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WHAT IS THE SIGNIFICANCE OF THE INTUITION THAT LAWS OF NATURE GOVERN?¹

Susan Schneider

Recently, proponents of Humean Supervenience have challenged the plausibility of the intuition that the laws of nature ‘govern’, or guide, the evolution of events in the universe. Certain influential thought experiments authored by John Carroll, Michael Tooley, and others, rely strongly on such intuitions. These thought experiments are generally regarded as playing a central role in the lawhood debate, suggesting that the Mill-Ramsey-Lewis view of the laws of nature, and the related doctrine of the Humean Supervenience of laws, are false. In this paper, I take on these recent challenges, arguing that the intuition that the laws govern should be taken seriously. Still, I find the recent discussions insightful, in certain ways. Employing some ideas from one of the critics (Barry Loewer), I draw some non-standard conclusions about the significance of the thought experiments to the lawhood debate.

Within the debate over the nature of laws, proponents of the doctrine of Humean Supervenience have been trying hard to discredit the anti-Humean intuition that the laws of nature govern, or guide, the evolution of events in the universe.² Such intuitions motivate an ontological picture according to which laws are basic entities, rather than ones that merely supervene upon the spatiotemporal configuration of non-nomic properties. As the Humeans are well-aware, if the intuitions are on the right track, then there is something flawed in the Humean picture.

But the Humean doesn’t think this is the case. Indeed, recently, Humeans have challenged a group of influential thought experiments, authored by John Carroll, Michael Tooley, and others, which are widely regarded as playing a key role in the lawhood debate. (For the examples and discussion see (inter alia) Tooley [1977], Carroll [1997; forthcoming], Earman [1984], Menzies [1993].) The following example [Earman 1964] is a characteristic

¹Thanks to Helen Beebe, John Carroll, Maurice Goldsmith, John Hawthorne, Michael Heumer, Barry Loewer, Tim Maudlin, Barry Ward, and to two anonymous reviewers at this journal, for valuable written comments and/or discussion on earlier drafts of this paper. Thanks also to audiences at Rutgers University and the Eastern APA for helpful discussions on an earlier draft of this paper. And thanks to John Roberts for his interesting response at the APA meeting.

²By ‘anti-Humean’ I mean the class of views that regard laws, or at least some sort of necessitation relation, as being ontologically basic. The critics that I am speaking of are Helen Beebe [2000], Barry Loewer [1996], and John Roberts [1998].

but simple member of the class of thought experiments: suppose that w is a world that has only a single particle moving at a uniform velocity. The events at w are compatible with Newton's laws. And indeed, it seems possible that Newton's laws are the laws at w . If correct, this conclusion constitutes a serious challenge to the doctrine of Humean Supervenience and to the related Mill-Ramsey-Lewis view (MRL) of the laws of nature. According to the MRL account, laws are the regularities described by the generalizations entailed by the theories (or theory) of that world that exemplifies the best combination of strength and simplicity.³ The problem is that the MRL account cannot say that it is possible that Newton's laws are the laws at w because Newton's laws are more complicated and not more informative than the single law that all particles move at uniform velocity. Other examples are more complex, but by and large, they present the same sort of challenge to the Humean/MRL picture.⁴

In response to this sort of challenge, the Humeans have offered three distinct sorts of replies: first, they claim that the intuitions are not really important to the lawhood debate, because they are precisely the sort of intuitions that the Humean would reject [Roberts 1998; Beebe 2000; Loewer 1996]. Second, they argue that the intuitions that the laws govern arise from dubious sources [Beebe 2000; Loewer 1996; Roberts (in conversation)]. And third, they argue that even if, in the worst case scenario, the intuitions are a strike against Humeanism; on balance, to quote John Roberts, 'Humean Supervenience has theoretical advantages that trump the intuitions it offends against' [Roberts 1998: 428; Loewer 1996: 116].

Do any of these strategies succeed? To the best of my knowledge, there has been no critical discussion of this new wave of Humean attacks in the literature. Yet it is important to assess whether the replies work, and deeper yet, to determine whether any of the arguments raised might be strengthened, by further work, to present a robust response to the intuition that the laws govern.

Herein, I argue that the anti-Humean position withstands this line of attacks: the thought experiments are an important challenge to the doctrine that the laws supervene on non-nomic matters of fact (herein 'HSL') and the related MRL account of laws. Still, I do conclude that the third criticism, offered primarily by Barry Loewer, offers an important insight about the dialectical status of the intuitions to the lawhood debate: the original thought experiments, even if they illustrate that Humeanism is unintuitive, do not, by themselves, show that Humean Supervenience is false. Instead, they are one strike against HSL that is to be weighed against the Humean in

³According to David Lewis's well-known version of MRL, a theory is strong to the extent that it entails many particular facts and simple when it can be formulated using only a few basic principles. In the case of a tie between systems, the laws are whichever axioms and theorems appear in all the tied systems. For further discussion see Lewis [1994].

⁴The topic of objective chance has also provided the anti-Humean with an excellent source of examples. For instance, we can imagine two worlds w_1 and w_2 each of which having independent repetitions of an experiment of kind K with outcomes y and n . But in w_1 the chance on each trial of K resulting in y is .5 while in w_2 the chance of K resulting in y is .6 and yet the two worlds contain exactly the same sequences of y s and n s. If the worlds contain nothing else then the chances fail to supervene on the occurrent facts. Indeed, the anti-Humean can say that the entire categorical history of our world is metaphysically compatible with numerous distinct hypotheses about the objective chances. (Thanks to Barry Loewer for the example.) For an extension of the Mirror Argument to the case of chance see Carroll [1997].

a larger, all-things-considered judgement. Nonetheless, despite its insightfulness, I argue against Loewer's claim that the all-things considered judgement is ultimately in favour of the Humean.

I've emphasized that the controversy over the intuitions that laws govern is important to the debate over the nature of laws; but it is of course crucial to explain why. Perhaps the greatest motivating factor behind the resistance to Humeanism is a general, deeply rooted suspicion about the seemingly impoverished nature of the Humean reductive base. The Humean's fundamental ontology consists in a mosaic of properties and relations, all of which are supposed to be non-nomic in nature. Behind the thought experiments is the view that the Humean's ontological furniture is simply too impoverished to do the needed philosophical work of determining all that there is. For the Humean cannot determine what the laws are. If the intuitions behind the thought experiments are correct, there must be something else that is ontologically basic which accounts for the intuitions behind the thought experiments, be it irreducibly nomic properties (Shoemaker), primitive laws (Carroll, Maudlin), or perhaps non-nomic properties together with a necessitation relation (e.g., Armstrong). A supervenience base that is simply a mosaic of non-nomic property tokens across spacetime just couldn't account for all that there is.

Are such suspicions warranted? They might be, if the intuition that there is more, ontologically, to laws than simply a mosaic of non-nomic categorical properties survives philosophical scrutiny. Thus, determining if the intuition that laws govern is on the right track might play an important role in settling the debate over Humeanism. This being emphasized, let us turn to the first Humean attack on the intuitions.

I. Are the Intuitions Negotiable?

I suspect that many, if not all, Humeans believe that the intuitions that the laws govern are, in some important sense, entirely negotiable. In print, the arguments for this view are articulated against the backdrop of what many would likely say is the most influential anti-Humean thought experiment. This is an argument developed by John Carroll, called 'The Mirror Argument' [Carroll 1997: 61–2].

The argument begins with a possible world, U1, that consists of five X-particles and five Y-fields. When each particle enters its Y-field it acquires spin up. All of the particles move in a straight line for all of eternity. But close to the route of one particle there is a mirror on a swivel. (Call this particle 'particle b'.) The mirror is in such a position (call it 'position c') that it does not get in the way of the trajectory of particle b. It seems plausible that the following is a law in U1:

- (L) All X-particles subject to Y-fields have spin up.

Now consider U2, a world that is just like U1 except that particle b does not acquire spin up upon entering the Y-field. Hence, L is not true at U2. Now,

U1 and U2 do not pose a problem for the MRL view because the worlds differ in their particular matters of fact. The problem stems from considering what would have occurred in each of the worlds had the mirror been in position *d*, stopping particle *b* from entering the field. Consider the nearest possible world to U1, U1*; here, it seems reasonable to say that *L* is a law because the worlds only differ in that the mirror blocks the particle from entering the field [Carroll 1997: 61–2]. Now consider the closest world to U2, U2*, where the mirror blocks the particle. It seems that although *L* is true in U2* it is an accident because had the mirror not been in the way *L* would be false. U1* and U2* are identical in their particular matters of fact; yet it seems that *L* is a law at U1* but not at U2*. Hence, laws do not supervene on particular matters of fact.

Because U1* and U2* are isomorphic in their particular matters of fact the Humean must claim, counterintuitively, that the laws are the same. So the Humean must say, for one of these worlds, that moving the mirror changes what the laws are: either moving the mirror in U1* results in *L* not being a law or moving the mirror in U2* results in *L* being a law. I see no principled reason for choosing one of these options over the other. In any case, as Carroll notes, both of these options are counterintuitive.

Now, the Humean response, which I've called 'The Negotiability Reply', actually has two versions, a simple one and a complex one. The simple one embodies an increasingly common Humean reaction to the Mirror Argument; one which is voiced with respect to the thought experiments more generally. In this simple response, the Humean just retorts that any counterintuitiveness is not a strike against Humeanism, for such intuitions presuppose an anti-Humean vantage point. Helen Beebe offers this sort of response to the Mirror Argument. She writes:

As a friend of supervenience, I have no desire to find a way of grounding the 'fact' that *L* is a law in U1*, but not in U2*, since I think *L* is a law in U2* and not an accident. This commits me to the apparently unacceptable claim that the position of the mirror in U2 affects what the laws of nature are, since I am committed to the truth of the counterfactual 'if the mirror had been in position *d*, *L* would have been a law.' But I truly see no harm in that . . . As I said earlier, part of the Humean creed is that laws of nature depend on particular matters of fact and not the other way around; it is no surprise to the Humean, then, that by counterfactually supposing the particular matters of fact to be different one might easily change what the laws of nature are too.

The intuition that's really doing the work in this counterexample, then, is the intuition that laws are not purely descriptive. . . . But to describe the example in those terms is not to describe it in neutral terms but to describe it in terms which explicitly presuppose an anti-Humean starting point.

[Beebe 2000: 580]

At first blush at least, it is clear why the Humean would feel compelled to assert this. After all, there is a sense in which they are being told that their view is false simply because it doesn't say the laws govern. The Humean thinks the anti-Humean position is in the grip of an intuition which is

ultimately incorrect. However, upon further reflection, this line of reasoning is off the mark. It is not simply that both the Humean and the anti-Humean fail to accommodate the opposing side's intuition about lawhood. The issue is not so egalitarian. The anti-Humean's point is that one view is in tandem with our ordinary, commonsense conception of lawhood while the other view runs counter to it. Now, the critic would like to respond to this point then she would need to call into question the following rule of thumb that is summoned (at least implicitly) so often by analytic philosophers:

- (C) *Ceteris paribus*, choose the philosophical theory of F that best accommodates our (relevant) pretheoretic intuitions about F.

However, to the best of my knowledge, the critics have not attempted to challenge this principle. But without providing a compelling case against (C), the reply is without substance.

But in the spirit of trying to improve upon the Negotiability Reply, let us consider the following rationale for rejecting (C). (C) should not be followed because, in general, our pretheoretical intuitions about a target concept serve to point at the concept to be studied, but not to identify features which are essential to it.⁵ As an anonymous reviewer explains, 'while a philosophical theory of F that cleaves closely to our pretheoretic intuitions about F might succeed at elucidating our ordinary concept of F, it is not in general clear why such success should matter to anyone but a semanticist'. Instead, the intuitions, 'serve as clues to what philosophically (and perhaps scientifically) interesting concepts might be found'. This approach to intuitions does give intuitions a significant methodological role—they serve to identify a starting point—but, 'without offering any support to (C)—even with the "*ceteris paribus*" qualification'.⁶

I have a few worries about this line of thought. Discarding (C) amounts to saying that, aside from serving to identify a concept for initial investigation, the presence of intuitions are insignificant. This may hold for certain scientific contexts, but I suspect it should not hold for the case of laws. Of course, I agree with the observation that ordinary intuitions can serve to identify a target concept. And often, in the course of philosophical investigations, it is found that a revision of the original concept is in order. But, in general, a conceptual revision has to be well-motivated, and any move away from the target concept needs to be carefully justified. Now, in the case of lawhood, in addition to laypeople, two important communities seem impressed by the intuitions: (i), many philosophers, even those who are advocates of Humeanism, admit that they have intuitions about the examples; (ii) second, as I explain in the following section, the view that laws govern seems closely connected to physics. (See also Loewer [1996], Maudlin [2007].) So this is not a case in which the ordinary intuitions depart from the more 'seasoned' views of those who consider the issue; that is, the relevant philosophical or scientific communities. In light of this, a justification of any

⁵A different strategy is to acknowledge (C) but argue that the *ceteris* are not *paribus*. This is the approach taken by Barry Loewer in his *On Balance Reply*, which will be discussed in Section III.

⁶The reviewer does not seem to fully sympathize with this objection, however.

conceptual revision seems particularly important in the context of the lawhood debate.

In general, any justification of a conceptual revision seems to involve at least two dimensions. First, one must show that there are significant theoretical advantages to be had by adopting a theory that departs from the original concept. In the present context, this would involve the Humean successfully arguing that Humeanism has greater theoretical utility than competing views of lawhood. Second, the proponent of the revisionary account must explain away the original intuitions. Presumably it is unimpressive to merely ignore them—if many (if not all) philosophers have them, then a plausible theory is responsible for explaining why so many are in error.⁷ If the revisionary position succeeds in both of these tasks then the deviation from the original concept is well-motivated. But throwing out (C) seems tantamount to saying that this common practice—that is, the practice of requiring careful justification for any conceptual revision—should be thrown out.⁸

In sum, the Simple Negotiability reply, as it stands, is weak. What is needed is a solid justification for rejecting (C), yet, at this point, it is unclear how to go about this. So let us press on. In a more complex version of the Negotiability Reply, John Roberts [1998] argues that one is not compelled to accept the anti-Humean results of the Mirror Argument. For the argument requires a notion of physical possibility that the Humean would reject.

Physical Possibility

Recall that the anti-Humean notion of physical possibility is the following:

P is physically possible in W iff there is a world having exactly the same laws as W, in which P is true.

But, as Roberts observes [1998: 428], the Humean has to reject this. Because, on the Humean view, the slightest change may result in radically different laws, events which intuitively seem possible (e.g., ‘Tom might have tripped over the step’) would turn out to not be so, because the possible world in which Tom tripped is one with different laws than the actual world. Instead, the Humean appeals to the following view of physical possibility:

P is physically possible in world W iff P is logically consistent with the truth of all the laws of nature in W.

⁷Loewer tries to argue that Humeanism has greater theoretical utility (see Section III for some discussion). As mentioned, Beebe [2000] tries to explain away the intuitions; this is the topic of Section II.

⁸A different way to discredit (C) would be to appeal to the recent wave of influential criticisms of epistemological intuitions generated by Steve Stich and numerous coauthors. See, e.g., Nichols, Stich and Weinberg [2003]; Weinberg, Nichols, and Stich [2001]. However, it is still unclear whether this body of work will succeed in undermining (C). The chief focus for Stich and his coauthors is intuitions involving epistemological concepts like knowledge and scepticism. The issues addressed clearly bear on the general topic of philosophical intuitions, but Stich et al. also face important methodological questions about what their results actually prove. (See Sosa [forthcoming].) Assuming these methodological questions can be put to rest, it might be interesting for the Humean to find out if there are different intuitions about whether laws govern between groups with different cultural, educational or socio-economic backgrounds.

Unfortunately, Roberts's reply faces the following problem. Contra Roberts's claim, the Mirror Argument *does not* require an anti-Humean notion of physical possibility. Or more specifically, the original version of the Mirror Argument (the one commonly discussed and which is provided above) does not, although what John Carroll calls a 'more formal version' does. Let me explain. In Carroll's discussion of the Mirror Argument, two versions of the Mirror Argument are provided, a 'more formal one' which Carroll says requires an appeal to a principle that invokes an anti-Humean notion of physical possibility, which Carroll calls 'SC', and one that he says does not [Carroll 1997; Roberts 1998]. According to Carroll, (SC) is a principle which says that a counterfactual conditional is true if its antecedent is physically possible and physically necessitates the consequent. Put a bit more formally:

(SC) If $\diamond_p P$ & $\Box_p(P \rightarrow Q)$, then $(P \Box \rightarrow Q)$

where ' $\Box \rightarrow$ ' is the counterfactual conditional, ' \rightarrow ' is the material conditional, and ' \diamond_p ' indicates physical possibility or physical necessity. (For further discussion of (SC) see Carroll [1997: 182–9].)

To see that the original version of the Mirror Argument does not require a premise about physical possibility, notice that the commonsense reason why the Mirror Argument seems compelling is, as Carroll underscores, merely that changing the location of the mirror is not sufficient to change whether L is a law. As Carroll observes,

To get that mirror to that spot, some laws of motion or energy conservation may have been violated, but presumably not L. . . . Given the way that U1 happens to be laid out, what could that law have to do with the position of the mirror?

[Carroll 1997: 189]

This judgement doesn't involve (SC) at all. But let me illustrate, in a bit more detail, that (SC) is not appealed to to obtain the judgement that the laws are the same in U1 and U1* (and U2 and U2*). A nice way to illustrate this is to see what *is* appealed to. For consider the point in which one judges that in U1*, a world in which the only difference in world history is that a mirror blocks the movement of the particle, L is still a law. In making such a judgement, we are considering that relative to U1, there is a world that only departs in world history from U1 in one, rather minor sense: the mirror blocks the motion of the particle. Surely, (we think) the laws must stay the same. For after all, such a slight difference in the location of a mirror is not enough to make for a difference in what the laws are. Now, notice that we've said nothing that requires a particular sort of physical possibility, rather than another. Indeed, we've said *nothing* about physical possibility thus far. But it seems that the anti-Humean judgement is already in place. For once a similar judgement is in hand concerning U2*, that is, that the laws are the same as U2, we have two worlds, U1* and U2*, which are the same with respect to non-nomic matters of fact, that differ in their laws. In sum, the intuition that is doing the work is not (SC), but merely the intuition that changing the location of the mirror doesn't change the laws. Thus, (SC) is

not employed in a version of the Mirror Argument, and the laws still seem to differ in the respective worlds. It seems then, that the less formal argument, which does not appeal to (SC), still poses a threat to Humean Supervenience and MRL.⁹

One might wonder if Roberts's reply is effective against the formal version, however. Before delving into this issue, a quick observation. Since it would not impact the informal version, and this is the version that has proven to be influential in the anti-Humean literature, the importance of a successful reply to the formal version is minimal.

This being said, I do not think Roberts's point improves the dialectical situation for the Humean whatsoever; for it just calls attention to issues that require further defence by the Humean. As noted, Roberts claims that our intuitions about physical possibility, just like our intuitions about laws, are negotiable. However, I believe that the Humean notion of physical possibility fails to neutralize the opposing view of physical possibility. For one could just say that just as with the Humean notion of laws, the notion of physical possibility that the Humean has in mind is counterintuitive. In particular, it runs contrary to the manner in which laws are regarded in physics.

Recently, Tim Maudlin has argued that contemporary practice in physics not only makes heavy use of talk of laws of nature, but, quite significantly, it *precludes* a Humean account of laws. As Maudlin explains, physicists seem to conceive of physical possibility in terms of models of physical laws. Every model of a set of laws is one possible way that a world governed by such laws can be. For instance, 'Cosmologists... regard both open and closed universes as physically possible, and study the features of each. How they manage this is relatively clear: they have the field equations of General Relativity, and regard the physically possible universes as models of the laws' [Maudlin 2007].

This conception of physical possibility tracks the anti-Humean notion of physical possibility. But if this is correct, then the notion of physical possibility that Roberts, and Humeans more generally, appeal to, actually runs *contrary* to the notion of physical possibility in physics. This emphasizes the counterintuitiveness of the Humean conception of physical possibility. So unless Roberts is able to respond effectively to this point, his appeal to physical possibility to buttress his version of the Negotiability Reply does not help.

Further, Roberts's appeal to physical possibility actually seems to make matters worse for the Humean, for it seems to undercut the original motivation for advocating the Humean supervenience in the first place. As is well known, David Lewis advanced Humean Supervenience as a means to 'resist philosophical arguments that there are more things in heaven and Earth than physics has dreamt of' [Lewis 1994: 475] In general, Lewis left one with the impression that HSL is well motivated by physical practice; the anti-Humean line, in comparison, was seen as appealing to entities that were not scientifically kosher. But HSL is not only *unmotivated* by practice in

⁹In her paper Beebe offers a response to the Formal Argument that is much like Roberts. (Further, she is explicit in separating the original from the more formal version). My response is essentially the same as to Roberts.

physics, it *runs contrary* to it. So I do not think that Roberts's attempt to articulate a Negotiability Reply in terms of physical possibility helps the Humean. For the Humean notion of physical possibility runs contrary to the commonsense conception of physical possibility in physics. And further, it seems to undercut a very central motivation for HSL.

An Outline of a New Humean Response to the Mirror Argument

Thus far, the attempts by Humeans to diminish the dialectical force of the intuition that the laws govern have mainly focused on the Mirror Argument. Our subsequent discussion will leave the Mirror Argument, turning to general considerations that are supposed to show that the governance intuition arises from dubious sources (Section II), and that further, even if the intuition does not arise from dubious sources, on balance, Humeanism has more theoretical virtues than the competitors (Section III). But before moving to these issues, I'd like to raise some special issues that arise with respect to the governance intuitions that are presumably behind the Mirror Argument. As I mentioned above, a key intuition in the context of the Mirror Argument seems to be that a slight difference in the location of the mirror is not enough to make for a difference in what the laws are. Or, put more generally:

- (i) What the laws at a world are is stable under minor counterfactual differences in boundary conditions.

In contrast to (i), to the best of my knowledge, the Mirror Argument has been treated as relying on the following intuition, (or at least pumping the intuition behind it):

- (ii) The laws govern or guide the evolution of events at a world.

And the related view that,

- (iii) The laws do not supervene on non-nomic facts

(where it is plausible that (ii) implies (iii)). However, the Mirror Argument seems to pump (i). And it seems to rely on (i) as a step to (ii) and to the conclusion, (iii), that the laws do not supervene.

Why call attention to this? Well, the fact that (i) might be a key step to (iii) would not be of great significance unless the Humean could somehow show that (i) could be satisfied by a Humean account. Then, the conclusion that the laws do not supervene would not follow. And indeed, consider the following suggestion (by an anonymous reviewer):

a Humean can easily design an account of laws that accommodates (i). It's true that the standard MRL accounts *don't*; but that is because they (bizarrely) automatically count one system as 'stronger', in the relevant sense, if it is

logically more restrictive than another—and one way to become more restrictive is to reduce the space of possible boundary conditions. To the extent that the MRL account is meant to be incorporating criteria central to the practice of science (physics in particular, presumably), that seems a mistake: as Earman pointed out some time ago, the notion of ‘strength’ that matters to physics has as its perfect exemplar *deterministic* theories. No *additional* strength—in the relevant sense—is achieved by restricting the boundary conditions of such a theory.

This is indeed food for thought. Of course, whether (i) can be satisfied by an alternative MRL account will be trivial unless the proposed alternative MRL view can stand on its own as a competitor to the standard view. And this will depend on larger issues, such as how it fares with respect to the objections arising for MRL (mind dependence, etc.) and whether it invites any new ones. This awaits further elaboration and defence of the view.¹⁰ However, even if this new approach succeeds, the Humean would still be saddled with the anti-Humean result of other thought experiments. For the suggestion only provides a response to examples that have the structure of the Mirror Argument, because these uniquely involve intuitions about nearest possible worlds that involve minor counterfactual variations.

The anti-Humean might further say that the new MRL view may get the right result in the Mirror Argument case, namely, that the laws do not change in the nearby worlds, but for the wrong reason—the intuition that pumps (i) is the intuition that the laws govern. But this would require further argumentation, for although the intuition that laws govern is generally regarded as being involved in the Mirror Argument, it is not clear that this alone is fuelling (i). Instead, it may be that (i) is fuelling (ii).

So I look forward to further debate on this issue. But for now, let us turn to a different Humean tactic. In addition to offering two versions of the Negotiability Reply, Humeans commonly suggest that the intuitions themselves may mislead us, because they stem from dubious sources in ordinary language. Let us try to determine if this sort of reply has substance.

II. Do The Intuitions Arise From Dubious Sources?

This sort of criticism begins by looking at the origins of our ordinary concept of a law of nature, and then claims that upon reflection, the intuition that laws govern stems from unreliable sources.¹¹ Helen Beebe [2000: 571] has developed such an argument in detail. Her argument begins by taking the proponent of the thought experiments to be claiming that it is a conceptual truth that laws govern. And indeed, this is what these authors

¹⁰The reviewer offers an intriguing start: ‘An MRL account that properly attended to this point might proceed as follows: First, let each candidate system consist of two hypotheses: an hypothesis about the boundary conditions, and an hypothesis about the dynamics of complete physical states. One desideratum is that the second of these be as simple and strong as possible—where “strength” is measured (somehow) by the extent to which the dynamical hypothesis approximates determinism. But a second desideratum is that the first of these hypotheses—the boundary conditions hypothesis—be as weak as possible (i.e., accommodate a wide a range of possible boundary conditions)’. See also Earman [1986].

¹¹Roberts and Loewer also seem to share Beebe’s suspicions (from conversation); but I will confine my discussion to Beebe as she has a detailed view in print.

seem to be doing.¹² That is, they seem to think that the notion of governance is a key part of the concept of a law of nature, and that any theory that fails to provide a sense in which laws govern cannot provide a suitable theory of laws. She then contends that if it is indeed a conceptual truth that laws govern, then it must be so because the sort of governance that is attributed to laws is present in our ordinary language notion of a law. So, she asks: is there an ordinary sense in which laws are said to govern? [ibid.: 577]. She suggests two possible senses. First, laws may govern when there is a divine lawgiver or more generally, 'some being, institution or other authority whose decrees constitute the laws of the land, the rules of cricket, or whatever' [ibid.: 575]. Second, laws may govern in the way that moral laws govern; they govern by having some sort of prescriptive jurisdiction over us [ibid.: 576]. Beebe then contends that neither of these types of governance apply to the case of laws of nature. Concerning the first type she writes, 'I take it to be just plainly true that belief in laws of nature does not conceptually presuppose belief in a divine lawgiver' [ibid.]. Turning to the second type, she observes that moral laws govern in the sense that they dictate how agents *should* behave. They can be violated. Laws of nature, on the other hand, cannot be broken. For this reason, 'laws of nature are unsuited to being cast in a way that is analogous to the prescriptive nature of other laws' [ibid.]. Having discarded what she believes are the only options, she then concludes that we lack justification for the view that it is a conceptual truth that the laws govern. Hence, she concludes, the thought experiments do not threaten the MRL view.

I believe that this sort of reply is on the wrong track. I will begin with a response to Beebe's argument, in particular, and then make some general comments about the value of attempts to dismantle the intuition based on the origins of the ordinary concept(s) of natural law. To speak to the above argument, the problem is that the two options are not exhaustive. As is common knowledge, the view of governance that the anti-Humeans have in mind is the following: once the initial conditions and the laws are set at a world, the subsequent history will evolve under the direction of the laws [Carroll 1990; 1994; Loewer 1996]. Now, the Humean might suspect that this putative third sense of governance really gains its intuitiveness from the case of divine governance. Admittedly, anti-Humeans about laws frequently illustrate the notion of governance that they have in mind by asking us to imagine that God creates the universe by setting the laws and the initial conditions. God is then said to 'let' history evolve under the direction of the laws. The Humean might contend that this manner of illustration indicates that the third sense of governance borrows its plausibility from the case of divine governance. So once the talk of God setting up the world is given up, the anti-Humean position will lose its intuitive pull.

This claim is flawed, however. It is important to notice that the mere fact that a metaphysical theory speaks of God 'setting up a world' to illustrate its position does not show that the appeal of the ontological primitive in

¹²In the final sections, I observe that the view that it is a conceptual truth that the laws govern need not be maintained by the anti-Humean. For now, let us suppose it is correct.

question ultimately derives from the notion of divine law. Appeals to a divine force, setting up ontological shop, occur throughout the metaphysics literature, being employed in motivating views that clearly do not depend, for their plausibility, upon the notion of a divine lawgiver.¹³ Indeed, even Beebee tries to fire the imagination of her readers by using an example involving God. She does so in giving an initial first pass at the Mill-Ramsey-Lewis view. She writes,

Suppose God wanted us to learn all the facts there are to be learned. . . . He decides to give us a book—God’s Big book of Facts—so that we might come to learn its contents and thereby learn every particular matter of fact there is. . . . As a first draft, God just lists all the particular matters of fact there are. But the first draft turns out to be an impossibly long and unwieldy manuscript. . . . Luckily, however. . . . God has a way of making the list rather more comprehensible to our feeble, finite minds: he can axiomatize the list. . . . God, in his benevolence, wants the list of particular matters of fact to be as short as possible—that is, he wants the axioms to be as strong as possible; but he also wants the list of axioms to be as short as possible—he wants the deductive system (the axioms and theorems) to be as simple as possible.

[Beebee 2000: 573]

Now, I’m sure Beebee would agree that Humean laws do not covertly borrow their plausibility from the case of a divine lawgiver (or in the Humean case, I suppose it is more appropriate to think of a divine mosaic builder—a divine legislator who determines the configuration of Humean properties at a world and thereby determines the laws). Surely, we can accept her illustration without conferring plausibility on the MRL-laws based on a mistaken association with the view that God bears ultimate ontological responsibility for the configuration of the Humean mosaic—the use of these illustrations is really quite innocent. The common pattern behind the uses of illustrations involving God—I suggest—is simply an interest in employing metaphors of an omnipotent and/or omniscient being to fire the imagination concerning a particular view of metaphysical determination. So let us set aside the fact that the anti-Humean frequently explains her position by employing God metaphors; this fact alone does not show that the intuitiveness of the notion that laws govern depends on the notion of a divine lawgiver.

However, even if the use of God metaphors is put aside, one may still suspect that the notion that the laws govern may be deriving its plausibility from these other, more familiar cases of governance.¹⁴ However, introspection does not seem to support the view that either of these sorts of governance fuel the thought experiments. Consider, again, the simple

¹³For example, see the following: Crane [1991]; Kripke [1980].

¹⁴It likely that Beebee would respond that although the anti-Humeans do not literally mean that laws govern in the sense that there is a lawgiver, the notion of governance that they employ covertly depends on the notion of divine or moral legislation because historically speaking, our talk about laws originated by way of talk of moral or divine law. But even if there is a historical connection, it is far from clear that the Anti-Humean or even the layperson has a notion of law that *depends* on such an association. For we frequently use expressions without thinking of, or even having memories of, their historical origins (e.g., consider our use of the term ‘breakfast’, a term which apparently originated in the practice of breaking a fast).

thought experiment that was raised in the introduction. Let us ask: why does it seem sensible that there is a world in which Newton's laws are the laws? Reflection reveals that it is not because we are at heart theists or are thinking of moral laws, but simply because our intuitions about possibility seem to envision laws as being robust, non-descriptive entities. We have strongly anti-Humean intuitions in such cases simply because laws seem to be ontologically basic.

Of course, I suppose that we could be radically in error that this anti-Humean intuition is independent from the other two senses of governance. Perhaps our belief that our judgement about the example does not gain its plausibility from the notion of a divine legislator is misleading. This is possible, but Beebe has given us no reason to believe that we are in error. Surely it is required that there be compelling reason to deny what seems apparent to us. Why would we believe, on the one hand, that this intuition is independent of the other two, yet be so radically in error? The upshot—this intuition seems compelling independently of a prescriptive or divine sense of governance, and Beebe has failed to prove that our belief that the senses are distinct is erroneous. I conclude that Beebe has failed to dismantle the governance intuitions.

Now, some general observations about replies that seek to undercut the intuition that the laws govern by looking at the origins of the expression 'natural law', and related expressions. Let us suppose that somehow, such expressions were tied to the wrong sense of governance. Does this mean the intuition that laws govern is false? It is not so clear. I have a number of observations.

First, what precisely does it mean to say that our uses of expressions like 'laws of nature' are tied to the wrong sense of governance? Is this a historical claim? This seems to be the most natural interpretation. But why would that ultimately mean that some historical, linguistic, connection is the *current* motivation for philosophers to think that laws govern? After all, we often employ expressions that have some origin or historical use that is entirely unfamiliar to us. Even if there is some historical connection to the wrong sort of governance, the reason that laws seem to govern may simply be based on our own metaphysical intuitions, which may have nothing to do with this historical connection.

On the other hand, perhaps the idea is instead that the expression 'laws of nature' is currently (not just historically) tied to the wrong use of governance. If so, it is far from clear that this tie is the very reason why philosophers believe what they do. For our metaphysical preferences might be the very reason why the expression 'law of nature' had some linguistic connection, historical or current, to some sense in which other sorts of laws govern. Our metaphysical intuitions might have influenced our linguistic conventions; not the other way around.

Now, I am not suggesting that either of these scenarios *must* be the case, should the Humean establish a historical or contemporary linguistic connection between expressions like 'laws of nature' and some expression that names an inappropriate sort of governance. I am suggesting, rather, that merely locating such a connection does not, by itself, discredit the

intuition that the laws govern, for other scenarios are also possible. And if either of the other scenarios hold, then the intuitions ultimately may still have metaphysical force. Indeed, it may be difficult for the Humean to firmly establish her case—for after all, how could one tell which scenario would actually be correct?

But perhaps the anti-Humean could actually add an observation to lend credibility to the intuitions, even in this apparent stalemate. As noted, physicists seem to employ a notion of laws in which laws govern. It would seem very far fetched to suggest that the appeal and utility of developing different models with the same laws derives from some folk association with laws or with God. So, even if ‘laws of nature’ has a dubious linguistic connection to some other sense of governance, the intuition that laws govern may nonetheless be well-supported by physical practice.

And of course, it should be said that there is at least one other way in which the intuitions could turn out to be correct in this worst-case scenario: it may turn out that one version of the anti-Humean view may offer an ontological picture which ultimately has more philosophical advantages than the other contenders. In this case, the intuitions, even if they lack ground in ordinary language, may in fact be correct. However, it remains to be seen whether the anti-Humean view ultimately fares better than the Humean view. I actually suspect that one type of anti-Humean view does. But clearly, a case for this cannot be established in this brief paper. However, this issue does relate to the final Humean response to the thought experiments, and is thus briefly pursued below.

In an intriguing reply, Barry Loewer [1996] suggests that on balance, the Humean position has more advantages, and fewer disadvantages, than any of the anti-Humean views do. So the fact that the Humean cannot accommodate certain intuitions about governance is not, by itself, reason to reject the Humean picture. I briefly consider Loewer’s case for this view below.

III. The On-Balance Reply

The On Balance Reply, like the Negotiability replies, claims that the intuitions are negotiable. But this third reply claims that the intuitions are not to be merely neutralized by the observation that the Humeans have a different intuition. Instead, this response claims that the intuition that laws govern should enter into an all-things-considered decision about which view of lawhood is preferable. It is just that despite the fact that Humeanism cannot accommodate the intuition that laws govern, on balance, Humeanism is the better view because, ‘Humean Supervenience has theoretical advantages that trump the intuitions it offends against’ [Roberts 1998: 428].¹⁵ (In light of this point I shall call this reply the ‘On Balance Reply’).

This claim is the most well-developed by Barry Loewer, who actually lists the strengths and weaknesses of both the Humean and non-Humean

¹⁵Despite this comment, the main thrust of Roberts’s paper is along the lines of the second sort of reply. It may be that he is not intending to separate these two claims from each other. However, I think they are actually distinct sorts of responses.

positions, and argues that on balance, the Humean position is superior. Loewer argues that overall, Humean laws (hereafter 'H-laws'), fare better than any of the anti-Humean positions on laws do. Loewer begins his discussion by providing a list of our central beliefs about laws. Quoting Loewer:

- (i) If its a law that Fs are followed by Gs then it is true that Fs are followed by Gs.
- (ii) Being a law is a mind-independent property.
- (iii) The laws are important features of the world worth knowing.
- (iv) It is a goal of scientific theorizing to discover laws and we have reason to believe that some of the propositions that the fundamental sciences classify as laws are laws.
- (v) There's a difference between accidental and lawful generalizations.
- (vi) There are vacuous laws.
- (vii) Laws are contingent but ground necessities.
- (viii) Laws support counterfactuals.
- (ix) Laws explain.
- (x) Laws are confirmed by their instances.
- (xi) The success of induction depends on the existence of laws.
- (xii) The laws govern (direct, constrain, or guide) the evolution of events.
- (xiii) If it is a law that p, and q is any proposition expressing boundary conditions or initial conditions relevant to the law that are co-possible with p then it is possible that it is a law that p and q.¹⁶

[Loewer 1996: 111]

As our focus is on intuitions about governance, I will not delve into Loewer's discussion of all the items on the list. Instead, for the sake of argument, I will accept Loewer's defence that H-laws do satisfy certain controversial members. The problem with Loewer's argument is that even it is the case that H-laws satisfy these controversial members, it is not the case that the anti-Humeans satisfy fewer desiderata overall. This is because while Loewer's discussion may very well be effective against the governing law view of Armstrong, Dretske, and Tooley (hereafter ADT), it is ineffective against the primitivist conception. Armstrong, Dretske, and Tooley differ in various details, but they all adopt a reductivist view of laws because they claim that lawhood can be analysed in terms of one property's necessitating another property. Primitivism, in contrast, is anti-reductivist: it says that lawhood is primitive, without further analysis. There is nothing to say about the facts that make law propositions true. Loewer makes the following remarks about primitivism:

Carroll and Maudlin drop the metaphors of directing and guiding and simply maintain that laws fail to supervene on the Humean facts. So far as I can see there is no incoherence in their position. There are possible worlds in which some regularities instantiate a non-Humean property X and in which these regularities satisfy all of the conditions on laws with the exception of (xii).

[Loewer 1996: 119]

¹⁶Loewer borrows many items on this list from van Frassen's discussion [1991].

This is good news for primitivism. Indeed, Loewer doesn't note that primitivism satisfies (xii) as well, the desideratum that laws govern the evolution of events. For as Tim Maudlin has noted, the primitivist may accept the use of such metaphors 'to fire the imagination' [Maudlin 2007]. While these sort of metaphors are not summoned in the context of an analysis of lawhood, the primitivist can make use of them. For on the primitivist's view, 'Laws are the patterns that nature respects; to say what is physically possible is to say what the constraint of those patterns allow' [Maudlin 2007]. Returning to the issue of which account, on balance, satisfies most of the important concepts normally associated with lawhood, Loewer has not shown that primitivism fails to meet any desiderata, while he admits that HSL fails to meet (xii) and (xiii).

Now, Loewer does attempt to diminish the significance of the failure to meet (xii) and (xiii). He suggests:

The intuitions involved in the thought experiment are doubly suspicious. They involve possible situations that are enormously different from the actual world and they involve scientific concepts. The assumption that such intuitions are accurate is, at best, questionable and in some cases outright discredited. For example, most people have the intuitions that continued application of force is required to keep a body in motion and that the heavier the object the faster it falls. Obviously these intuitions are misguided. Why should intuitions concerning laws be more reliable?

[Loewer 1996: 116]

However, these suspicions can be set aside. First, while the certain examples involve worlds that are clearly different from the actual world, there are plenty of cases involving the actual world; in general, such examples involve the intuition that the laws may be more complex and not more informative than the 'laws' as identified by MRL. As John Carroll puts it, 'The lawfulness of *our* laws can seem like something the course of events does not determine' [Carroll 2005: 7].¹⁷ Second, force is not a philosophical concept; instead, it is defined by physical theory. Laws, on the other hand, depend on philosophical theorizing, together with scientific and pretheoretical views on the nature of laws. Indeed, the failure of Humeanism to satisfy (xiii) is of concern to the physicist as well, as Loewer himself notes.¹⁸ It is thus quite unlike the case of force.

So I believe that Loewer's reply does not, as of yet, support the conclusion that HSL is the best overall view. However, as I will now explain, I do find that the basic dialectical strategy that Loewer employs to be insightful. I close with some remarks on this issue.

¹⁷Carroll provides two such examples [2005: 7].

¹⁸Loewer notes: 'The failure of L-laws to satisfy (xiii) is prima facie a serious matter. Given a set of dynamical laws physicists consider the consequences of those laws for various initial conditions. No restriction is placed on these conditions other than that they are compatible with the generalizations expressed by the laws' [Loewer 1996: 115].

IV. Conclusion

We've considered a recent trend in the literature on laws towards calling into question the credibility or dialectical importance of the anti-Humean intuition that the laws govern. Although I've argued against the various reasons for doing so, I believe that the critics' general aim—to take a critical look at the intuitions that the laws govern and their significance to the lawhood debate—is apt. After all, such intuitions are doing a good deal of philosophical work for the positions that take laws, or at least some sort of necessitation relation, as being ontologically basic entities. Any intuitions doing this much work should be met with a great deal of philosophical scrutiny. However, upon reflection, the intuition that the laws govern does, at least thus far, survive the critics' attacks.

But it should be said that there is an important and interesting thread to be found within certain of these replies. In general, the anti-Humean thought experiments assumed that if the laws differed in the relevant worlds, then, Humean Supervenience must be false. In contrast, the On-Balance Reply adopts a strategy that holds that intuitions aren't philosophical trump cards that immediately cause us to reject a counterintuitive view. Instead, the view may turn out to be correct because on balance, it has theoretical virtues that outweigh its counterintuitiveness.¹⁹

Clearly, the Humean is not aiming at a traditional conceptual analysis of the law concept, but rather, a revision of the ordinary concept of lawhood. And it may very well be that in doing philosophy on the lawhood concept, it is found that the most plausible and interesting philosophical theory is one that departs from the ordinary concept in one or more dimensions. Of course, I do not think that Loewer's defence goes far enough, in the sense that it does not show that Humeanism is the most attractive theory. But I believe that Loewer has marked the terrain—it is only in determining which theory of laws satisfies the greatest number of desiderata that we will ultimately see whether the intuitions can be accommodated, or must be resisted on grounds that there is a theory that has greater theoretical utility than one which accommodates the intuition that laws govern. Although this is an issue that awaits further work, I think we can conclude, on the basis of the present discussion, that the recent wave of Humean replies in the literature fail.²⁰ For it fails to show that the anti-Humean thought experiments are, at the end of the day, insignificant to the lawhood debate. On the contrary, such intuitions, at least thus far, have survived the scrutiny of the critics.

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¹⁹A further point of interest, which goes well beyond the existing literature, is whether an alternative MRL view is independently plausible and can satisfy the intuitions behind the Mirror Argument, in particular.

²⁰Loewer's current work seems to be following the path of defending Humeanism with respect to certain key desiderata. See, e.g., Loewer [2004].

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