Varieties of Explanation in Defense of Humean Laws of Nature

Jan Swiderski
Syracuse University

Winner of the Houghton Dalrymple Award

I. Dialectical Landscape

Views of laws of nature can be divided into two camps according to their answer to the question: are laws mere regularities? Humeans answer in the affirmative. They are motivated by Lewis' doctrine of Humean Supervenience: "all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another" (Lewis "New Work for a Theory of Universals," ix). There can be no variation of any kind of fact without variation of these local matters—henceforth, "the Mosaic." Thus, on the Humean view, laws are determined by the Mosaic. Prominent defenders of Humeanism about laws include Lewis and Loewer. The anti-Humean camp disagrees. They argue that laws are not reducible to the Mosaic. More than mere regularities, the laws play some role fitting the metaphor of "governing." Anti-Humean, governing laws can be described as relations between universals (Armstrong What Is a Law of Nature, Dretske "Laws of Nature"), the powers or dispositions of particular objects (Ellis and Lierse), or irreducible to anything further (Maudlin).

All parties agree that laws of nature, together with initial conditions, are meant to explain worldly goings-on. Humean laws have been objected to for their failure to explain. Armstrong's classic argument is that, if one attempts to explain phenomena with laws understood as mere regularities,

> we are then trying to explain the fact that all observed Fs are Gs by

> appealing to the hypothesis that all Fs are Gs. Could this hypothesis serve as an explanation? It does not seem that it could. That all Fs are Gs is a complex state of affairs which is in part constituted by the fact that all observed Fs are Gs. 'All Fs are Gs' can even be rewritten as 'All observed Fs are Gs and all unobserved Fs are Gs.' As a result, trying to explain why all observed Fs are Gs by postulating that Fs are Gs is a case of trying to explain something by appealing to a state of affairs part of which is the thing to be explained. (Armstrong 40)

Maudlin puts it as follows. If, for the Humean, "the laws are nothing but generic features of the Humean Mosaic, then there is a sense in which one cannot appeal to those very laws to *explain* the particular features of the Mosaic itself: the laws are what they are in virtue of the Mosaic rather than vice versa." Call this the "circularity objection" (172)

Loewer defends L-laws against the circularity objection. He argues that there are two distinct senses of explanation: scientific and metaphysical. So long as there are two kinds of explanation, Humean laws produce no circularity. Scientific and metaphysical explanation, Loewer argues,

> are different enterprises. The relevant kind of metaphysical explanation is one in which a type of fact—say mental facts—is shown to be grounded in or constituted by some other kind of fact—say neurological fact. Metaphysical explanation need not involve laws and the explanandum and the explanans must be co-temporal (if the explanans is a temporal fact or property). Scientific explanation of a particular event or fact need not show that it is grounded in a more fundamental event or fact but rather, typically, shows why the event occurred in terms of prior events and laws. ("Humean Supervenience," 131-132)

There is no circular explanation: the Humean laws explain the Mosaic scientifically, and the Mosaic explains them metaphysically. But, since these two kinds of explanation differ, nothing explains itself.

However, Lange argues that any explanation provided by L-laws will be circular ("Grounding" 256). Even if metaphysical explanation differs from scientific explanation, the relations between explanations will obey the transitivity principle (*T*). *T* states that if *E* (scientifically) explains *F*, and *G* grounds *E*, then *G* (scientifically) explains *F*. On the Humean view, the laws explain the Mosaic, and the Mosaic grounds the laws. Then, by *T*, the laws explain the laws. The circularity objection still applies. L-laws offer no non-circular explanation.

If "metaphysical explanation" is understood to mean the same thing as "grounding", *T* can be stated as follows: if the explanans in a scientific explanation has grounds, those grounds explain the explanandum.[1] The defense of L-laws rests

on the claim that, in that specific case, the grounds of an explanans don't themselves explain the explanandum of what they ground. That is, in that specific case, the Mosaic doesn't explain the Mosaic. I will argue that the Humean should reject *T*. Here's a rough sketch of what's to come. In Section 2, I argue that a new defense of Humean laws is necessary. I argue for a more general principle contradicting *T* in Section 3: the variety view of explanation. In slogan form, I suggest that the Humean should consider explanation as variegated and context-sensitive, rather than univocal and absolute. What it takes for one thing to explain another is different from context to context. This view offers a principled reason to reject *T*: if there is a variety of explanatory relations, scientific and metaphysical explanation can reasonably be taken to be different. I conclude that the variety view offers a novel response to the circularity objection.

II. MOTIVATIONS

In this section, I motivate the need for a new defense of Humean laws appealing to a more general principle, rather than appeal to examples or counter-examples.

A strategy employed by Miller, Hicks and van Elswyk in defense of Humean laws has been to identify cases in which *T* fails. In many instances, Miller claims, "particular grounding facts about the mosaic are incidental to what is being explained" ("Humean Laws" 1321). For example, an explanation of a tsunami will tend to refer to such facts as the movements of tectonic plates, the propagation of seismic waves through large bodies of water, and so forth. Also, most would agree that facts about tectonic plates are grounded in the distribution of the fundamental particles in space-time. However, it would be rather strange to explain a tsunami referring to fundamental particles. Hicks and van Elswyk note that counterexamples like this one are "easily replicated" (438). Indeed, they argue that the Humean account of laws is itself such a counterexample (439).

I fear this strategy will end up in stalemate. Anti-Humeans have argued that *T* applies to the explanations of instances by laws (and vice versa) on the basis of the apparent ubiquity of situations in which *T* holds. Humeans have argued that *T* does not apply to the explanations of instances by laws (and vice versa) on the basis of many other situations in which *T* does not hold. No strategy consisting of evaluating the relative strengths of the rival examples or their relevance to the case at hand looks promising, and invites only begging questions and digging in heels. Nor is it fruitful to call explanation by Humean laws a counterexample, like Hicks and van Elswyk do: whether *T* applies to L-laws is just the issue at hand. What's more, Lange's (1341-1344) response that *T* apply strictly to contrastive explanation (why did *F* rather than *F** happen) seems to rule out each of the suggested counterexamples, and preserve the troubling circularity.

A way out of the stalemate is through an analysis of the concept of explanation, which I undertake in Section 3. My argument is that we understand explanation so

as to rule out *T* not just in the specific case at hand, but, rather, in any standard case. I claim that explanation is variegated, and that it is a rare coincidence that one thing explains another in more than one context. The nature of explanation varies with context in general, and metaphysical and scientific contexts are radically different. Failure of explanation across contexts is the rule, rather than the exception. In denying *T*, we are just following this rule.

III. Against the Transitivity Principle: Data from Everyday and Technical Explanation

Now, I will argue from examples of explanatory practices that *T* is contrary to standard usage of the concept of explanation. I will argue that explanation is taken to be effective only insofar as it succeeds in integrating facts into a unified system of knowledge. Whether some fact or group of facts is or is not an explanation depends on context. Since there is no single, most general systematization of knowledge, but various systematizations relevant to various special sciences, situations, or individuals, there is no general sense of explanation, but a variety of equally well-founded senses thereof.

Suppose you have become embroiled in some hopelessly complicated social conflict involving your neighbors, which is rife with misunderstandings, tenuous implications, and old grievances coming to light. Consider how you would explain the situation to somebody familiar with the particularities of each of the participants, their mutual relations and interests, and so on—perhaps another longtime neighbor just returning from a few months abroad—compared to how you would explain it to a compassionate (and probably very patient) friend, unfamiliar with these facts. Surely, one would offer different explanations. But there is certainly just one situation to be explained. Or consider your favorite philosophical argument—maybe Anselm's Ontological Argument. How would you explain it to a philosopher? To a theologian? To an undergraduate? To a young child? Again, each explanation would be different, even though there is but one Anselmian Ontological Argument.

Consider, too, that scientific practice accepts a distinction of disciplines, each with its own proper methods of establishing and justifying claims. Things get explained in other terms depending on what sort of question is being asked. The methods employed by various special sciences, too, differ. Although there are certain general standards imposed by the scientific method, the more specific criteria for what makes an acceptable explanation in one context rather than another differ. This suggests that not all explanation is on a par. Also, it suggests that explanation doesn't move across domains of inquiry. A sociologist will not accept an explanation of a sociological fact which refers solely to biological facts, and so on. Note, finally, that restricting our interest to contrastive explanations, following Lange's suggestion, does not change the results: if a sociological event

is not explained by some biological facts, those facts will also not be sufficient to explain why the event happened *rather than not*.[2]

Here's an objection: these examples don't show that some explanations violate *T*, only that explanations which obey *T* tend not to be given. Of course, the challenge continues, we can account for this by the simple fact that explanations involving the fundamental grounds are terribly long-winded, and nobody would have the patience or time to hear them out. Thus, strict truth is sacrificed at the altar of efficient communication, as we presuppose some general knowledge and give the listener the salient facts required for her to put the information together. But the explanation of the explanandum by the grounds of the explanans, though usually unstated, is not undermined by this argument, and these are no counter-examples to *T*. Or so the challenge alleges.

My response is as follows. We have established that the explanations involving fundamental grounds tend not to be given. From that, we can infer that these explanations are unsuccessful. An unsuccessful explanation, I argue, is no explanation at all. So, in the cases above, *T* is violated.

The explanations above are not just practically unheplful, but categorically unsuccessful. It just so happens that unhelpful explanations are not offered. One might, in a maniacally pedantic mood, be moved to talk about elementary particles when asked to explain bird migration. Our behaviors tend to adhere to the norms for efficient discourse, but they might not. But it is no contingent fact that inefficient explanations are unsuccessful. They would not achieve their intended purpose of providing new knowledge or insights about tsunamis or migrations, even if they were given. That they would fail is no mere matter of practice, but a necessary truth about their nature.

Failed explanations are not false, *per se*, but they are not true either. They are neither, because they are not, strictly speaking, explanations at all. An explanation is characterized by its specific function: to explain. Something which does not serve that function cannot properly be called an explanation. Just like a bad argument is no argument at all, or a bad excuse is no excuse at all, a bad explanation is no explanation at all. Compare: "Jones has failed to explain his actions" and "Jones has given no explanation for his actions." I take these to mean the same thing. Imagine this plea from Jones: "I agree with the first charge: I have failed to explain my actions; but I've certainly given an explanation of them!" That doesn't make sense. We take giving an explanation to be the same as succeeding in explaining. Of course, we can still call failed attempts to explain "explanations" (as I will, at times, in this paper). But we say many things without really meaning them for convenience's sake: a "fake donut" is no donut, a "failed evacuation" no evacuation, "artificial cheese" not cheese, and so on.

IV. Against the Transitivity Principle: Context-Sensitive Explanation

The following emerges from insights concerning the everyday and the specialized use of the notion of explanation: explanation succeeds only insofar as it integrates some fact or event into a more general system of facts or events. Neighbors have a different collection of background knowledge and beliefs than curious colleagues, philosophers know different things about medieval approaches to God than theologians. This, together with the fact that each case presents a different context, accounts for why each case demands a different explanation in order to be successful.[3]

This insight justifies and plausibly motivates certain arguments in favour of L-laws. Loewer has argued that L-laws "explain by unifying," while anti-Humean laws are simply declared to explain by postulation" ("Humean Supervenience" 189, 197). Miller, too, claims that at least one view of explanation takes it to be "a matter of uncovering mere patterns or regularities in reality, and then classifying particular facts as instances of these patterns" (1326). In this case, L-laws "have some explanatory force that outstrips the explanatory force attaching to even a conjunction of their instances [...] in virtue of their privileged standing in a systematization of the local Humean facts." Both of these passages mean to justify the explanatory power of L-laws. They do so by appeal to the fact that L-laws put their explananda into a well-ordered, complete system. I'm proposing that fitting a fact or event into a system is the criteria for a successful explanation. If these arguments about unification succeed, they suggest the variety view is correct.[4]

Precisely how fine-grained the contexts of explanation should be taken to be can fall out of whatever further data one wishes to draw on. For the purposes of a defender of Humean laws, only one distinction between contexts is enough: the context of metaphysics differs from the context of natural science. I think even the most maximally coarse-grained conceptions of context would likely recognize that distinction. So long as it holds, the context in which the Mosaic explains the laws (the metaphysical context) and the context in which laws explain instances (the scientific context) are different.

That distinction seems exceptionally well-motivated. Even if explanation is transitive across the contexts I discuss above—maybe particle physics does, after all, explain tsunamis, in some sense—there remains a substantial difference between that case and the case of natural laws. Explanation which is transitive across ontological categories is not shown to follow from explanation which is transitive across different kinds of entities of the same category. Paradigmatic instances of grounding which implies a further explanation—grounding obeying *T*—are within one ontological category. Neural states and electrical states, or centers of mass and relative distributions of weighted parts are all concrete things.

But I'm hard-pressed to find an instance of cross-category scientific explanation. That is, an explanation such that *C* explains *E*, where *C* is of one category, and *E* of another. Laws and instances are not of the same ontological category. Even without establishing their precise natures, it's clear that the Mosaic is spatiotemporal, whereas the laws are not, for instance. That's enough to establish that they don't belong to the same category. So a Humean might be content to reject *T* specifically in this case, without taking on the variety view I propose.

At this point, one might worry that the variety view is so permissive about what counts as an explanation (of some kind or another) that it engenders a new circularity for Humean laws. Namely, one might think that even if neither the metaphysical context, nor the scientific context features a problematic, circular explanation, there is a further context in which such an explanation *does* occur. Indeed, one might think that this further context—perhaps the context of "the metaphysics within physics"—is the context which philosophers of science are interested in.

The following seems to me to be a natural response on behalf of the variety view: not *everything* counts as a context, and furthermore not everything counts as an explanation. That is, not every gerrymandered "grab-bag" of disparate situations should count as a context, much like not every disjunction of properties counts as a property. The context which combines physics *and* metaphysics, and, with it, the variety of explanation which is appropriate for it, are far less plausible candidates for notions which are joint-carving or natural. I cannot offer a complete argument here; however, it is sufficient to say that it seems that what would count as explanatory for one thing would *not* for the other.

IV. Conclusion

I've argued that denying *T* can save L-laws from the circularity objection. I have argued that independent, theory-neutral considerations raise suspicion about *T*: it contradicts the apparently general principle that explanation is context-sensitive and variegated. With the variety view, the circularity objection is no threat, as it turns out to equivocate on two kinds of explanation. The explanation of instances by laws occurs in the context of natural science. The explanation of laws by instances occurs in the context of metaphysics. But no more general explanation follows.[5]

Notes

1. Loewer, Lange, and others use "metaphysical explanation" interchangeably with "grounding" to refer to a hyperintensional, non-causal, metaphysical relation. Although I think grounding can be explanatory, I don't think it's essentially so. To dispel the suspicion that grounding is inherently explanatory (I will go on to argue that no relation is inherently explanatory), I will use "grounding" and its cognates to refer to metaphysical explanation.

Calling the relation metaphysical explanation implies that it must, of course, explain just as much as it grounds. I don't think that's true: grounds don't always explain. I don't mean to suggest that grounding isn't explanatory *at all*. Rather, I am suggesting only that grounding, much like building, causation, or responsibility, is explanatory sometimes, but not others. If grounding is meant to be understood as essentially explanatory (i.e. explanatory in any context, as, it seems, some would like to understand it), my argument is that there is no such relation.

2. One might object as follows: there is, indeed, no privileged explanation in philosophical or social situations, but that does not license the inference that there is no privileged explanations in natural science. On the contrary, there does seem to be a privileged, more complete or appropriate explanation, a "whole story" which underpins and accounts for all of the other, less complete stories, in natural science. Specifically, the more complete or appropriate explanation is the one which invokes the fundamental grounds. Thus, in the natural sciences, the variety view is false, and if the explanans in an explanation has grounds, those grounds explain the explanandum. I see two natural responses to this objection. The first is to dispute such claims about scientific practice, and appeal to the different "incommensurate" levels of explanation in natural science. The second is to reject the specifically scientific sort of explanation as paradigmatic. To adopt scientific explanation as the sole or best kind of explanation that there is to fail to see the big picture of what we do when we explain things. Here is how I see the big picture: explaining is answering questions and integrating facts into a system of knowledge, but there is no one system of facts which is the system into which everything must be integrated. If this is correct, explanation in the natural sciences has no bearing on explanation in other areas, including the area concerned with the nature of laws, and the objection fails.

3. The view I recommend seems to follow from the picture of explanation endorsed by Hicks and van Elswyk: "explanations are sets of statements that answer questions about why something is such and so" ("Humean Laws" 438). Given the plausible assumption that what it takes to answer a question varies with the context in which it is asked, Hicks and van Elswyk are committed to the claim that the conditions on successful explanation vary with context.

4. Loewer (1996) adds the further allegation that non-Humean laws fail to explain. If "unification" is understood as I suggest, this further charge is dubious. It's not true that the non-Humean laws account resists systematization into a bigger framework. The charge is strong insofar as there is reason to doubt a thorough, systematic theory of grounding. If one were to ignore philosophical work on grounding, truth-making, determination, and the like, non-Humean views *would* be based on a relation between the laws and the way that the world is altogether unlike any other relation around. As such, they would fail to fit into any more general framework of knowledge. But many people think that there is a serious theory of grounding, truth-making, or the like. So non-Humean laws succeed in unifying: they integrate the laws of nature into a metaphysical theory. Another way to put this point is that the A-laws are explanatory in the context of metaphysics only.

5. I am grateful that this paper has benefitted from comments from Mark Heller, Jacob Mills, Kim Frost, as well as audiences at the New Mexico-Texas Philosophical Society's 2018 Conference, and the Central European University's "Laws of Nature"

summer class.

WORKS CITED

Armstrong, David. *What Is a Law of Nature?* Cambridge: Cambridge University Press, 1983.

Dretske, Fred. "Laws of Nature," *Philosophy of Science*, vol 45, 1977, pp. 173-181.

Fodor, Jerry. "Special Science, or, the Disunity of Science as a Working Hypothesis." *Synthese* vol 28, 1974, pp. 77-115.

Hicks, Michael Townsen and Peter van Elswyk. "Humean Laws and Circular Explanation," *Philosophical Studies* vol. 172, 2015, pp. 433-443.

Lange, Marc. "Grounding, Scientific Explanation, and Humean Laws," *Philosophical Studies*, vol. 164, 2013, pp. 255-261.

———. "Transitivity, Self-Explanation, and the Circularity Argument against Humean Accounts of Natural Law." *Synthese* vol. 195, 2018, pp. 1337-1353.

Lewis, David. "New Work for a Theory of Universals," *Australasian Journal of Philosophy* vol. 61, 1983, pp. 343-377.

———. *Philosophical Papers*, Vol. II. New York: Oxford University Press, 1986.

Loewer, Barry. "Humean Supervenience," *Philosophical Topics* vol. 24, 1996, pp. 101-126.

———. "Two Accounts of Laws and Time," *Philosophical Studies* vol. 160, 2012, pp. 115-137.

Maudlin, Tim. *The Metaphysics within Physics*, Oxford: Oxford University Press, 2007.

Miller, Elizabeth. "Humean Scientific Explanation," *Philosophical Studies* vol. 172, 2015, pp. 1311-1332.

Tooley, Michael. "The Nature of Laws," *Canadian Journal of Philosophy*, vol. 7, 1977, pp. 667-698.