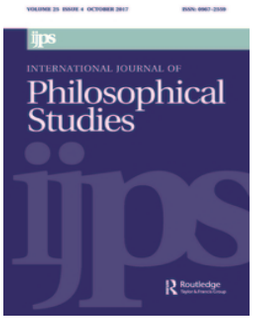

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Gluons of Different Colors

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Many bricks, when configured appropriately, constitute one house. How is it possible for plurality to yield unity? This is the metaphysical problem of unity. Introducing another thing, say, the configuration of the bricks, into the picture would not solve it, for the bricks plus the configuration are still plurality. This is the famous Bradley's regress, as applied to the problem of unity. Something must unify the bricks, but it cannot be any additional thing on pain of Bradley's regress. Therefore, Graham Priest (2014) infers, the metaphysical glue – called 'gluon' by Priest – that unifies the bricks must be one of the bricks. I would like to offer a modest critique of Priest's gluon theory.

Let us say that three parts, a, b, and c, constitute one whole, h. Since a, b, and c are on a metaphysical par with one another, what accounts for the unity of h on Priest's account is a gluon – call it 'g_p' – such that $g_p = a$, $g_p = b$, and $g_p = c$. At the same time, $a \neq b$, $b \neq c$, and $c \neq a$. So, g_p destroys the status of identity as an equivalence relation. Furthermore, g_p turns out to be quite non-standard in other ways; it is identical with itself and is not identical with itself, and it is an object and is not an object. Indeed, g_p is so radical a being that it forces us to abandon classical logic in favor of dialetheism and paraconsistent logic. Priest emphasizes the paradoxical nature of gluons repeatedly. Any interesting objection against Priest's theory of gluons must go beyond merely pointing out the paradoxical gluon traits.

I propose to consider an alternative gluon theory. Call the kind of gluon the alternative theory postulates 'g_y'. I claim that the g_y theory is preferable to the g_p theory because: (1) it does not require dialetheism or paraconsistent logic (I simply assume without argument that on reasonably neutral ground, it is preferable to stay within classical logic if at all possible); (2) it successfully solves the problem of unity if the g_p theory does; and (3) it gives a better account of generation and corruption.

The g_y theory refrains from postulating g_y as anything other than a, b, and c to account for the unity of h. But instead of identifying g_y with each of a, b, and c separately, it identifies g_y with a, b, and c together; g_y is such that a, b, and c are identical with it. Here 'are identical with' is to be understood as plural predication. Suppose that Al, Bob, and Chad collaborate and lift a grand piano together. Here 'lift a grand piano' is plural predication. It is predication of piano-lifting of the three men, and not predication of piano-lifting of any

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single being. In a parallel manner, a, b, and c (plurally) constitute h, and a, b, and c (plurally) are identical with g_y.

If Al, Bob, and Chad lift the piano, then it follows that the piano is lifted by Al, Bob, and Chad. Likewise, if a, b, and c are identical with g_y, then g_y is identical with a, b, and c.[1] Thus, even when predicated in the sense of plural predication, identity is symmetric. Also, since the g_y theory does not identify g_y with something (e.g. a), while also identifying it with some other thing (e.g. b), as the g_p theory does, the g_y theory does not give us any reason to doubt the transitivity of identity. As for the reflexivity of identity, it is clear that the g_y theory respects it. Thus, the g_y theory preserves the classical view that identity is an equivalence relation.

Note that the identity of a, b, and c with g_y is not the trivial identity of a, b, and c with themselves. Even though a, b, and c are identical with g_y when constituting h, they are not identical with g_y when lying around on the ground haphazardly any more than the three men are lifting the piano when scattered around town, minding their own respective business. We may notice that this makes the identity of g_y not supervene on the intrinsic features of a, b, and c. This aspect of the g_y theory stems directly from the nature of a gluon theory in general and cannot be helped; the g_p theory exhibits the same lack of supervenience, too. Remember that my claim is not that the g_y theory is acceptable, but rather that the g_y theory is more acceptable than the g_p theory.

Here is a list of some formal principles governing the g_y theory ('$\vDash$'expresses the entailment relation):

(1) $a, b, c = g_y \vDash g_y = a, b, c$ and $a, c, b = g_y$ and $b, a, c = g_y$ and $b, c, a = g_y$ and $c, a, b = g_y$ and $c, b, a = g_y$.
(2) $a, b, c = g_y \nvDash a, b, c, d = g_y$ (where d is different from a, b, and c).
(3) $a, b, c = g_y \nvDash a = g_y$.
(4) $a, b, c = g_y \nvDash b = g_y$.
(5) $a, b, c = g_y \nvDash c = g_y$.
(6) Ea and Eb and Ec $\nvDash$ Eg_y. (where 'E' is an existence predicate).
(7) Ea and Eb and Ec $\nvDash a, b, c = g_y$.
(8) Ea and Eb and Ec and $a, b, c = g_y \vDash$ Eg_y.
(9) $\exists t\ (a, b, c =_t g_y)$ and $\exists t\ (a, b, c =_t g_{y'}) \nvDash g_y = g_{y'}$ (where '$=_t$' means 'are identical at time t with').

Some might doubt that the g_y theory preserves classical logic. They might reason as follows: If a, b, and c are identical with g_y, then by the principle of substitutivity of identicals (SI), whatever is true of a, b, and c must be true of g_y. But a, b, and c are three things. So, it must be that g_y is three things. But g_y is one thing.

The g_y theorist can respond by formulating SI in such a way that it only applies to identity statements of the form '$x_1, x_2, \ldots, x_n = y_1, y_2, \ldots, y_n$' ($1 \leq n$),

but not to identity statements of the form '$x_1, x_2, \ldots, x_n = y$' or '$x = y_1, y_2, \ldots, y_n$' ($1 < n$) (Priest 2014, 96 [6.11]). The statement that *a*, *b*, and *c* are identical with g_y has the form '$x_1, x_2, x_3 = y$', hence SI is inapplicable.

When *a*, *b*, and *c* are scattered haphazardly, g_p does not exist and they do not constitute *h*. When *a*, *b*, and *c* are configured appropriately, g_p exists and this suffices for the unity of the whole. The existence of g_p is the crucial unity-conferring factor. The g_y theory parallels the g_p theory in this regard. It refuses to introduce anything other than *a*, *b*, and *c* to account for the unity of *h*, and makes the existence of g_y the crucial unity-conferring factor. Therefore, the g_y theory succeeds in solving the problem of unity, if the g_p theory does.

Let me now argue for (3), that the g_y theory offers a better account of generation and corruption than the g_p theory. Imagine that *a*, *b*, and *c* lie in disarray at time t_1. At time t_2 they are put together to form *h*. At time t_3, *h* is dismantled neatly back to the proper parts, *a*, *b*, and *c*, which then lie in disarray. Unity is absent at t_1, generated at t_2, and corrupted (absent again) at t_3.

At t_1, *a*, *b*, and *c* all exist but the gluon, whether it is g_y or g_p, does not. The absence of the gluon accounts for the absence of unity. At t_2, *a*, *b*, and *c* all exist and the gluon exists. The existence of the gluon accounts for the presence of unity. The order of explanation of the absence of unity at t_1 according to the g_y theory is this: *a*, *b*, and *c* exist but are not configured appropriately, so they are not (plurally) identical with g_y, so g_y does not exist, hence the unity of *h* does not exist. The order of explanation of the presence of unity at t_2 is this: *a*, *b*, and *c* exist and are configured appropriately, so they are (plurally) identical with g_y, so g_y exists, hence the unity of *h* exists. At t_3, when *a*, *b*, and *c* still exist but are no longer configured appropriately, the situation reverts back to that at t_1, and the unity is no more.

Compare this with the piano-lifting scenario. When Al, Bob, and Chad are scattered around town, they are not lifting the piano. But when they come together and collaborate appropriately, they lift the piano. Then they part company and collaborate no more. The situation reverts back to the original, and they no longer lift the piano.

The explanation of the lifting of the piano by Al, Bob, and Chad, and the explanation of the failure thereof are natural and plausible. The explanation of the unity of *h* and the explanation of the lack thereof are equally natural and plausible. This is so because of the plural predication. Plural predication plays an essential role in the piano-lifting case, and this essentiality carries over to the unity case.

How does g_p manage to come to exist, and once existent, how does it manage to go out of existence? At t_1, *a* exists, *b* exists, and *c* exists. What is identical with g_p exists (three times over!). Why does g_p not exist then? Likewise about t_3. And given that g_p does not exist at t_1, it is not obvious how it manages to

come into existence at t_2, for neither *a*, *b*, nor *c* has changed its ontological status from t_1 to t_2.

The only plausible response I can think of is to say that at t_2, g_p is identical with *a* (and with *b* and with *c*) but that at t_1 and at t_3, g_p is not identical with *a* (or with *b* or with *c*); identity is temporally 'local' (2014, 26).

But now the question returns in a slightly different guise: How does g_p manage at t_2 to be identical with *a*, and manage at t_3 to cease to be identical with *a*? There seems to be no way to answer this question except by mentioning the appropriate configuration into which *a*, *b*, and *c* come at t_2 and out of which they go at t_3. If this is the way to answer the question, then three further questions arise: (i) Why does g_p need cooperation from objects (*b* and *c*) which are completely distinct from *a* in order to be identical with *a*? (ii) Why does the identity of g_p with *a* require cooperation from those specific objects (*b* and *c*) in that specific fashion (appropriate configuration)? (iii) How does g_p become identical with *a* and at the same time become identical with something entirely distinct, *b* (and *c*)?

By contrast, g_y becomes identical with *a*, *b*, and *c* (together) by virtue of *a*, *b*, and *c*'s jointly becoming relevantly configured. Again remember the analogy with the piano-lifting case.

It is not just the bricks that constitute the house. The clay particles making up the bricks also constitute the house. Is it then not the case that the gluon g_y, responsible for the unity of the house, is identical with the bricks and identical with the clay particles? And if it is, then assuming, as classical logic says, that identity is an equivalence relation, it follows that the bricks are identical with the clay particles. But bricks are never identical with clay particles. Therefore, the g_y theorist needs to deny that identity is an equivalence relation, defying classical logic.

The g_y theorist can respond to this objection by postulating two distinct gluons for the bricks and clay particles. One of the gluons, g_{yb}, unifies the bricks into the house, and the other gluon, g_{yc}, unifies the clay particles into the house. A third gluon unifies half-bricks into the house, a fourth gluon unifies molecules into the house, and so on.

This proliferation of gluons does not put the g_y theorist at a disadvantage. The g_p theorist is in as much need of postulating different gluons for the clay particles, half-bricks, molecules, etc. Of course, the g_p theorist has an option of claiming that all such gluons are identical with one another (as well as being non-identical with one another). But this does not make the g_p theory more desirable than the g_y theory.

In postulating a single gluon with which the bricks are to be identical, is the g_y theorist not assuming that there is no problem with many being one? That is, does the postulation of g_y not already presuppose that the problem of unity has been solved?

Suppose that this is a good objection against the g_y theory. The strength of the objection is due to the fact that the g_y theory identifies the many parts, *a*, *b*, and *c*, with a single gluon. But the g_p theory identifies *a*, *b*, and *c* with a single gluon, too. So, the objection applies to the g_p theory with equal force.

This is too fast, the objector will protest, for it ignores the difference between plural predication and singular predication. This is a fair response. But it only pushes the location of the important parity between the two gluon theories a little further. The g_p theory's identification of the parts with the gluon engenders singularity out of plurality as much as the g_y theory's. Even though the g_p theory's identification of the parts with the gluon is not by means of plural predication, the identification is repeated plural times. Let us call these plural, repeated identifications 'i_1', 'i_2', and 'i_3'. All of i_1, i_2, and i_3 are identifications of something – one each of three different things – with a single common gluon, g_p. With the g_y theory, the plural *a*, *b*, and *c* converge on the singular g_y. With the g_p theory, the plural i_1, i_2, and i_3 converge on the singular g_p. If the first theory is vulnerable because of the convergence, so is the second. It is true that the plural i_1, i_2, and i_3 do not converge on the singular identification, but the two convergences are importantly similar. In both of them, the plural *a*, *b*, and *c* end up being identified with a singular gluon – via plural predication in the g_y theory, and via plural identifications in the g_p theory.

Note

1. No claim is implied about the active/passive-voice distinction of the identity predicate.

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