processes are self-subsistent, subjectless processes (Rescher 1996, 44-46). His examples include: forces, fields, the world's entropy, the northern lights, and conceptual artifacts: words, letters, songs, plays, and poems.

[3] Whether there is a distinction between sensibilia and aspects of objects in the external world depends on one's theory of perception. If direct realism is true, there is no such distinction; so, in explaining auditory and visual sensibilia we are already accounting for nonmental items. This paper remains neutral about theories of perception.

[4] Broad hesitates to say this is a clear case of hearing a moving sound because he thinks it might not be a totally auditory experience. Perhaps, some belief is involved such that I believe (or infer) that the car moves (not the sound) based in part on auditory experiences. At any rate, he accepts the possibility of auditory movement and explains it in terms of a place-range.

[5] Another way out of this problem is to remind our opponent that tropes are neither objects nor properties, fundamentally speaking. The object/property distinction is derived from the notion of a trope (Forrest 1993, 47). Tropes are described in fundamental terms as abstract or thin particular natures. Nonetheless, trope theorists need to fill out the underlying story about tropes as natures. Broad's account is one plausible way of doing this.

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