

## LEIBNIZ ON SENSATION AND THE LIMITS OF REASON

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The taste of burnt coffee, the smell of lemon-scented cleaning fluid, the sound of F# played poorly on a bassoon: these sensations are not just unpleasant but deeply puzzling. Why should this particular set of pressure waves bring about this auditory sensation and no other? Why should this arrangement of atoms cause this and only this lemony scent?

These questions are liable to evoke in readers' minds the "explanatory gap."<sup>1</sup> That gap stretches between neural states on one hand and technicolor experience on the other: how can states of the hunk of meat between our ears explain mental states, with their own peculiar phenomenal character? The moderns, however, are worried about a different gap altogether.

In a letter to Queen Sophie Charlotte, Leibniz summarizes the explanatory gap he is worried about:

[The external senses] allow us to know their particular objects, which are colors, sounds, odors, flavors, and the tactile qualities. But they do not allow us to know what these sensible qualities are, nor what they consist in, for example, whether red is the rotation of certain small globes which, it is claimed, make up light, whether heat is a vortex of very fine dust, whether sound is produced in air as circles are in water when a stone is tossed in, as some philosophers claim. We do not see these things, and we cannot even understand why this rotation, these vortices, and these circles, if they are real, should bring about exactly the perceptions we have of red, heat, and noise. (AG 186/G VI 499)<sup>2</sup>

However far science advances in understanding the causal relationships involved, it will always fall short of a full explanation of sensation. Plug in whatever analysis of sound or color you like, Leibniz suggests, and you still will not understand why we experience the sensible qualities we do. Such qualities are, in short, "occult."<sup>3</sup>

From a contemporary perspective, it can be hard to see just what Leibniz is worried about. The real action, one might think, lies at the intersection of the brain state and the phenomenal state. That a neural state should give rise to a mental state at all, let alone one of this precise character and no other, is the only real mystery. The connection between the mental state and its cause outside the body is neither particularly interesting nor particularly problematic.

To see the force of Leibniz's worry, consider some experiences where his explanatory gap does *not* arise, namely, experiences of primary qualities. Why does a penny, seen straight on, look circular? Because it is. The facts of the world outside the mind fully account for the contents of one's perception. Now, of course, when held at an angle, the penny looks elliptical. But even here there is no gap; the fact that it looks elliptical can be explained by a combination of optics and geometry. Once one is in possession of the relevant facts, even in their broadest outlines, any air of mystery evaporates. The match between sensory experiences of size, shape, and motion and the size, shape, and motion of real objects is a tight one.

By contrast, the mystery surrounding our initial questions persists even in light of causal illumination. Why should we sense red and not blue when we are in the presence of a tomato, in standard conditions? The inverted spectrum thought experiment is one familiar reflection of the slack between some of the features given in experience and their causes: if one of us were sensing blue instead of red, there might be no way to tell.<sup>4</sup> The precise distribution of color experiences seems not to matter much to behavior, provided the structural relations among the experiences are preserved. No one, as far as I know, has been much tempted by a parallel thought experiment using the inversion of shape or size. If one of us senses cubes where the other senses spheres, that difference will soon enough make itself felt in experience. In what follows, I'll call experiences of "sensible qualities" such as tastes, smells, and colors "sensations."<sup>5</sup> The problem, then, is that there is a "looseness of fit" between the way the world outside the mind is and the sensations we find ourselves undergoing. The principle of sufficient reason (henceforth PSR) demands that there be an explanation for why just this sensible quality (say, red) and no other is experienced when it is.<sup>6</sup> Yet, particularly where colors are concerned, Leibniz recognizes that making room for even an in-principle explanation is no mean feat.

Leibniz is among the most optimistic of the moderns and the most creative. So it is no surprise that he deploys an ingenious method to take up the slack between sensations and their causes. Leibniz argues that sensations are representations because "there is a resemblance of a

sort” between them and their objects (NE 131). If so, it is no coincidence that yellow sensations happen in the presence of the sun and not of dirt.<sup>7</sup> For the yellow sensation represents (some property of) the sun and not (some property of) the dirt. Sensations do not, after all, slip through the net of explanation.

After considering a variety of ways of understanding Leibniz’s thesis, I conclude that none of them succeeds in closing the gap. In the end, the only explanation for the precise pairing of a sensation and its object comes from God’s choice of possible world. Leibniz never explicitly offers this explanation, for he seems to have been convinced that representation is sufficient to close the gap. Nevertheless, his view has the resources to solve the problem.

Before beginning, let me enter two caveats. First, I shall mainly be concerned with Leibniz’s *New Essays*. It can be unclear at times just how seriously Leibniz means us to take his claims; in particular, he seems to accept more of Locke’s ontology than he does in other late works, like the *Monadology*. It would not be unusual for Leibniz to adopt the framework of his interlocutor in order to allow his arguments to make contact with their targets. In any case, I propose to table the question whether Leibniz even believes there are bodies until the end.

Second, I will throughout try to pare away what I regard as controversial contemporary assumptions. In particular, as I’ve already argued, Leibniz’s core concerns in the *New Essays* do not include phenomenal character or “what-it’s-like.” Given his focus on sensible qualities, it would be more accurate to say that Leibniz is worried about “what-it’s-of”: just what are these sensible qualities we meet with in sensory experience? Most of my interlocutors either disagree or do not make the distinction.<sup>8</sup> This makes entering into debate with them an opportunity for confusion and talking at cross-purposes. In general, then, when I speak of sensations and of sensible qualities, I am bracketing all questions of phenomenal character. Only when addressing competing views will I take up such issues.

### 1. LEIBNIZ’S EXPLANATORY GAP

The moderns in general, and Locke in particular, are impressed by the apparent arbitrariness of sensations. In the *New Essays*, Leibniz bristles at the implication: there are states of affairs that are, in principle, inexplicable. To suggest that the sensation of F# just happens to be correlated with such-and-such pressure waves is to violate the PSR. As Leibniz has Theophilus put it,

It must not be thought that ideas such as those of color and pain are arbitrary and that between them and their causes there is no relation

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or natural connection: it is not God's way to act in such an unruly and unreasoned fashion. (NE 131)

From Leibniz's point of view, the Cartesians—including Locke—think God provides our soul with sensations “without concern for any essential relation between perceptions and their objects” (NE 56; see NE 131). As Leibniz reads him, Locke is denying that there is any explanation, other than a brute causal one, for the connection between objects and our sensations. While understandable, that reading is not quite fair, since Locke's epistemic modesty prohibits him from making such a claim. The nearest Locke comes is this:

Body, as far as we can conceive, being able only to strike and affect body, and motion, according to the utmost reach of our ideas, being able to produce nothing but motion; so that when we allow it to produce pleasure or pain, or the idea of a colour or sound, we are fain to quit our reason, go beyond our ideas, and attribute it wholly to the good pleasure of our Maker. (*Essay* IV.iii.6:541)

The epistemic language—“as far as we can conceive”—suggests that Locke is not making a metaphysical claim. And presumably Locke isn't recommending that we “quit our reason.” The point is that our conceptual resources are too meager to allow us to construct an explanation, not that there cannot in principle be one. Nevertheless, there are good grounds to think that the bolder claim is, in fact, true, if one accepts the primary/secondary quality distinction. What would count as an explanation of the connection between a given set of pressure waves and the sensation of F#?

To see Leibniz's answer, we first need a clearer understanding of his notion of sensation. On his view, sensations arise out of *petites perceptions*. These perceptions are *petites* in that they are individually unnoticeable. Only in the aggregate do they make themselves known, by virtue of their variation with previous sets of perceptions or by their collective force or “size.” When perceptions are distinct, they are apt to be noticed by a mind and *apperceived*.<sup>9</sup> And when they are, they “form” (*forment*) the “*je ne sais quoi*, those flavors, those images of sensible qualities, vivid in the aggregate but confused as to the parts” (NE 54–55).<sup>10</sup>

Sometimes Leibniz seems to take sensations just to be complexes of *petites perceptions* (call this the “aggregate” view).<sup>11</sup> In other words, Leibniz does, after all, *sait quoi*: if only we had the ability to tease apart all the individual *petites perceptions*, we would become aware of a multitude of representational states. The running together of *petites perceptions* in consciousness leads us to mistake what is, in fact, a heterogeneous multitude for a simple, unanalyzable unity.

At other times, however, Leibniz suggests that sensations are the *result* of these complexes (call this the “emergent” view). On the emergent view, the confusion of *petites perceptions* results in a sensation that *really is* simple and unanalyzable.<sup>12</sup> Even within a single work, there is evidence for each. In the *New Essays*, for example, Leibniz tells us that “[T]here are motions in the fire that are not distinctly sensible individually, but whose confusion or conjunction becomes sensible and is represented to us by the idea of light” (NE 132).<sup>13</sup> The beginning of this sentence looks like evidence for the aggregate view: it is the confusion that becomes sensible. But note that it is a confusion of motions in the fire, not of *petites perceptions*. And this confusion of motions becomes sensible by being represented to us by the idea of light. That suggests emergence, not aggregation.

Elsewhere in the *New Essays*, Leibniz talks as if he has the aggregate view in mind. When a wheel spins fast enough, its rotation “makes the teeth disappear and an imaginary continuous transparent [ring] appear in their place.” For this reason, Leibniz prefers to call colors, tastes, and so on phantoms (“fantômes”) “rather than qualities or even ideas” (NE 403–4).<sup>14</sup> These *fantômes* disappear if we look at the minute perceptions individually, just as the illusory solid wheel vanishes from experience when we slow it down.

It is very hard to tell whether Leibniz endorses the emergent or aggregate view; each has considerable support.<sup>15</sup> Happily, that question is orthogonal to our concerns here. For whether a Leibnizian sensation is simple or complex, it can still be said to represent its object by resembling it. Our questions, then, are two: what does Leibniz mean by “resemblance”? And is resemblance in the relevant sense enough to close his explanatory gap?

## 2. LITERAL RESEMBLANCE

One possibility is that Leibniz’s sensations resemble what they represent in the ordinary sense of the term. Two cubes resemble each other in respect of shape just in case each instantiates the (qualitatively) same shape.

Such a view would, I think, close Leibniz’s explanatory gap. A sensation of F# is the only sensation that could arise out of (or simply be) this aggregate, given the *petites perceptions* that make it up. And those tiny perceptions have to be as they are, for they instantiate just the same properties that their objects in the world do. If representation is literal resemblance, then any variation in the property represented means that the representing state, in fact, fails to represent its target.

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Typically, philosophers count that point against resemblance theories. In our context, it would be a virtue.

Does Leibniz, as Alison Simmons claims, mean “the resemblance talk as literally as possible” (2001, 68)?<sup>16</sup> Unfortunately, I do not think the textual evidence supports this claim. In the *New Essays*, Leibniz writes,

It must not be thought that ideas such as those of color and pain are arbitrary and without relation or natural connection with their causes; it is not God’s way to act with so little order and reason. I would say, rather, that there is a resemblance of a sort, not a perfect one which holds all the way through, but a resemblance in which one thing expresses another through an orderly relationship. (NE 131)<sup>17</sup>

Here, Leibniz seems clearly to be rejecting resemblance and substituting his own distinctive notion of expression.<sup>18</sup>

Further evidence points us in the same direction. In the preface to the *New Essays*, Leibniz claims that *petites perceptions* “bring it about that those perceptions of colours, warmth and other sensible qualities are related to the motions in bodies which correspond to them” (NE 56). It is by virtue of the fact that the *petites perceptions*, imperceptible individually but covarying with motions in bodies, prompt sensations that those sensations stand in “precise and natural” relations with those motions.

Our result might have seemed inevitable had we not been so narrowly focused on vision. It is one thing to suppose that the sensation of the blurred wheel might be a confused apprehension of literally resembling pictures of the wheel. But how could the sound of F# resemble the mechanical cause, say, a vibrating string? True, if the aggregate reading is correct, the resemblance is happening at a level not open to introspection. It is the *petites perceptions* that resemble the object in the world. Still, it is obscure just how an unnoticed tiny perception of a sound is better placed to resemble a vibrating string than a big, noticed aggregate of tiny perceptions (or, if you prefer, the appearance of that aggregate).

### 3. RESEMBLANCE AS EXPRESSION

Even if Leibniz’s resemblance is not of the literal sort, it might still help him close the explanatory gap. What other varieties are available? Perhaps the most promising one is isomorphism, as Pauline Phemister has suggested. As she reads Leibniz’s exchange with Lady Masham, among other texts, it is the “thoroughgoing isomorphic mapping of the [the soul’s] perceptions to the motions of its body” that secures the “intelligibility and naturalness” of the sensation/object link (2011, 97 and 99).

One might have different standards of intelligibility or naturalness, of course. Our question is this: can the fact that the states of the soul

express states of the body close Leibniz's explanatory gap? Here we must proceed with caution, since we cannot take for granted that Leibniz has in mind what we would call "isomorphism."

In what sense, precisely, does Leibniz think sensations "express" their causes? In general, expression names a relation that holds when one thing, state, or property allows one to infer something about another thing, state, or property. This broad notion is, I suggest, made precise in three very different ways in Leibniz's work. Our first kind of expression, call it "Expression<sub>1</sub>," is indication by way of causation: as Leibniz puts it, "[E]very effect expresses its cause." In such contexts, he claims that the object of every perception is God (*Discourse* § 28, AG 509).<sup>19</sup> That any substance exists at all allows one to infer that God exists since God is its cause. Expression<sub>1</sub> is of no use to us in taking up the slack between sensations and their causes: to say that a sensation has a cause is not to give an explanation, in the sense required by the PSR.

A second kind of expression is what we might call predicative. The predicates that are true of one substance are mirrored by the predicates that are true of another. One state of Adam that might "express<sub>2</sub>" a state of Cain is Adam's being the father of someone with all of Cain's properties; similarly, Cain will have the property of being the son of someone with all of Adam's properties. Expression<sub>2</sub> holds among substances when their properties answer to each other in the way exemplified by our Adam and Cain example.<sup>20</sup>

Although commentators sometimes claim—or, more often, assume—that Expression<sub>2</sub> is the core sense of "expression" in Leibniz, there is still a further sense, one that does not appeal to relational properties like "standing in R to some substance that is F." To see this, consider Leibniz's own explications of "expression":

That is said to express a thing in which there are relations that correspond to the relations of the thing expressed. ("What Is an Idea?" [1678], L 207/G VIII 263).

It is sufficient for the expression of one thing in another that there should be a certain constant relational law, by which particulars in the one can be referred to corresponding particulars in the other. ("Metaphysical Consequences of the Principle of Sufficient Reason" [1712], PW176–7/C 15)

Expression<sub>3</sub> is not a question of a mirroring of predicates.<sup>21</sup> Instead, it can relate objects and states such as sensations. This is at least one sense in which all the perceptions of all substances "mutually correspond" with each other (see *Discourse* § 14, AG 47).

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As a first pass, we might say that Expression<sub>3</sub> holds among the members of two sets A and B when there is at least one relation among the members of A that is preserved among the members of B. As Chris Swoyer puts it, there must be a “structure-preserving mapping” from one to the other (1995, 82). Nothing in Leibniz, however, suggests that *every* relation in A must be preserved in B. As long as there is one such relation, one set will express the other. And at the risk of stating the obvious, Expression<sub>3</sub> is miles away from resemblance in the literal sense. Consider the example Leibniz uses to illustrate the “resemblance of a sort” he has in mind in the *New Essays*: “an ellipse, and even a parabola or hyperbola, resemble in some fashion the circle of which they are a projection on a plane, since there is a certain precise and natural relation between what is projected and that projection which is made from it” (NE 131). Even a square can express<sub>3</sub> a circle since it will preserve the “between” relation among the points.<sup>22</sup> If Expression<sub>3</sub> is at issue, it is not very difficult to see how sensations might express nonsensory states of affairs. After all, a little effort shows how you can pair the cardinal directions with the seasons and preserve the relation “is the opposite of.”<sup>23</sup>

On my reading, then, Leibniz does indeed claim that sensations both resemble and represent mechanical features of bodies. What he means by these claims, however, is just that sensations exhibit some relations that mirror some relations among the objects that cause them. In this attenuated sense, sensations “resemble” their causes. That claim is not enough to take up the slack between sensation and object. For any sensation at all would do just as well, as long as it was capable of standing in the relevant relation. Now, it might be that Leibniz does intend there to be a mapping from sensations to bodily states such that *every* relation in one set is mirrored in the other. Even if that is so, the central point remains unaffected. For as long as there is even one competing distribution that preserves all of these relations, the gap remains open.

Someone might object that, if I am right, there is no substantive point at issue between Locke and Leibniz when it comes to sensation. As it happens, I think this is, in fact, the case. Leibniz consistently exaggerates both the arbitrariness of Locke’s view and the explanatory powers of his own. Consider how Martha Bolton sees the dispute: Leibniz claims, and Locke denies, that a sensation “carries information” by means of a “structural analogy” (2011, 211). For my part, I cannot see why Locke would deny that claim: after all, he spends much of *Essay* II.xxx–xxxii arguing that God has provided us with ideas of both primary and secondary qualities to aid us in finding our way through the world. Such ideas could hardly perform this function if they did not carry “information” in the very minimal sense Leibniz believes they do.



Still, it's important not to exaggerate the shortcomings of Leibniz's position in the *New Essays*. Against Locke as Leibniz reads him, Leibniz's view is a significant step toward accommodating the PSR. Leibniz can truly say that sensible qualities, even if they are mere *fantômes*, cannot be randomly sprinkled over our experiences. They at least must stand in the systematic relationships we've discussed. What is more, Leibniz might well argue that the arbitrariness of some sensible qualities is exaggerated. The taste of acidity, for example, might play a significant role in the preservation of the mind-body union. I want to leave open the degree to which the preservation of the life of the subject might explain at least some of the pairings of sensible and primary qualities.

Nevertheless, if there are even two incompatible distributions of sensations that do not sin against these considerations, Leibniz will have failed to bring in the slack. In other words, expression, in any of its senses, cannot do *all* the work required by the PSR. That is not the end of the matter since there might be some other notion that can. In particular, we should consider whether Leibniz's notion of analysis can help.

Leibniz consistently maintains that we can give an analysis of sensations. In a short piece on analysis and synthesis, Leibniz claims that, although a sensation cannot be given a nominal definition, "its nature is analyzable, since it has a cause" (*De Synthesi* L 230/A VI 4 540). Having a cause, as we have seen, falls far short of being intelligible, in the sense the PSR requires. In another text, however, Leibniz suggests a more promising kind of analysis:

The secret of analysis in physics consists in this one device: the reduction [*revocatio*] of the confused qualities of the senses (namely: heat and cold in the case of touch, flavors in the case of taste, odors in the case of smell, sounds in the case of hearing, and colors in the case of sight) to the distinct qualities that accompany them, namely number, size, shape, motion, and cohesion, of which the last two are proper to physics.

Leibniz's talk of sensations that "accompany" (*comitantur*) experiences of primary qualities betrays a total absence of reductive aspirations. G. H. R. Parkinson's deflationary reading of *revocatio* as merely tracing an effect to its cause is confirmed by the sequel:

For with the aid of certain qualities that are sufficient to determine the nature of bodies, we can discover their causes, and from these causes we can demonstrate their other effects, i.e., the rest of their qualities, and so in a roundabout way discover what is real and distinct in confused qualities. For that remainder that cannot be explained (as, for example, the way in which the appearance we call yellowness arises out of that in which we have shown yellowness to consist objectively) must be known to depend, not on the thing itself, but on the disposition

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of our organs and on the most minute structure of things. (*Revocatio* [1677], C 190, trans. Parkinson 1982, 20)

Here we have an intricate structure of causal dependence that still falls short of explanation. Although one can use sensations in this “round-about” way to learn something of the primary qualities of bodies, Leibniz says there will always be a “remainder that cannot be explained.”

Something in sensations resists analysis, even if we take a different view of the relation between sensations and experiences of primary qualities. The *Revocatio* treats them as mere accompaniments, but, in the letter to Queen Sophie Charlotte, Leibniz tells us that size and shape are *in* color. Since sensible qualities “are in fact occult qualities . . . there must be others more manifest that can render them explicable” (AG 186/G VI 492). Size and shape, it seems, are these “more manifest” qualities. In this respect, “sensible qualities are capable of being explained and reasoned about” (AG 187/G VI 500). A visual shape is perceived by perceiving color; still, *which* color it is seems to make too little difference. It is just as easy to generate the inverted spectrum scenario, indicating that a gap remains. Even when features we can fully understand are contained within sensible qualities, those qualities remain occult.

Let us consider one final sense in which we can “analyze” colors. Leibniz tells us, in both the *New Essays* and the “Meditations on Truth, Cognition, and Ideas,” that the idea of green in some sense can be resolved into the ideas of blue and yellow. But Leibniz never suggests that such an analysis can be given for all sensations. Second, this analysis only shows us the causes of the sensation. So when Leibniz claims in the *New Essays* that *some* sensations “do admit of real definitions,” he means only that we can figure out “what causes them” (NE 297).

In the end, neither representation nor any of the other notions Leibniz appeals to can close his explanatory gap. We know, given the PSR, that all explanatory gaps are due to our benighted epistemic state. But there is no good reason to think that, even in principle, we can use these representational strategies on their own to explain why just this sensation and no other occurs in the circumstances that it does. Now, Leibniz’s view, as developed so far, does rule out God’s randomly sprinkling minds with sensations, in no particular order; it also rules out God’s flipping our spectra (unless he has some further reason to do so). While these points take us some distance in appeasing the PSR, they do not take us all the way. Systematically inverted color spectra would do just as well at preserving whatever structural relations one likes. It is perhaps telling that Leibniz declines to take up Locke’s inverted-spectrum thought experiment in the *New Essays*. For, if I am right, the Leibniz of the *New Essays* has no good answer to the problem it poses for the PSR.

In the next section, I argue that Leibniz's system has the resources to construct such an answer, even if he does not explicitly offer it. Before turning to that response, however, let me entertain an objection. One might think that it is simply obvious that expression, in any sense, will not be able to take up all the slack in Leibniz's system. Sensations will slip through the net. One might then argue that Leibniz must have seen this. Charity might then require us to read Leibniz very differently than I have, as, say, an intentionalist *avant le mot*.

I would argue that we are justified in assuming neither that the problem with expression is obvious nor that Leibniz must have seen it if it were. M. H. A. Newman proved that any two sets of equal cardinality can be isomorphic: "Any collection of things can be organised so as to have [a given structure], provided there are the right number of them" (1928, 144). The point was presumably not obvious to the target of Newman's argument, Bertrand Russell, nor does it appear to have been obvious to Carnap. We should not be surprised if Leibniz fails to have foreseen Newman's point. Happily, Leibniz's resources include more than the doctrine of expression.

#### 4. THE BEST POSSIBLE WORLD

Once we give up on the claim that sensations can be tied to their objects by means of their own intrinsic and nonrelational qualities, as the literal resemblance view has it, we are forced back on the expression relations in which those sensations stand. And even those relations are insufficient. The only real way to close Leibniz's explanatory gap is to appeal to the doctrine of the best possible world. As we shall see, Leibniz will still need to exploit the resources we discussed above. The doctrine of expression has an important role to play. My claim is that it cannot close the gap on its own, but only in tandem with the doctrine of the best possible world.

Note that a number of criteria constrains God's choice of world. God wants to create the greatest variety with the simplest means.<sup>24</sup> And, of course, he wants to create a world in which each substance expresses all the others. Suppose, for the sake of argument, that these constraints determine just *one* possible world as the best among all others. Then the problem of sensation, I shall argue, disappears.

Why is this sensation, and no other, instantiated in this substance at this time? Leibniz can give a three-stage answer. Expression<sub>3</sub> requires that at least one or more relations among the perceptions of one monad be mirrored by the relations among the perceptions of the other monads. Expression<sub>2</sub> requires that the predicates of any substance, including predications of perceptions of sensible qualities, be mirrored by the predicates of

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all other substances. Each perception follows from a substance's complete concept, from which all its predicates, future and past, are deducible.

That leaves us with the question: why is this substance, with this sensation at this time, instantiated? The only answer can be that this substance is a necessary ingredient in the best possible world, in which each substance expresses every other. There is no more reason to be worried about sensations than about perceptions generally. What satisfies the PSR, what really explains why this sensation and no other occurs, is the uniqueness of the best possible world.

All of this is consistent with the fact that, from our benighted point of view, we cannot attain a complete grasp of just *why* the actual distribution of sensible qualities is as it is and not otherwise. But the doctrine of the best possible world assures us that there is such a reason. That claim is something we know *a priori*.<sup>25</sup> It would indeed be impossible to examine the empirical evidence bit by bit and conclude, on the basis of experience, that our world is the best one possible.

But, of course, such a situation is hardly unusual. The same is true of the presence of suffering in the world. We know that such suffering is in the end for the best, not because we have privileged insight into the arrangement of the world but because we know it was created by a God who acts only for the best and produces the one and only world that maximizes the features he values.

Let me consider one last complication. There is a lively debate about whether Leibniz even believes in corporeal substance. He might be acquiescing in such talk only for the purposes of argument (as might be the case in the *New Essays*), or he might intend such language to be translated ultimately into the ontology of simple substances.<sup>26</sup> Some authors, such as Daniel Garber, have argued that Leibniz's middle period is simply agnostic with respect to corporeal substance; still others, that Leibniz's ontology is ultimately incoherent.<sup>27</sup>

Nevertheless, it is worth asking what Leibniz's view amounts to, if we try to make it conform to what Leibniz, in the *Discourse*, calls "rigorous metaphysical truth" (AG 59). There, as elsewhere, Leibniz challenges the distinction between primary and secondary qualities.<sup>28</sup> If his explanatory gap presupposes that distinction, might not his idealist metaphysics, which abandons it, close the gap without appeal to the uniqueness of the best possible world?

In fact, idealism would make the gap wider, not narrower. For then it would arise not just with regard to our experiences of secondary qualities but with all sensory perceptions whatsoever. If anything, then, the idealist's rejection of the primary/secondary quality distinction makes

the need for the doctrine of the best possible world all the more pressing. Idealism is not a solution to the problem posed by the clash between sensible qualities and the PSR. True, there would then be no *special* problem of squaring sensations with the PSR, but only because all qualities would be equally unmoored from any explanation in terms of the sizes, shapes, and motions of bodies. Hence, outside the context of the *New Essays*, it is, if anything, even clearer that Leibniz's only solution is to appeal to the uniqueness of the best of all possible worlds.

## 5. CONCLUSION

Pressure waves cause sensations of musical notes; wavelengths of light cause sensations of color. The PSR demands an explanation: why just these sensations and no others? To declare the connection arbitrary is to admit a "looseness of fit" into the nature of things no explanatory optimist can tolerate.

Leibniz, for his part, sees the problem clearly and tries to solve it. His surface solution—representation as expression—can bring in some, but not all, of the slack. Even after we see that sensations represent (by expressing) their objects, there is still a degree of arbitrariness. Any change in qualities that preserves expression will escape the PSR's net, for it generates multiple but equally satisfactory distributions of sensible qualities.

And yet, or so I have argued, there is no problem of sensation for Leibniz, only a problem of the uniqueness of the best possible world. If Leibniz were able to muster a satisfactory argument for the claim that there is only one world among all others that is the best, that argument would at once dissolve Leibniz's explanatory gap. Now, I do not claim that mounting such a uniqueness argument is easy or even possible. Nevertheless, absorbing one problem into another should count as philosophical progress.<sup>29</sup>

Tracking Leibniz through this maze can teach us two lessons, I think. The first is simply that his explanatory gap exists. Philosophers friendly to the PSR have as much reason as Leibniz to worry about squaring it with the facts of sensation. The second lesson is that there is rather less to his appeals to representation than one might have hoped. Representation does not close Leibniz's explanatory gap. I suspect this result is no accident and that contemporary attempts to deal with sensations and related issues like phenomenal character in terms of representation are equally doomed. But that is an argument for another day.<sup>30</sup>

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Keywords: Leibniz, sensation, representation, principle of sufficient reason

## NOTES

1. See Joseph Levine (1983, 354). In its initial, Kripke-inspired form, the gap lies between the physical and phenomenological sides of the identity theorist's equations. As Levine goes on to point out, of course, the gap is a problem for materialism generally. (Block-style arguments open up the same gap for functionalist theories, for example.)

2. The following abbreviations are used for works of Leibniz: A = Leibniz 1923–; AG = Leibniz 1989; C = Leibniz 1903; G = Leibniz 1875–90; PW = Leibniz 1973; L = Leibniz 1976; and NE = Leibniz 1996, whose pagination is that of Leibniz 1923–. References to the *Monadology* are to section numbers in G VI 607–8; unless otherwise noted, translations follow those in AG.

3. I am not denying that Leibniz is concerned about mind-brain relations; the pre-established harmony is intended in part to cover just that sort of case. What I am claiming is that the core issue about sensation in the *New Essays* is not phenomenal character but the status of sensible qualities.

4. For the thought experiment, see Locke's *Essay*, II.xxxii.15:389. (References to the *Essay* are in the following format: book.chapter.section:page number in Locke 1975.) C. L. Hardin (1997), among others, suggests that inverted spectra might not, after all, escape behavioral detection. If so, the scenario described by Locke would not be possible. Settling this issue would require disambiguating various notions of possibility and would take us too far afield. I invoke the inverted spectrum here only as an illustration, not as a premise in an argument.

5. While I follow the literature in using “sensation” in this way, it is potentially misleading since there are, of course, sensory experiences of primary qualities.

6. For statements of the principle of sufficient reason, see, for example, the *Monadology*: “we can find no true or existent fact, no true assertion, without there being a sufficient reason why it is thus and not otherwise” (§ 32).

7. I do not mean, of course, to suggest that the sensation itself is yellow; rather, this is short for a sensation *of* yellow. (“Sensation,” like “perception,” exhibits the familiar “ing/ed” ambiguity.)

8. If I am right, then much of the secondary literature is wrong to think of Leibniz as confronting the problem of “phenomenal character” in these texts. In particular, it is a mistake to read contemporary intentionalist theories of phenomenal character back into Leibniz, as Alison Simmons (2001) and Michael Della Rocca (2008, 118) do. Note that Simmons (2011) in some respects revises her earlier reading of Leibniz as endorsing a higher-order theory of consciousness. These changes are not material to our discussion here.

9. Here I follow Simmons in thinking that a perception's being distinct is its aptness to be noticed, a disposition that is grounded in the size, number, and variation among the *petites perceptions* (2001, 58; see also Simmons 2011).

10. Some might take the “*je ne sais quoi*” as a sign that Leibniz has the contemporary notion of phenomenal character in mind. Instead, Leibniz is pointing to the inability to convey a conception of the “vivid-confused” in words. Leibniz argues that a person born blind could achieve a thorough understanding of geometry and, presumably, physics, though he would “not be able to achieve a conception of the *vivid-confused*, that is, of the image of light and colours” (NE 137).

11. For example, Leibniz writes, “a perception of light or colour of which we are aware is made up of [*composée de*] many minute perceptions of which we are unaware” (NE 134).

12. Defenders of the aggregate view include Simmons (2001) and Stephen Puryear (2013); Shane Duarte (2009, 709–10) and Martha Bolton (2011) defend the emergent view. The debate is well summarized by Christian Barth (2014).

13. I should note that there is a different sense of “confusion” at play in other Leibnizian texts. For example, in “On Wisdom,” Leibniz explains the appeal of music by observing, “Everything that emits a sound contains a vibration or a transverse motion such as we see in strings; thus everything that emits sounds gives off invisible impulses. When these are not confused, but proceed together in order but with a certain variation, they are pleasing” (L 425–26). Leibniz’s notion of confusion here is what we would call dissonance.

14. Remnant and Bennett translate *fantôme* as “image” rather than the more literal “phantom” because *fantôme* carries the suggestion of illusoriness, which image doesn’t. See their footnote 1 on 404. This is a strange procedure: clearly Leibniz’s point is that there *is* something illusory about sensations, and that’s exactly *why* he chooses *fantôme* rather than *image*.

15. Further support for the aggregate view might come from Leibniz’s discussion of sensations in the “Meditations on Knowledge, Truth, and Ideas” from 1684. There, Leibniz classifies the kind of *cognitio* (awareness or knowledge) involved as at once clear and confused. Confused *cognitio* is such that we cannot “enumerate one by one marks [*nota*] for differentiating a thing from others. . . And so we recognize colors, smells, tastes, and other particular objects of the senses clearly enough, and we distinguish them from others, but only through the simple testimony of the senses, not by way of explicit marks” (AG 24). Similarly, the letter to Queen Sophie Charlotte tells us that the “notions of the particular senses” are “clear but confused” (AG 187). (I am grateful to an anonymous referee for directing me to these texts.) This picture fits nicely with Leibniz’s discussion in NE of the congenitally blind person (NE 137; see above, note 10). On the emergent side, however, we have to register the very end of the 1684 “Meditations.” There, Leibniz claims that, when we see green in a mixture of blue and yellow powder, “we sense only blue and yellow finely mixed, even though we do not notice this, but rather fashion some new thing for ourselves” (AG 27). And, indeed, even in NE, Leibniz claims that green “*est naist du bleu et du jaune*”; green is “born from” or “arises out of” blue and yellow. He does not say that green *just is* blue and yellow (NE 120; I owe this textual point to Duarte 2010, 709).

16. Earlier in the paper, Simmons points out that resemblance is just one way Leibnizian representation/expression can happen (2001, 41–42)

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17. And in a similar vein, a page later, Leibniz writes, “[W]hen the organ and the intervening medium are properly constituted, the internal bodily motions and the ideas which represent them to the soul resemble the motions of the object which cause the colour, the warmth, the pain etc.; or-what is here the same thing-they express the object through some rather precise relationship” (NE 132–33).

18. Simmons is, of course, well aware of this text and others that point in the same direction. Simmons replies to this counterevidence by saying, “The apparent concession [that is, the move from literal resemblance to isomorphism] does not help because there does not seem to be any more of an intelligible isomorphism between a sensation of light and motions in the fire than there seems to be an exact resemblance” (2001, 68). But, even if Leibniz’s retreat to isomorphism doesn’t help, he retreats nonetheless.

19. See also NE 267 and Rutherford 1995, 84.

20. For a precise formulation of this kind of expression, see Ari Maunu (2008).

21. Duarte (2009, 711) speaks of the connection between sensations and their objects as “natural signification.” While Duarte usefully contrasts this connection with conventional signification (exemplified in natural languages), precisely what he means by “natural signification” remains elusive. As far as I can tell, it is Expression.

22. For more detailed accounts of expression, see Mark Kulstad (1977), Swoyer (1995), and Valérie Debuiche (2013). Debuiche argues that both Kulstad’s and Swoyer’s accounts have a foundation in the texts and that the differences between them correspond to differences between the work of Desargues and Pascal, both of whom influenced Leibniz (see esp. Debuiche 2013, 415–16) Nothing for me turns on the differences among these accounts.

23. I owe this example to Steinhart (2009).

24. See, for example, *Monadology*, § 58.

25. My claims here are consistent with the fact that we know the reality and possibility of ideas of sensible qualities only through experience. As Leibniz says of sensible qualities in “Quelques Remarques sur le Livre de Mons. Locke,” “Aussi n’est ce point par elles-memes, ny a priori, mais par l’experience que nous en sçavons la realité ou la possibilité” (A 6.6, 8). It is the fact that, whatever they might be, they must be part of the best possible world that is known *a priori*.

26. See, for example, Brandon Look (2013) and Stephen Puryear (2013). I take no position here on whether Leibniz always or only occasionally endorses the mind-independent existence of corporeal substance.

27. For the first claim, see Daniel Garber (2009); for the second, Glenn Hartz (1998).

28. Leibniz writes that the “notions” of primary qualities “contain something imaginary and relative to our perception” (*Discourse* § 12, AG 44). For an idealist, there is no reason to privilege one set of qualities over the other: neither color nor shape, strictly speaking, belongs to a monad, only perception.



29. There is a substantial literature on the “no best possible world” objection. See, for example, David Blumenfeld (1995), Lloyd Strickland (2005a and 2005b), and Nicholas Rescher (2013). Strickland’s proposed reply to the objection (2005a), though not conducted in Leibniz’s terms, relies on the fact that the quality of a possible world is a function of a multiplicity of goods, not just the happiness of the creatures in it. This is certainly Leibniz’s view; one of the criteria will be the simplicity of the laws that operate in the world at issue. As Rescher points out, the issue is complicated by the fact that Leibniz “nowhere treats in detail the range of issues involved in determining the relative simplicity of law systems, and indeed he does not seem to recognize the complexities that inhere in this issue” (2013, 25). It seems to me that the prospects for answering the no-best-possible-world-objection in Leibniz’s case turn on just this sort of issue. The best general discussion I have found is Blumenfeld (1995). As Blumenfeld points out, Leibniz typically defines the best world as the one that maximizes variety and simplicity. But Leibniz also says that the best possible world is “the most perfect morally” (G VII 306/ L 489, quoted in Blumenfeld 1995, 398). Leibniz appears to think that the world contains as much happiness and virtue as possible. Moreover, in the *Tentamen Anagogicum* of 1695 (G VII, 270–79), Leibniz suggests that each part of the world (and not just the world as a whole) is perfect in itself, providing yet another constraint on the choice of possible world. Taken together, all of these criteria make it plausible, although far from certain, that there is indeed a unique best possible world. (This note is substantially indebted to an anonymous referee for this journal.)

30. An earlier version of this paper was presented at the University of Virginia in the spring of 2014. I thank all the participants, especially Brie Gertler, Harold Langsam, and Antonia LoLordo, for helpful criticisms. And I am indebted to two anonymous referees for this journal.

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