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Mere Cambridge Properties

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## MERE CAMBRIDGE PROPERTIES

Robert Francescotti

The “Cambridge criterion” provides a refreshingly simple account of what it takes for an object to undergo change. An object  $x$  has undergone a change, according to the Cambridge criterion, just in case for some property  $F$  and times  $t_1$  and  $t_2$ , it is true (false) that  $Fx$  at  $t_1$ , but false (true) that  $Fx$  at  $t_2$ . Simply put, something has changed just in case it has lost (gained) some property. However, as Geach (1969) notes, the correct account of change cannot be quite that simple. He has us consider the change that Socrates undergoes when he becomes shorter than Theaetetus simply by virtue of the latter’s growth (p. 72). Socrates acquires a new property (the property of being shorter than Theaetetus). So, according to the Cambridge criterion, Socrates changes. However, the change that occurs does not seem to be a genuine change in Socrates; Theaetetus is the real object of change. Likewise, when Socrates comes to be admired by a new schoolboy, it seems that only the schoolboy is the object of genuine change.

Counter-examples to the Cambridge criterion are easy to find. Consider the odd properties, being fifty miles east of a burning barn, being situated halfway between a large oak tree and a small pine, and being over one hundred miles from the current heavyweight champion of the

world.<sup>1</sup> There is a strong intuition that, in some sense, these are not *genuine* features of the individuals that have them. Instead, these properties and the change one undergoes by acquiring or losing them seem nothing more than *mere* Cambridge.

But what do we mean when we say that the properties are not genuine? We do not mean that they fail to exist; nor do we mean that individuals never exemplify them. There is, after all, such a thing as being halfway between a large oak and a small pine, and this spatial feature is one that an individual might truly have. So why call such properties *mere* Cambridge? The goal here is to isolate what exactly we find odd about the properties mentioned. That will tell us how to define mere Cambridge properties (C-properties, for short). We can then define a mere Cambridge change as one that consists in the loss or acquisition of C-properties.

Let us begin by evaluating some causal accounts of C-properties. The problems we detect show how to develop a more successful analysis in sections II–IV.

### I. MAKING NO CAUSAL DIFFERENCE

Miller (1982) suggests that

the properties corresponding to the predicates “—is famous,” “—is shorter than his

brother,” and “— is temporally prior to his nephew” are clearly not real but Cambridge, since even when these are true of X, his having the corresponding properties may not make the slightest difference to him. (p. 185)

Since Jill might become famous solely by virtue of changes in others, her becoming famous does not require that she change any of her own features. In that sense, her becoming famous may not make the slightest difference to her. On the other hand, Miller notes, “it does make a difference to X that he have the properties corresponding to the predicables ‘— is deluded,’ ‘— loves Hitler,’ ‘— is intelligent,’ or ‘— is melted’” (p. 186). Loving Hitler, for example, makes a great difference since acquiring this property entails drastic changes in one’s psychology.

However, Miller is also aware that we cannot *define* C-properties as those that make no difference, since any C-property will make some type of difference—if nothing else, it makes the difference between having and lacking that property.<sup>2</sup> So what we need is a non-circular way to explain the important sense in which C-properties make no difference to the objects that have them.

One might insist, with Shoemaker (e.g., 1980 and 1988), that a change is not genuine if it in no way affects the *causal powers* of the object that changes, for only genuine changes, it might be thought, involve the loss or acquisition of causally efficacious properties. For example, since Theaetetus’s growth makes a difference to his causal powers, his growth qualifies as a genuine change in him. However, Socrates’ being such that Theaetetus has grown in no way affects the causal powers of Socrates; so being such that Theaetetus has grown is a C-property of Socrates. Now, it seems that a property F could affect the causal powers of an object x only if x’s having F might qualify as the cause

of some event. So, as a first attempt, one might offer the following analysis:

- (1) F is a C-property of an item x =<sub>df</sub> x has F, and it is nomologically necessary that for any event e, x’s having F is not a cause of e.<sup>3</sup>

An immediate objection to (1), or any other causal analysis, is that the distinction between genuine properties and C-properties applies to *abstract* as well as concrete particulars. To borrow an example from Geach (1969, p. 72), being the number of somebody’s children is obviously a C-property of the number five, whereas being identical with the number five is a genuine feature of the number. However, since the number five arguably lacks causal powers, it is unclear how being identical with five makes any more of a causal difference to the number than being the number of somebody’s children. Even if it could be shown that mathematical objects have some type of causal features, an analysis of C-properties should not *imply* that they do. It seems doubtful, then, that a causal analysis could provide sufficient conditions for being a C-property.

Suppose we restrict our causal analysis to those features had by *concrete* objects.<sup>4</sup> It is arguable that where concrete objects are concerned, lack of causal efficacy is sufficient for being a C-property. But even if this is correct, there is still another worry. Is lack of causal efficacy *necessary* for being a C-property? Suppose a pilot notices a burning barn, a little while later notices Jack, calculates the distance between Jack and the barn, and forms the belief that Jack is fifty miles east of a burning barn. In this case, the pilot’s belief is caused, at least in part, by Jack’s being located fifty miles east of a burning barn. So definition (1) gives the implausible result that being fifty miles east of a burning barn is a genuine property of Jack.

Shoemaker (1980) acknowledges that C-properties can be causally efficacious, but notes that when verifying one's position with respect to a burning barn, "it will be primarily the causal powers of the barn, and the intervening stretch of land (which, we will suppose, I measure) rather than the causal powers of the man, that will be responsible for my verifying observations" (p. 123). It is not immediately obvious how Jack's causal powers are any less operative than those of the barn or the intervening stretch of land. Perhaps the idea is that the burning of the barn and the vast expanse of land are much more noticeable than the presence of Jack, and therefore more salient factors in the production of the pilot's visual representations. If so, then while Jack's features are partial causes of the pilot's belief, they are not among the *primary* causes. So we should weaken (1) to read:

- (2) F is a C-property of an item  $x =_{df} x$  has F, and it is nomologically necessary that for any event e, x's having F is not a *primary* cause of e.

The notion of a *primary* cause will need to be made precise, but even a rough understanding is enough to show that (2) also fails. Suppose that Jack displays a vast array of fireworks (far more noticeable than any other feature on land) in order to alert potential pilots. When a pilot lands, Jack tells her to fly fifty miles west and observe. She flies west, notices the burning barn, calculates the distance, and infers that Jack is fifty miles to the east. In this case, it seems that Jack's causal powers are just as operative as those of the barn and the intervening stretch of land.

It might be suggested that even in this case Jack's being fifty miles east of a burning barn is not *itself* a cause of the pilot's belief, since the pilot never *directly* observes the distance between Jack and the

barn. First she observes Jack, a little while later observes the barn, and then calculates the distance between the two. So the causes include Jack's activity, the presence of the barn, and her calculations regarding the distance between; they do not include Jack's being fifty miles east of the barn. However, we can easily modify the scenario so that it more clearly refutes (2). The property of being *half a mile* east of a burning barn is just as merely Cambridge as the property of being fifty miles east. So let us suppose that Jack is only half a mile away, separated from the barn by a flat stretch of land. Let us also assume that the pilot is flying at just the right height to clearly observe both Jack and the barn at the very same time. Given her expertise at judging distance, the visual representation of Jack's position with respect to the barn causes her to immediately form the belief that Jack is half a mile to the east. In this case, the property of being half a mile east of a burning barn is clearly a cause, and a primary cause, of the pilot's belief.

So we must allow that C-properties are not only causally efficacious, but might even play a primary causal role. How can we do this and still endorse a causal analysis? The fan of causal analyses might find refuge in Cleland's (1990) claim that "*operative tendencies to be elsewhere* are indispensable for physical theory and explanation" (p. 271, emphasis added). Cleland reminds us of Newton's rotating globes thought-experiment. Two globes are connected by a string, and revolve around their common center of gravity against a background of bodies that maintain a fixed position with respect to one another. We want to say that the globes are really moving, even though their position with respect to each other and the surrounding bodies remains constant. Suppose we thought that motion was simply occupying different

places at different times. Unless we also believe in absolute spatial location, it is hard to explain the fact that the globes are moving, given their fixed relative position. Although Newton did believe in absolute space, he also claimed, notes Cleland (pp. 269–270), that we have strong empirical evidence that the globes are in motion. If the globes were not moving, there would be no *tension* on the string, and this tension, Newton thought, indicates an “endeavoring” on the part of the globes. Cleland uses the expression, “operative tendency to be elsewhere,” to distinguish the active inclination had by the globes from a merely latent (or purely dispositional) tendency. The *operative* tendency is what makes it true to say that the globes are really moving. In general, “the difference between real motion and *mere* Cambridge motion is operative tendencies to be elsewhere” (p. 273). Although Cleland’s discussion is primarily concerned with motion, she wishes to extend her analysis to change in general. She notes, for example, the change that occurred to her mother when she outgrew her. The change in her mother did not consist in any operative tendency to be elsewhere, for unlike the daughter, the mother was not “passing from one discrete value of height to another.” (p. 279). This lack of an operative tendency is what makes the mother’s change mere Cambridge.<sup>5</sup>

Cleland’s appeal to operative tendencies is one way of expressing the intuition that when an object undergoes a genuine change, the change consists in a causally efficacious process that occurs within the object. Becoming shorter than another individual simply by virtue of the other’s growth does not require any change in inner causal processes, for one’s inner processes might have remained exactly the same even if one were not outgrown by

another. But *growing* taller than another individual does consist in an inner causal process, which is why becoming taller than Socrates is a genuine property of Theaetetus. Thus, Cleland’s discussion inspires the following analysis:

- (3) F is a genuine property of an item  $x =_{df} x$  has F, and there is an inner causal process  $p$  such that  $x$ ’s having F is the same process as  $p$ .

We would need to clarify the notion of an “inner causal process,” but perhaps we can do so in a way that allows events to cause without being inner causal processes. If so, we can allow that some C-properties (e.g., being fifty miles east of a burning barn) are causally efficacious, and thereby avoid the objections to (1) and (2).

However, it seems that the real insight of (3) is not the emphasis on processes or causal powers, but the emphasis on *internality*. Growing in height is a causally efficacious feature, but it seems that what makes it a genuine feature of an individual is the mere fact that it is, in some sense, “internal” to that individual—unlike being fifty miles east of a burning barn. The fact that it is internal is what inclines us to say that the former property, unlike the latter, makes a difference to the individual herself. The fact that growth is a *process* also seems irrelevant. To say that one has undergone an internal change implies that a process has occurred within the individual, but the fact that a process has occurred is not what makes the property (lost or acquired during the change) genuine. For even where concrete objects are concerned, there are properties with respect to which change does not occur, but that we still wish to classify as genuine. Being a vertebrate is a genuine feature of Jill, but Jill’s being a vertebrate is not a property with respect to which she undergoes change. Being a vertebrate, it seems, is a genuine

feature of Jill simply because it is an internal feature of her.<sup>6,7</sup>

So perhaps we should simply eliminate talk of causes and processes and say that the C-properties of an individual are those that are not internal to that individual. But now the task is to explain the sense in which C-properties are not internal.

## II. MAKING NO INTERNAL DIFFERENCE

“It might be suggested,” Schlesinger (1990) notes, “that the C-properties of a particular X are those that do not manifest themselves in any way within the region occupied by X” (p. 534). This is one way to understand the claim that C-properties are not internal, and a very plausible one. However, we would like a different characterization, one that does not refer to regions of space (so that we can distinguish between the internal and external features of abstract as well as concrete objects). A related point is that we must ensure that there is no implicit reference to occurrences (so that we may correctly classify properties with respect to which change does not occur).<sup>8</sup>

Perhaps we should understand the internal/external distinction in terms of *relationality*. Being the number of somebody’s children is not a property we would call internal to the number five, for the number has this property by virtue of how it relates to other items (i.e., the children). Being identical with the number five, on the other hand, is internal, since it is a feature that the number has non-relationally—that is, by virtue of what it is like in itself. So one might suggest that genuine properties are internal since they are non-relational, whereas C-properties are external because they are relational.

This suggestion, I believe, is on the right track; however, there are two immediate problems. (i) A property that qualifies as internal might consist in a relation that an

object bears to itself or its proper parts. Jack bears the heavier-than relation to all of his proper parts, and the number five bears the relation of identity to itself. But being heavier than all of one’s proper parts and being self-identical both seem to qualify as internal features. Also (ii) a property can be a genuine feature of an individual without being *wholly* internal to that individual. Growing taller than Socrates is a genuine feature of Theaetetus, since he has it partly by virtue of a change in his own height. But it is not wholly internal to Theaetetus, since his having this property depends on how his height compares with that of Socrates.

One easy way to avoid problem (ii) is to characterize genuine properties as *at least partly* internal and C-properties as *not even partly* internal. The hard task is to then explain what it is for a property to be at least partly internal. I save this task for section IV.<sup>9</sup> Regarding (i), we can allow that some internal properties are relational by isolating a special type of relational property, and then defining internal properties as those that are not of that special type.<sup>10</sup>

## III. INTERNAL PROPERTIES DEFINED

Khamara (1988) characterizes relational properties as those “which individuals have in virtue of their relations to other individuals” (p. 144), and he divides these properties into two main categories. Being a pupil of Plato is an *impure* relational property, Khamara notes, “for it consists in the having of a relation (being a pupil of) to one particular individual, namely Plato” (p. 145). Being a pupil of *some* individual is a *pure* relational property, since it “is a property which consists in the having of a certain relation, not to one particular individual, but to some one or other of a group of individuals” (p. 145).

The difference between the two lies in the placement of the existential quantifier “some individual”; if

- (a) there is a relation  $R$ , and an item  $y$ , such that  $x$ 's having  $F$  consists in  $x$ 's bearing  $R$  to  $y$ —i.e.,  $(\exists R)(\exists y)(Fx = Rxy)$ ,

then  $F$  is an *impure* relational property of  $x$ , but if

- (b) there is a relation  $R$ , such that  $x$ 's having  $F$  consists in there being some item  $y$  (of some antecedently specified class—e.g., the class of individuals, musicians, or philosophers) to which  $x$  bears  $R$ — $(\exists R)[Fx = (\exists y)Rxy]$ ,

then  $F$  is a *pure* relational property of  $x$ .<sup>11</sup>

Humberstone (1996, p. 212) reminds us that an *existential* relational property has a *universal* counterpart; one can be larger than some musician or one can be larger than every musician. In general,  $F$  is a *universal relational* property of an item  $x$  if

- (c) there is a relation  $R$ , such that  $x$ 's having  $F$  consists in  $x$ 's bearing  $R$  to every item (of some antecedently specified class)— $(\exists R)[Fx = (\forall y)Rxy]$ .<sup>12</sup>

There are also *negative* relational properties to consider. Sitting next to Jill is a positive impure relational property. The negative counterpart is, not sitting next to Jill. Sitting next to some individual or other is a positive pure relational property whose negative counterpart is, not sitting next to some individual or other (i.e., there being some individual or other next to which one is not sitting). A universal relational property (e.g., is taller than every musician) also has a negative counterpart (is not taller than any musician).

However, we need not view negative properties as forming a distinct class of relational features, for each can be construed as positive. Suppose that Jack is not sitting next to Jill. Then there is a relation  $R$  (the *not-sitting-next-to* relation), and an individual  $y$  (Jill), such that Jack bears  $R$

to  $y$ . Suppose that Jack is not sitting next to some philosopher or other—that is, there is some philosopher next to which Jack is not sitting. Then there is a relation  $R$  (again, the *not-sitting-next-to* relation), and Jack's having the negative pure property consists in there being some item belonging to the class of philosophers to which Jack bears  $R$ . Finally, suppose that Jack is not taller than any musician. Then Jack bears the *not-taller-than* relation to every member of the class of musicians.

Other varieties of relational property can also be explained in terms of the three basic forms, (a)–(c). For example, we can replace the universal quantifier in (c) with a “most” quantifier to classify the property, is taller than most musicians. We can easily modify (a)–(c) to describe relations that are more than two-place. Sitting between Socrates and Theaetetus, for example, fits the following modification of form (a): there is a relation  $R$  (the *sitting-between* relation) and individuals  $y$  and  $z$  (Socrates and Theaetetus) such that  $x$ 's having  $F$  consists in  $x$ 's bearing  $R$  to  $y$  and  $z$ . And compound relational properties (e.g., is taller than all musicians and sits between Socrates and Theaetetus) can be expressed in terms of truth-functional operations on properties of forms (a)–(c).

There are many more details about the different varieties of relational property and how they logically interrelate, but enough has been said here to help us define internal properties. As noted earlier, properties that intuitively qualify as internal might consist in relations one bears to oneself or one's proper parts. So to explain the internal/external distinction in terms of relationality, we must first identify a special type of relational property, and then define internal properties as those that are not of that special type. Let us introduce the notion of a *d-relational* property. Suppose that an item  $x$  is *distinct from* an item

y just in case x is not identical with any of y's parts (proper or improper), and call a property "d-relational" just in case one's having that property consists in a relation one bears to a distinct item. Suppose, for example, that Jack is sitting next to Jill. Sitting next to Jill is a d-relational property of Jack provided that Jill is distinct from Jack. In general, F is a (positive) impure d-relational property of an item x just in case

- (a\*) there is a relation R, and an item y, such that (i) x's having F consists in x's bearing R to y, and (ii) *y is distinct from x*.

Being the pupil of some philosopher is a pure d-relational property of Jill provided that the philosopher of which Jill is a pupil is distinct from Jill. If Jill is the pupil of more than one philosopher, then being the pupil of some philosopher is d-relational provided that at least one of those philosophers is distinct from Jill (for in that case Jill has the property at least partly by virtue of how she relates to distinct individuals). In general, F is a (positive, existential) pure d-relational property of an item x just in case

- (b\*) there is a relation R, such that (i) x's having F consists in there being some item (of some specified class C) to which x bears R, and (ii) at least one item (belonging to C) to which x bears R is distinct from x.

We should also add the d-relational analogue of (c). Suppose that Jill is sitting next to every musician. Then sitting next to every musician is a d-relational feature of Jill provided that at least one musician is distinct from Jill. So F is a (positive) universal d-relational property of an item x just in case

- (c\*) there is a relation R, such that (i) x's having F consists in x's bearing R to every item (of some specified class C), and (ii) at least one item (belonging to C) is distinct from x.<sup>13, 14</sup>

Any property that satisfies (a\*), (b\*), or (c\*) has a negative counterpart. However, as with negative relations generally, negative d-relations can be construed as positive. Suppose that Jack is not sitting next to Jill and Jill is distinct from Jack. Then not sitting next to Jill qualifies as a negative d-relational feature of Jack. But there is a relation R (the not-sitting-next-to relation) and an individual y (Jill), such that Jack's not sitting next to Jill consists in Jack's bearing R to y. So, given that Jill is distinct from Jack, not sitting next to Jill also qualifies as a positive d-relational feature (type a\*) of Jack.

Having specified the basic categories of d-relational properties, we can now define an internal property as one that is not d-relational.

- (4) F is an internal property of an item x =<sub>df</sub> x has F, and F is not a d-relational property of x.

(4) allows that some internal properties are relational. Being the same height as Jill is an existential, impure relational property of Jill herself. However, it is not d-relational, since the individual to which she bears the same-height-as relation is not distinct from her. Being heavier than all of his proper parts is a universal relational property of Jack, but it is not d-relational, since none of those proper parts is distinct from him. Since neither property is d-relational, both are internal.

In section II, we suggested that the difference between genuine properties and C-properties could be understood in terms of the internal/external distinction. With definition (4), we can better see how this might be done.

#### IV. C-PROPERTIES DEFINED

Suppose we simply define C-properties as those that are not internal—i.e.,



- (5) F is a C-property of an item  $x =_{df}$   $x$  has F, and F is not an internal property of  $x$ .

This definition improves upon causal analyses by allowing that C-properties are sometimes causally efficacious. Being located fifty miles east of a burning barn might have a causal impact (on an observer's perception and beliefs), but since the property is d-relational (type b\*), it is not internal. With (5) we can also distinguish between the genuine and odd properties of abstract particulars. Being the number of somebody's children is a C-property of the number five, since its having this property consists in a relation it bears to distinct individuals. But being identical with the number five is an internal feature of the number, for though it is relational it is not d-relational; the item to which five bears the identity relation is not distinct from five. So being identical with five is a genuine feature of the number.

But recall the second problem mentioned at the end of section II. A property can be a genuine feature of an individual without being *wholly* internal to that individual. Outgrowing Socrates is a genuine property of Theaetetus, for he has this property partly by virtue of a change in his own height. But the property is not wholly internal to him, since his having this property depends on how his height compares with that of Socrates. What we should say in this case is that outgrowing Socrates is a genuine feature of Theaetetus because it is *at least partly* internal to him. C-properties, on the other hand, are wholly external to the individuals that have them.

To capture the sense in which C-properties are wholly external, I suggest that we modify (5) to read:

- (6) F is a C-property of an item  $x =_{df}$   $x$  has F, and for any properties  $G_1, \dots$ , and  $G_n$ , such that  $x$ 's having F consists in  $x$ 's having  $G_1, \dots$ , and  $G_n$ , neither  $G_1, \dots$ , nor  $G_n$  is an internal property of  $x$ .

And let us interpret "consists in" as follows:  $x$ 's having F (at time  $t$ ) consists in  $x$ 's having G (at  $t$ ) just in case they are the very same property-instance (i.e., the very same event or state).<sup>15</sup> When Socrates is outgrown by Theaetetus, he also exemplifies many internal properties. But being outgrown by Theaetetus is a C-property of Socrates since his having this property is not to be identified, even in part, with the having of any internal properties. On the other hand, outgrowing Socrates is a genuine property of Theaetetus because Theaetetus has this property by virtue of (i) growing and (ii) becoming taller than Socrates. Since (ii) is a d-relational property (type a\*), it is not internal. But (i) is internal, and according to (6) that is enough to make the property of outgrowing Socrates a genuine feature of Theaetetus.

If the externalist (regarding mental content) is correct, then the content of our thoughts is not wholly internal to us. Whether one is thinking about water instead of twater (i.e., what is called "water" on twin-earth) depends on whether one is suitably causally related to liquid comprised of  $H_2O$  or liquid comprised of XYZ. But having a water-thought seems to be a genuine feature, since having the thought has partly to do with what one is like internally; it requires that one have whatever internal features constitute the narrow content of the thought. Thus, for any individual  $x$  that has a water-thought, there is an internal property I, such that  $x$ 's having I is part of what constitutes  $x$ 's having the water-thought. So the thought is not a C-property according to (6).

It may already be apparent that d-relations nicely explain how the notion of a C-property relates to the *intrinsic/extrinsic* distinction. "A thing has its intrinsic properties," Lewis notes, "in virtue of the way the thing itself, and nothing else is" (1983, p. 197). So a plausible criterion for

a property's being intrinsic is whether one has that property by virtue of being related to distinct items. Thus, what (4) defines as internal (namely, properties that are not d-relational) comes very close to what we mean by "intrinsic." A liver is not distinct from the body that contains it; so one's having a liver is not *d*-relational, and that is why having a liver is considered intrinsic. Sitting next to a musician, on the other hand, is not intrinsic, since having this property consists in a relation that one bears to a distinct individual.

Extrinsic properties are those that are not intrinsic, but not all of them are C-properties; the extrinsic properties that are genuine include growing taller than Socrates and having a water-thought. Intuitively, the reason that some extrinsic properties are genuine is that a property might have *something but not everything* to do with the object that has it. We can express this idea by saying that some extrinsic properties are partly, though not wholly, d-relational. C-properties are those extrinsic features furthest removed from the intrinsic; they have nothing to do with the objects that have them, meaning, they are entirely d-relational (i.e., they do not consist even partly in the presence of an internal property).<sup>16</sup>

Like all of the earlier definitions, (6) is relativized to individuals. Rather than saying what it is for F to be a C-property *simpliciter*, (6) tells us what it is for F to be a C-property of a particular individual. This is important, since a C-property of one individual might be a genuine property of another. The property of being such that Jill is wise, for example, is a C-property of Jack (assuming that Jill is distinct from Jack), but it is a genuine feature of Jill. If the analysis offered here is correct, we can explain why a C-property of one individual might be a genuine property of another. We are defining C-properties in terms of the

internal/external distinction, which in turn is understood in terms of d-relations. But whether a property is d-relational depends on the individual that has it (e.g., being such that Jill is wise is a d-relational feature of Jack but not of Jill). So the relativity of C-properties is merely a symptom of the relativity of d-relations.<sup>17</sup>

Mere Cambridge changes (C-changes) are ones that consist in the loss or acquisition of nothing other than C-properties. That is,

- (7) *y* is a C-change for an item *x* =<sub>df</sub> there are properties  $F_1, \dots, F_n$  such that *x*'s undergoing *y* consists in *x*'s losing (acquiring)  $F_1, \dots, F_n$ , and each of  $F_1, \dots, F_n$  is a C-property of *x*.

We explained why being outgrown by Theaetetus is a C-property of Socrates. His acquiring this C-property constitutes the change he undergoes when he becomes shorter than Theaetetus, and that is why the change Socrates undergoes is a C-change. But suppose that Socrates becomes shorter than Theaetetus, not because Theaetetus grows taller, but because Socrates shrinks in height. Then there are internal events (those that constitute Socrates' shrinking) such that Socrates becomes shorter than Theaetetus partly by virtue of those internal events. So, in this case, becoming shorter than Theaetetus is a genuine change in Socrates.

Or suppose that Jill is no longer thinking about water. This might occur in either of two ways. Jill might lose the water-thought because of certain internal changes (a change in whatever inner events causally underlie the thought), or she might lose the thought because she is switched to twin-earth. In the former case, her losing the thought constitutes a genuine change, since it is a change in internal properties. In the latter case, the loss is a C-change, since she loses the thought solely by virtue of a change in a C-property.

## V. CONCLUDING REMARKS

Along with being fifty miles east of a burning barn and being halfway between a large oak and a small pine, Shoemaker (1988) includes in his list of “fishy” properties, the property of being grue (green and examined before 2000 A.D. or blue and not so examined) and being a klable (having the midnight till noon stages of a kitchen table together with the noon till midnight stages of a living room table). Though fishy indeed, there is an important difference between being grue or being a klable and the properties mentioned earlier. Whether an object is grue depends at least partly on its inner features—i.e., the light reflectance capacities of its surface over time.<sup>18</sup> And something has the temporal stages of a table only if those stages bear the right sort of structural design. So, according to definition (6), being grue and being a klable are not mere Cambridge

So what do we find fishy about grueness and klablehood? The main problem seems to be that even if these properties really exist, they are, as Shoemaker notes, highly ill-suited for causal explanation (scientific or ordinary). The fact that they are ill-suited for causal explanation might be explained in terms of projectibility, but whatever the reason, it is not a reason that explains what we find odd about being fifty miles east of a burning barn or being halfway between an oak and a pine. As noted in section I, paradigmatic C-properties such as these can causally influence and they can do so in an explanatory way; recall how we explained the pilot’s perceptions and beliefs. Granted, in certain contexts, C-properties seem causally irrelevant, but if the analysis offered here is correct, these are cases in which we seek an explanation for an object’s having a certain feature *in terms of the object’s internal*

*properties*. For example, if we wonder about the neurological cause of Jack’s pyromania, his relation to a burning barn is entirely irrelevant. However, if Jack is on trial for the burning of a barn, noting his spatial relation to the barn might be highly relevant. Assuming that the fire had just begun when it was detected, the fact that he was fifty miles east at the time would casually explain why he could not have committed the crime. Thus, unlike grueness or being a klable, being ill-suited for causal explanation is not what makes C-properties fishy. What we find odd about C-properties is that they have nothing to do with the objects that have them, and if the analysis offered here is correct, this means that they are had solely by virtue of non-internal (d-relational) properties, which would explain why, in certain contexts, they are ill-suited for casual explanation.

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## NOTES

1. These examples are taken from Kim (1973, p. 231), Schlesinger (1990, p. 534), and Shoemaker (1980, p. 110), respectively.
2. As Schlesinger (1990, p. 534) puts it, “it does make a difference to X whether . . . he does or does not exemplify the property of being temporally prior to his nephew, for that determines whether or not X must have had either a sibling or been married, whether or not he is an uncle whose nephew succeeds him temporally, and simply, whether or not he has or lacks the property of being temporally prior to his nephew.”
3. Definition (1) emphasizes nomological rather than logical necessity. This restriction is crucial to any causal analysis, for whether a change in properties affects one’s causal powers depends on the causal laws obtaining at the world one inhabits. A property that makes no difference to one’s causal powers at the actual world might make a great difference at a world with different causal laws. So if we define a C-property as one that is causally inefficacious at all logically possible worlds, we risk making virtually any property genuine. (More precisely, we risk making virtually any property genuine assuming that causal laws do not obtain as a matter of logical necessity. However, one might argue [especially if one individuates properties causally] that the laws obtaining at the actual world obtain at all logically possible worlds. If such a view is correct, then the “restriction” to nomological possibility in formulation [1] would not count as any real restriction after all. [See Shoemaker {1980, sec. 8} for a defense of the view that all logically possible worlds are nomologically possible.]
4. For example, regarding his account of property identity and genuineness, Shoemaker (1980) says “I should mention that I am concerned here only with the sorts of properties with respect to which change is possible; my account is not intended to apply to such properties of numbers as being even and being prime” (p. 112). And Mellor (1991) restricts his account of property identity to “contingent properties of so-called ‘concrete’ particulars” (p. 256). Note that there is a restriction to concrete particulars and a restriction to contingent properties. Abstract particulars are a problem because their causal powers are in question; we shall soon see why necessary features might be problematic.
5. An especially interesting feature of Cleland’s paper is that she uses her account of change to try to solve Zeno’s bisection paradox and the paradox of the arrow.
6. Of course, the concern about properties that do not change is even greater when mathematical objects are considered, for as Kremer (1997) notes, “[w]e might wish to distinguish between the real and hokey properties of the number 5 or the set  $\phi$ , even when the hokey properties are themselves expressed in an atemporal mathematical vocabulary” (p. 44). (We should note that Kremer provides his own account of C-properties by appealing to Dunn’s work [e.g., 1987 and 1990] on relevant predication. But the discussion of relevant predication and Kremer’s use of it is far too involved for a brief review.)
7. One might focus only on *contingent* features (recall note 4). But this does not avoid the problem completely, since there are genuine features of concrete objects with respect to which an individual could, but does not, change. Being less than six feet tall is a genuine feature of me, but even though it is a feature I will never lose, I assume it is not one that I have essentially.
8. Schlesinger offers two possible ways of explicating his initial proposal. He suggests that if F is a C-property of an object x in a certain region of space, then “even a perfect observer whose observations are confined to that region only, would be unable to determine whether X does or does not exemplify F” (p. 535). There is still the reference to regions of space, and there are potential problems concerning features (of even concrete objects) that are nomologically imperceptible.

His other explication avoids these difficulties, but circularity threatens. To determine whether something has undergone a mere Cambridge change during period  $t_0$ – $t_1$ , one might suggest the following test. “Consider a possible universe  $U$  which differs in no respect from the actual universe except that in  $U$  the temporal slices,  $X$ -at- $t_0$  and  $X$ -at- $t_1$ , of an actual particular  $X$  were interchanged” (1990, p. 535). If the resulting universe were to remain exactly the same, expect for the interchange of  $x$ -at- $t_0$  and  $x$ -at- $t_1$ , then (the suggestion goes)  $x$  underwent a mere Cambridge change during  $t_0$ – $t_1$ . However, suppose that we interchange all of Socrates’ properties at  $t_0$ , including the property, *is taller than Theaetetus*, with all of his properties at  $t_1$ , including the property, *is shorter than Theaetetus*. Now Theaetetus has the property of being outgrown by Socrates during that period. So the resulting universe does not remain the same—unless we mean “exactly the same in terms of genuine properties.”

9. Note that the distinction between being partly internal and being wholly external already seems to figure in Schlesinger’s initial proposal; “the C-properties of a particular  $X$  are those that do not manifest themselves *in any way* in the region of space occupied by  $X$ ” (emphasis added). I take it that part of what is meant by “in any way” is that the events in question lie wholly external to the individual’s region of space.

10. The next section is extracted, with some modification, from a longer discussion of relationality in my “How to Define Intrinsic Properties” (forthcoming in *Nous*).

11. For ease of exposition, I have deleted time-indices. But bear in mind that one might be related to an item that does not *currently* exist. Being a descendent of Jill is a relational property of the individuals who have it, even if Jill has ceased to exist, and being the future aunt of Jack’s first child is also d-relational even though the child has yet to be born. Thus, formulation (a) should read: there is a relation  $R$ , and an item  $y$  at a time  $t^*$ , such that  $x$ ’s having  $F$  at  $t$  consists in  $x$ ’s bearing  $R$  at  $t$  to  $y$  at  $t^*$ . The formulations that follow should be expanded in a similar fashion.

12. How should we understand the *consists-in* relation mentioned in formulations (a)–(c)? One might explain the relation in terms of *logical equivalence*; i.e., having property  $F$  consists in having property  $G$  just in case, necessarily, for any item  $x$ ,  $x$  has  $F$  if and only if  $x$  has  $G$ . However, Khamara (1988, pp. 145–146) warns against this interpretation. He worries about counter-examples such as the following (which he attributes to Tom Karmo). Suppose there is an omniscient God, who exists necessarily. Necessarily, for any object  $x$ , and any property  $F$  such that “ $x$  has  $F$ ” is a true proposition that can be known,  $x$  has  $F$  if and only if  $x$  is known by God to have  $F$ . So if we understand the *consists-in* relation only in terms of logical equivalence, then  $F$  (whatever property that might be) turns out to be (impure) relational. To avoid this problem, let us view the *consists-in* relation, mentioned in (a)–(c), and the formulations that follow, as being nothing less than *identity*; the property instance,  $x$ ’s having  $F$  (at  $t$ ), *consists in* the property-instance,  $x$ ’s having  $G$  (at  $t$ ), just in case they are the very same property-instance. Although one has  $F$  if and only if one is known by God to have  $F$ , one’s having  $F$  does not consist in being known by God to have  $F$ , since they are different property-instances (i.e., different events or states).

13. Like (a)–(c), (a\*)–(c\*) are relativized to individuals. This is especially important for characterizing d-relations because whether a property is d-relational depends on the individual that has it. The property of being the same height as Jill is not a d-relational property of Jill herself, but it is a d-relational feature of Jack (given that Jill is distinct from Jack). Also, when it comes to characterizing d-relations, time indices are important for a reason not mentioned in note 11—i.e., whether a property is a d-relational feature of an individual depends on *when* the individual has that property. Suppose that Jack is educated only by himself for a year and is educated only by Jill for the next year. In this case, being the pupil of someone is a d-relational feature of Jack during the second year, but not during the first. (I borrow this example from an anonymous referee.)

14. One could argue that condition (ii) makes (c\*) too strong. Suppose there are no contingent items distinct from Jill. Then Jill has the property, contains every contingent item (that is, has every contingent item as a part). Although she bears the containing-relation only to her parts, containing every contingent item might still seem d-relational, for to determine whether she contains every contingent item, we would have to consider the world distinct from Jill—in particular, whether it contained any contingent items. On the other hand, we need not consider what the rest of the world is like to determine whether Jill has the property, is heavier than all of one's proper parts, since the description "one's proper parts," by definition, does not apply to any distinct items. So if we wish to allow that containing every contingent item is a d-relational feature of Jill, even when there are no contingent items distinct from Jill, perhaps we should modify (c\*) as follows: there is a relation R, such that (i) x's having F consists in x's bearing R to every item (of some class C), and (ii) *it is logically possible that* at least one item (belonging to C) is distinct from x.
15. Recall note 12. Also, I use the word "state" to include property-instances that do not qualify as *occurrences*—e.g., Jill's being a vertebrate, Toni's being self-identical, and my being less than six feet tall.
16. For more on defining the intrinsic/extrinsic distinction in terms of d-relationality, see Francescotti (forthcoming).
17. Of course, time-indices are also important, since what is C-property of an individual at one time might be a genuine property of the same individual at a different time. The reason is that what is a d-relational feature of an individual at one time might be a non-d-relational feature of the same individual at a different time (as mentioned in note 13).
18. I say "at least partly" to allow that the color of an object is also a function of the sensations produced in normal perceivers.

## BIBLIOGRAPHY

- Cleland, C. E. (1990). "The Difference Between Real Change and *Mere* Cambridge Change." *Philosophical Studies* 60: 257–280.
- Dunn, J. M. (1987). "Relevant Predication 1: The Formal Theory." *Journal of Philosophical Logic* 16: 347–381.
- Dunn, J. M. (1990). "Relevant Predication 2: Intrinsic Properties and Internal Relations." *Philosophical Studies* 60: 177–206.
- Francescotti, R. M. (forthcoming). "How To Define Intrinsic Properties." *Nous*.
- Geach, P. (1969). *God and Soul*. London: Routledge and Kegan Paul.
- Humberstone, I. L. (1996). "Intrinsic/Extrinsic." *Synthese* 108: 205–267.
- Khamara, E. J. (1988). "Indiscernibles and the Absolute Theory of Space and Time." *Studia Leibnitiana* 20: 140–159.
- Kim, J. (1973). "Causation, Nomic Subsumption, and the Concept of Event." *Journal of Philosophy* 70: 217–236.
- Kremer, P. (1997). "Dunn's Relevant Predication, Real Properties and Identity." *Erkenntnis* 47: 37–65.
- Lewis, D. (1983). "Extrinsic Properties." *Philosophical Studies* 44: 197–200.
- Mellor, D. H. (1991). "Properties and Predicates." In *Matters of Metaphysics*, ed. D. H. Mellor. Cambridge: Cambridge University Press, pp. 170–182.
- Miller, B. (1982). "Negative Existential Propositions." *Analysis* 42: 181–188.

Shoemaker, S. (1980). "Causality and Properties." In *Time and Cause*, ed. P. van Inwagen. Dordrecht: D. Reidel, pp. 109–135.

Shoemaker, S. (1988). "On What There Are." *Philosophical Topics* 16: 201–223.

Schlesinger, G. N. (1990). "Qualitative Identity and Uniformity." *Nous* 24: 529–541.