Normative and Natural Laws

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1. Introduction

David Armstrong remarks that one task of natural science is to 'state the laws which things in space and time obey'.[1] It is common to think of the world obeying or being regulated by the laws of nature but how literally should we take this common thought? We may be inclined to think that it should not be taken too literally for such obedience would raise many difficulties. Are the laws literally prescriptions that objects in space and time obey? The origin, status and enforcement of such prescriptive laws would seem quite mysterious. Did anyone prescribe these laws? If not, how did they get there? What in the world are such laws if they are not summaries or systematizations of actual events in that world's history? Because of such problems, we tend more to agree with Ayer when he said, with confidence, 'we do not conceive of the laws of nature as imperatives'.[2]

However, despite these obvious problems, something related to prescriptivism about natural laws has been advanced by E. J. Lowe.[3] His theory approaches prescriptivism and yet it is not without redeeming features. It has the virtue of being a dispositionalist view and it explains certain difficulties which non-prescriptivist theories of natural laws would struggle to answer.[4] Lowe calls his theory a

[1] D. M. Armstrong, *What is a Law of Nature?* (Cambridge University Press, 1983), p. 3.

[2] A. J. Ayer, 'What is a Law of Nature?' in *The Concept of a Person* (MacMillan, 1963), p. 210.

[3] E. J. Lowe, 'Sortal Terms and Natural Laws', *American Philosophical Quarterly*, **17** (1980) 253–60; 'Laws, Dispositions and Sortal Logic', *American Philosophical Quarterly*, **19** (1982), 41–50; 'What is the "Problem of Induction"?', *Philosophy*, **62** (1987), 325–40; 'Miracles and Laws of Nature', *Religious Studies*, **23** (1987), 263–78 and *Kinds of Being* (Oxford: Blackwell, 1989), chapters 8, 9 and 10.

[4] Lowe's approach answers a class of problems better, I think, than the main other option: the *ceteris paribus* approach (see, for example, S. Schiffer, 'Ceteris Paribus Laws', *Mind*, **100** (1991), 1–17 and P. Lipton, 'All Else Being Equal', *Philosophy*, **74** (1999), 155–68). I will be pointing out below some of the advantages of Lowe's approach over *ceteris paribus* approaches.

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normative account of laws[5] so let us follow him in this to distinguish his version from any prescriptivist theory pure and simple.[6] Despite its virtues, the normative account has been almost completely ignored and I want to give it some of the attention it rightly deserves.[7]

My strategy is as follows. After stating some general assumptions at the basis of this discussion, I will outline the attractions of a normative theory of natural laws. This will also highlight a number of problems, concerning exception cases, which have had unsatisfactory consideration elsewhere but which must be answered by any credible account. The virtue of the normative account is its ability to answer these problems and I try to develop and explain this part of the theory in some different ways to Lowe. However, in the fourth section, I show why a normative account is nevertheless undesirable and, more importantly, why the analogy between natural and uncontroversially normative laws breaks down. Hence, I conclude against the initially promising classification of natural laws as normative. If they are not normative, though, what of their apparent ability to be true despite exception cases? My answer is that a descriptivist theory of laws will suffice though it has to be the right kind of descriptivist theory. Lowe is correct that a simple Humean regularity theory will not do. I go on, therefore, to outline some of the features an acceptable descriptivist theory must have and show how these features deal with the exception cases. This will not be a full and complete argument for the descriptivist theory, however; this paper aims to emphasize just one advantage of such a view. Despite rejection of the normative account, substantial parts of Lowe's theory will be shown to be acceptable.

[5] M. Lange's 'normative' account of laws ('Natural Laws and the Problem of Provisos', *Erkenntnis*, **38** (1993) 233–48) is not the same as Lowe's. Lange's account is normative in that law statements are said to justify certain claims about what ought to be expected, bringing to mind F. P. Ramsey's 'forecasting' theory of laws ('General Propositions and Causality' in his *Philosophical Papers*, D. H. Mellor (ed.), (Cambridge University Press, 1990), p. 163). Lange's view will not be considered further here.

[6] A word may be helpful on the relationship between the normative theory and prescriptivism in general. If what I say later is correct, the normative account is not deliberately prescriptivist; i.e. it doesn't openly claim that laws are prescriptions of a law maker. The normative account is basically the view that natural law statements have the same normative sense as legal and moral laws. But if my argument is right, no appropriate sense of normativity for natural laws can be found that is not prescriptivist. I can, however, leave the possibility open that there is a non-normative prescriptivism, e.g. if God prescribes exceptionless regularities for which a more traditional, non-normative, account of laws suffices.

[7] Neither myself nor E. J. Lowe know of any discussion of the normative account in print.

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2. Assumptions

A preliminary distinction needs to be made in an attempt to avoid possible confusion about what follows. The distinction is between laws and law statements. Law statements are linguistic in nature and articulate or describe the laws themselves. The latter are a certain kind of facts about non-linguistic reality and the truth-makers of law statements. This is a very bare statement but it is important that we keep it in mind. 'All ravens are black' may be offered as a putative natural law but it is not: at best, it is an *articulation* of a putative law. Some may be tempted to deny the distinction but the differences with such a view would be so broad and fundamental that they cannot be discussed here. The questions we consider will differ according to whether the subject is a natural law or the statement of a law. With the latter, our concern may be with the logical form of a law ascribing statement. This is an area that for a long time was considered to be uncontroversial. With the former question, our concern is with what kind of facts are those that we should class as laws. Are they single facts about groups of things or collections of many facts about individual things? Are they facts about probabilities and, if so, what kind of facts are these?

A second assumption is that we can answer these questions in a general philosophical way. Undoubtedly, any philosophical account of laws cannot be wholly revisionary in that it must to a large extent have an element of description of what counts as a law in the natural sciences. The usefulness of the theory of laws for actual scientific practice seems as good a criterion by which to judge the philosophical theory as any. My view, however, is that claims about laws can be founded on a philosophical base which may be more or less useful to philosophers, scientists and philosophers of science. Some scientists accept a law as confirmed by one well-controlled experiment. Popper's theory of laws offers little to explain this. Similarly, there is little on offer there to explain why, for the most part, an apparent falsification of a law is sooner rejected than the law itself.

3. The argument for the normative account

The case for the normative account can be explained and justified through three related claims. These are: first, that natural laws have the modal features of normative laws; second, that normativity of laws is the only way to make sense of the conceivability of miracles and, third, that the normative account fits best with the true logical form of law statements. The interdependence of these three pillars

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of Lowe's theory is based on the single claim that unites them: that laws permit exceptions in a sense to be explained. I will, however, look at the three separated arguments in turn.

a. *Modality*

Lowe maintains, plausibly, that statements of natural laws share modal features in common with other uncontroversially normative laws, the paradigm cases of which are legal and moral laws. The modal similarity concerns what is, and what is not, necessitated by a true law statement. Two of these common modal features are that they *do not* license the following inferences (where P = permit; O = obligate; Lα = the set of actual laws; *a* = an event):

(i) ¬P (*a*, Lα) entails O (¬*a*, Lα)
that the laws do not permit *a* entails that they obligate not-*a*.

(ii) O (*a*, Lα) entails *a*
that the laws obligate *a* entails *a*.

These entailments hold for logical laws but not, Lowe argues, for moral or legal laws *and* natural laws. The case of (ii) not holding for normative laws is easiest to understand and least controversial. In the case of (ii), moral law arguably obligates that I have compassion for others but this does not entail that I have compassion for others as I may not. 'Obligate' is intended as a normative term suggesting it should be the case that … or I should … The case of (i) will be best understood after we have looked at miracles in the next subsection but, as I will show later, the claim that (i) does not hold for natural laws is unsatisfactory.

How can it be that natural laws fail to back the entailment in (ii)? Lowe says that the laws obligating *a* do not *entail a* even though they may make it that *a* normally. The laws obligate that ravens are black, for instance, and yet there may exist a raven which is not black. What is remarkable and yet sensible about Lowe's account is that such an exception case as an albino raven is seen as consistent with the law that ravens are black. The law and the exception can be consistent if true natural law statements are understood to be normative, just as there may be a bigamist though bigamy is illegal.

There is a sense in which the bigamist breaks the law against bigamy, however, so why not say that the albino raven breaks the law that ravens are black? This point draws the wrong comparison. The albino raven does not *falsify* the law in the Popperian sense of falsification; that is, the existence of the albino raven does not prove *that it is not a law* that ravens are black. The comparison with bigamy is there to see. The existence of a bigamist does not prove that it is not

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a law that bigamy is banned. Bigamists and other criminals cannot falsify the law by breaking it, removing it from statute perhaps. So the normative view of natural laws says that the exception case does not falsify the natural law. Questions remain, clearly. We will want to understand why the exceptions do not count as falsifications and whether there is anything that will count. We will want some further justification for the claim that there can be such exceptions to genuine laws. Let us grant, for the moment, however, that there is some plausibility in the albino raven case, for are there not instances of freak cases which appear contrary to a covering law and yet we nevertheless still hold the law?

b. *Miracles*

Returning now to the failure of the entailment in (i), Lowe's reason for claiming this must be something like the following. The laws may not permit a man to walk on water but this does not obligate that no man ever walks on water. How is this so?

The notion of a miracle is traditionally understood to be connected with that of a law of nature. This is because the best definition of a miracle previously available is that a miracle is (A) a violation of a law of nature (B) by divine intervention.[8] This poses a serious problem, however. To make sense of the notion of a miracle we need a notion of laws which permits the logical possibility of their violation but such a notion is not easy to find, especially if we have a view of laws as summaries or systematizations of omnitemporally actual events. Are we to say, then, that miracles are *logically* impossible or even an incoherent notion?

Hume's empiricist account of natural laws could be used to generate the following argument which would make miracles logically impossible:

(H1) (1) The laws are generalizations about actual events
∴ Anything that actually happens must be included in those generalizations
∴ Every actual event is part of the constitution of the laws of nature
(2) A miracle is an exception to or violation of a law of nature, by definition
∴ There can exist no actual miracles.

Alternately:

(H2) assume:
L = a putative law

[8] See R. Swinburne, *The Concept of Miracle* (London: MacMillan, 1970), chapters 3 and 5.

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m = a putative miracle that would violate L
it follows:
(a) $L \rightarrow \neg m$ (if L really is a law then m has not occurred)
(b) $m \rightarrow \neg L$ (if m has occurred then L is not really a law)

Are believers in miracles really asserting a contradiction? To do so would be incoherent and futile but then so too would be the denial of a miracle. We cannot simply be denying that something impossible occurs for this is a trivial claim.

But is this what we understand by a miracle? Do we want to say that they are logically impossible or just that they are possible but do not occur? Lowe's explanation is that natural necessity and logical necessity do not license the same inferences hence '$a \ \& \ \neg \Diamond a$', with its standard modal interpretation, is not what is asserted of an alleged miracle.

However, on a normative account, laws with exceptions *are* conceivable and so then are miracles that are exceptions by divine intervention.[9] Just as moral and legal laws can be violated by immoral or criminal people, so can natural laws be violated by God's will because they are a set of norms or standards. The definition of a miracle as a violation of a law of nature by divine intervention is, thus, no longer a contradiction and miracles can be asserted *and denied* coherently.

c. *The logical form of law-statements*

Lying behind the claims concerning miracles and the modality involved in assertions of law is the claim that the standard view of the logical form of law-statements is unacceptable. What is probably *the* standard view is that the laws of nature are best articulated in statements with the logical form:

(iii) $\forall x \, (Fx \rightarrow Gx)$

that is, a universally quantified conditional of which 'all ravens are black' would be an example and thus a possible natural law statement. There is arguably some kind of natural necessity operator at the start of (iii) but let us not probe the merits of it for now. Backing this view of *statements* may be a view of *laws* as exceptionless regularities in nature but let us concentrate just on law statements for the moment. The universally quantified conditional view is perhaps the most *traditional*, being in Bacon and Hume; *prevalent*, being taken as orthodoxy by Popper; and *is still held*, for instance, by Mellor who says that 'law statements of both kinds [deterministic and

[9] In Lowe's final definition of miracles, however, God plays no essential role. See 'Miracles and Laws of Nature'. p. 276, discussed in §5, below.

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probabilistic] are (or at least entail) 100% generalizations of the form "All αs are β".'[10]

We could call the claim that laws are best articulated by the form of (iii) *Popper's fallacy*. This is slightly unfair in that so many others have taken it for granted, before and after Popper, but it is fitting in this context in so far as Popper became famous for his claim that one counter-instance can falsify a law. This followed from the assumption that laws were correctly stated in the form (iii).[11] The central Popperian assertion is, therefore, that to qualify as a law, a regularity or whatever, must be *at least* exceptionless. Some regularity theorists attempt to distinguish accidental from lawlike regularities and such an exceptionless regularity would be, for them, a necessary but not sufficient condition of lawhood. If Lowe is correct, however, that laws are normative and that the notion of a miracle rests on that of a possible violation of a law, then laws need not be exceptionless and so (iii) does not accurately represent the logical form of law statements; it says something far too strong.[12]

There are other candidates for the form of law statements[13] but, as far as the issue of laws and exceptions is concerned, what needs to be dropped is the claim that law statements are universally quantified. Lowe proposes the following form:

(iv) φF

which requires a new sortal logic, not reducible to standard first-order predicate logic. Laws are correctly expressed as dispositional predications with sortal terms in subject position.[14] That is, laws

[10] D. H. Mellor, *Matters of Metaphysics* (Cambridge University Press, 1991), p. 162.

[11] K. R. Popper, *The Logic of Scientific Discovery* (1934), (London: Hutchinson, 1980), p. 62f.

[12] Note that our account of laws need not entail that *no* law supports a universally quantified conditional. Though a normative law permits exceptions it doesn't *demand* them. A law that all tax forms be returned by a certain date is consistent with them all being on time. In the natural case, however, what Lowe says on 'perfect sortals' will be of relevance (see §5, below).

[13] Some candidate forms, apart from Popper's and Lowe's, are:

a. *an identity statement* [A = B]; e.g. heat = molecular motion.

b. *a probabilistic conditional* [Pr (G/F) = *n*, where *n* (≥0, ≤1)]; e.g. the probability of landing heads, given a fair toss, is 0.5.

c. *a functional co-variance* [(G = *f*(F))]; e.g. force = mass × acceleration.

d. *necessitation between properties* [N (F,G)]; e.g. being unsuspended necessitates falling.

There is no immediate reason why normative versions of these could not be formulated where required.

[14] 'Laws, Dispositions and Sortal Logic', p. 41.

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concern behaviour, in a dispositional sense, of normal sort-members; for example, ravens are black, bread nourishes, horses eat grass. These claims cannot be expressed within orthodox first-order predicate logic as no candidate formulation can express the dispositional sense which the law conveys. Sortal logic employs the standard operators, variables and constants but adds sortal variables and constants and a new instantiation operator '/'. φ, χ and ψ are sortal variables; α, β and γ are sortal constants. A sortal term is either 'a mass noun or a common noun … which may be adjectivally qualified'.[15] Hence 'a/φ' would be the form of a statement such as 'Orville is a bird'; that is, Orville instantiates the bird sort. The sortal logic allows the distinction to be made between occurrent and dispositional predication as follows. 'A bird is flying', occurrently, is represented by the objectual symbol following the predicate, as in standard predication, 'Fφ'. 'A bird flies', dispositionally but not necessarily occurrently now, is represented by the objectual symbol preceding the predicate; hence 'φF'. This distinction between dispositional and occurrent predication is crucial for the statement of laws because laws are statements about *what sorts of things can do*, not what they are actually doing now. The distinction between sorts and individuals is crucial because laws are about sorts, not individuals. Hence it can be a law that birds fly even though no bird is actually flying now. That there is a particular bird that cannot fly, because of injury or birth defect, does not falsify the law, contrary to Popper, because the law *qua* dispositional predication with sortal term in subject position does not entail $\forall x\,(Fx \rightarrow Gx)$ and is not falsified when $Fb\ \&\ \neg Gb$.[16] A distinction is to be drawn, however, between abnormal cases or exceptions and normal members of recognised sub-species. The latter *would* count as falsification of the normative law. An albino raven does not falsify 'ravens are black' but black swans, of the *cygnus atratus* sub-species, do falsify the putative law that 'swans are white'. Hence there is a place for falsifying exceptions to laws, as we think that there ought to be.

Of all possible exception cases for any particular law we can now draw a distinction between three kinds and a spurious fourth. Each

[15] 'Miracles and Laws of Nature', p. 274.

[16] The normative view is superior to the *ceteris paribus* approach in this respect, at least as Lipton articulates the latter ('All Else Being Equal'). His analysis of 'all A's are B's ceteris paribus' is that all A's are dispositionally B's though they may not all manifest that disposition (cf. 'the disposition is there regardless' p. 166). An albino raven is not, however, even dispositionally black in that it has a gene structure which disposes white plumage. The albino raven thus falsifies even a *ceteris paribus* law under Lipton's interpretation but not Lowe's normative law which seems, in this case, the right interpretation.

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of these kinds is recognizable and justifiable and yet common views of laws, such as Popper's, cannot accommodate them all. Let us take as a test of the adequacy of a theory of laws, then, its ability to accommodate each of these types of exception: (1) miracles, which violate a law by divine intervention; (2) 'permissible' exceptions, such as albino ravens, which may violate a universally quantified conditional but not the law correctly described by dispositional predication with sortal in subject position; (3) falsifying exceptions, which identify a member of a recognizable sub-species which has some property contrary to the claimed law for the species, and (4) rejected exceptions. This latter case is not an exception proper for what is meant is a putative exception which is spurious. Incompetent schoolboys find exceptions to general laws which are dismissed on the grounds of experimental failure even if no specific explanation is available for the failing. Note that, even with these cases, Popper fails to give an adequate account, deciding, where a law and an exception clash, always to blame the law.

Laws permitting exceptions thus leaves the way open for an account of miracles as violations of law and this offers a better way of understanding miracles than Lowe's claimed failure of entailment in (i): that the laws do not permit *a* entails that they obligate not-*a*. This entailment does, indeed, seem to hold if the 'permit' and 'obligate' mean permit and obligate *by law*. A miracle is not a case where the entailment in (i) fails for the laws do not permit a man to walk on water *and* they obligate that no man walks on water. Nevertheless a man can walk on water when a law is violated so, although the laws *normatively obligate* no man walking on water, they do not *logically necessitate* that no man ever walks on water. Perhaps this explains why it is so difficult to find an example from the moral or legal cases in which the entailment in (i) fails.

4. Difficulties for the normative account

I have set out the case for what is to be considered the best normative account of natural laws. Next, however, I will argue it is desirable that we resist a normative account of laws. This paves the way for the final section in which I show how a descriptivist theory of laws can give us the same benefits afforded by the normative account but without the undesirable consequences.

I identify two main difficulties for a normative account. First there is the difficulty of explaining how normativity could apply to the case of natural laws, which involves the problem of accounting for its origin and status. Second, there is doubt that the laws prop-

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erly are normative because of a serious disanalogy between the laws of nature and the paradigm normative laws.

a. *The genesis of the norm*

The first difficulty for the normative account, which could be extended to other prescriptivist accounts, is how normativity appears in the world. Lowe himself has no immediate comment to make on this issue, leaving it open, so I will consider two possibilities: first, the supernatural possibility of a deity law-maker and, second, a naturalized normativity.

The first possibility, the theistic claim, is that God prescribes the norms which we perceive as the laws of nature. However, this view rests upon a commitment that is too high a price to pay. God's existence is an issue which is far more philosophically controversial than the normativity of natural laws itself and will be left alone completely in this paper except to say that there is considerable doubt as to such existence. If it is not God who prescribes the norms then it is difficult to see who else could have the power to do so. The initial objection, therefore, is scepticism about the existence of a prescriber of norms.

But even if there existed a being with great enough powers, there would remain something mysterious about the nature of their prescriptions. How are we to explain the way in which the prescriptions bind particular sorts to having particular behaviour and properties? Can it be claimed that there is the same relation holding between moral and legal laws and the events which they 'govern' and natural laws and what they govern? Ideally, a legal law is (a) written in statute,[17] (b) made known to those whom it governs and (c) enforced with known sanctions where violated. Can an equally credible story be told for normative *natural* laws? They are (a´) not written but decreed by God, though (b´) decreed in private; that is, they are made known to no one and no thing that they govern but (c´) enforced directly such that it is impossible to voluntarily obey or disobey them. This story seems less convincing than the former.

Is there, then, hope for a naturalized theory of norms? The problem for such a thing would be in what sense the empirically discovered laws can correctly be called norms? From where can such normativity come? An examination of nature reveals events, regularities, substances and properties. We can record and systematize these but then don't these data come in the form of descriptions of the world rather than prescriptions that bind the world?

[17] There are variations from this 'ideal'. Britain has 'Common law' which is unwritten but has legal force. Civil law is not enforced with sanctions but, rather, involves some attempt at remedying a wrong to another party.

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The motivation for attempting to naturalize normativity may be based on the view that as thought does not entail a thinker neither do prescriptions entail a prescriber so we can have norms without a norm-maker. Similarly, rule-governed meaning in a language can emerge without there being a single authority that makes the rule. Can we say that prescriptions get prescribed without a prescriber in any way similar to these two cases? I am sceptical that they can. We are still awaiting a credible naturalization of normative natural laws.[18]

b. *The norm and the normal*

The second major objection to the normative account is that there is one major dissimilarity between Lowe's normative natural laws and the paradigmatic normative laws. This is that there is no logical gap between the *norm* and the *normal* with normative laws of nature whereas there is such a gap in the case of the moral and the legal. Consider the case of speeding in a motor vehicle being illegal. This in no way entails that not speeding is normal; it is consistent with everyone breaking the law at some time, if not most of the time. One current problem of the Russian economy is that tax evasion is normal but it is by no means the legal norm or prescription. A parallel situation would be easy to imagine in the moral case; for example, it being immoral to covet someone else's wife yet it being normal to do so. However, in the case of natural laws, Lowe says:

> According to the normative account of laws, a statement of natural law (a 'nomological' statement) characteristically implies that normal or typical individuals or exemplars of some recognizable natural kind possess a certain dispositional property, that is, are disposed to behave or appear in a certain way …'.[19]

The problem here is not with the dispositionalism, which I will discuss in the next section, but that no obvious distinction is being drawn between what is the norm or prescription and what is normal.

In the terms of Lowe's theory it appears impossible to avoid the disanalogy because it is impossible for the 'normal' exemplar to be contrary to the norm. He says 'a normal exemplar of any sort φ is simply one which satisfies all the true natural laws pertaining to φ.'[20]

[18] It should be noted that in correspondence E. J. Lowe has suggested to me another way in which normativity for laws can originate. I would prefer to leave it to him, or others, to undertake the considerable task of developing this into a credible position as I suspect it will not be thought persuasive as it stands.

[19] 'Miracles and Laws of Nature', p. 273.

[20] *Kinds of Being*, p. 174.

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To be a normal raven is to satisfy all the true laws for ravens. But this will include the law that ravens are black so it is impossible for something to be both a normal and a white raven. If normal exemplars of φ are F, presumably this must mean something like a large majority of φ-exemplars being F. And if the large majority of φ-exemplars are F, then the norm must be that φF, so φF is a natural normative law. Nothing like this inference can be made for moral or legal laws. Hence, the case we found for legal laws, where paying taxes is a law but not paying taxes is normal, has no analogue. The case where φF is a law but normal φ-exemplars are ¬F cannot exist if there is no distinction to be made between the norm and the normal and, given that Lowe has defined the norm in terms of the normal, no such distinction can be made.

I allow that the normative account could be revised or developed in a way to avoid this charge but what the immediate disparity suggests is that the laws are actually discovered descriptions of some kind rather than prescriptions. This claim, however, needs more development and justification.

5. A descriptivist account

If we are to look for a descriptivist alternative then what have we got to provide? The biggest puzzle for the descriptivist about laws is to explain how the laws can in some sense describe something about the world but nevertheless allow exceptions, both ordinary and miraculous. A regularity theory of laws cannot obviously do this. Laws are descriptive, for the regularity theorist, but descriptive of absolute exceptionless regularities thus if, in actuality, a is a raven and a is white, then it cannot be a law that ravens are black.

My first main claim in this section, however, is that Lowe is mistaken if he takes it that his opponent, the descriptivist, is committed in the first place to a regularity theory, with its allegiance to what I will call actualism, and in the second place to laws being exceptionless and articulated always in universally quantified conditionals. The second main claim in this section is that there is a form of descriptivism which is dispositionalist and which can account for exceptions to laws as well as Lowe's own normative theory. Finally, I claim that this improved descriptivist theory of laws, given the problems with Lowe's normative theory, should be preferred.

The descriptivist must draw a distinction between actualism and dispositionalism and opt for the latter.[21] The actualist takes laws to

[21] There have been other attempts to base natural laws on dispositional properties in: S. Shoemaker, 'Causality and Properties' (1980), in his

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be descriptive of the natural world but what it is that they describe is the history of events in that world. The naive Humean view is the simplest form of this. The formula for generating or discovering laws is: note all observable events; separate out the exceptionless regularities, these are the laws; describe them in 'all'-statements. The basic commitment of any actualist theory of descriptive laws is that the laws of a world are entirely fixed by, determined by, or supervenient on, the actual events of that world such that any two worlds with the same omnitemporal histories have the same laws of nature.

a. *'Permissible' exceptions*

The advantages of the dispositionalist over the actualist views of descriptive laws have been expounded elsewhere.[22] Two prime advantages are that, first, we may expect many laws to be probabilistic in nature and dispositionalism will better explain the reality of such laws. Taking the 0·5 probability of a tossed coin landing heads as a model, there is no reason to expect the actual omnitemporal history for any particular coin to exhibit a 50/50 distribution of heads and tails when tossed. A coin may be tossed only once. If the law describes the disposition of the coin to land head or tail with equal probability, rather than what it actually lands in that world's history, then the 0·5 probability of heads makes sense. This is because dispositions need not manifest themselves. Tests may not be carried out and even when they are carried out, some other condition may interfere and prevent their manifestation. This allows for the second advantage of the dispositionalist view; namely, that it can make sense of an unrealized law. The arch-actualist, Armstrong, refuses to accept that there is such a thing as an unrealized law, just as he thinks there is no such thing as an uninstantiated property. Instead we must speak of *possible* laws or *possible* properties. One of his concerns is that there is nothing real, no truth-maker, that makes it such that L is a law in the world where it is not realized in events.

[22] S. Mumford, 'Laws of Nature Outlawed', *Dialectica* **52** (1998), 83–101.

Identity, Cause and Mind, (Cambridge University Press, 1984), 206–33; C. Swoyer, 'The Nature of Natural Laws', *Australasian Journal of Philosophy*, **60** (1982) 203–23; D. H. Mellor, 'Necessities and Universals in Natural Laws', (1980) in his *Matters of Metaphysics*, (Cambridge University Press, 1991), 136–53; B. Ellis and C. Lierse, 'Dispositional Essentialism', *Australasian Journal of Philosophy*, **72** (1994) 27–45. The position advanced here is not obviously identical with any of the above nor are the arguments in its favour taken from them.

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The dispositionalist can ascribe unrealized laws which are based upon some facts about the world, however, for dispositional properties are to be accepted as real properties in the world. An ontology of real dispositional properties is required for this view and one can be found elsewhere[23] but we need not go into that here as it is unlikely to be the point of contention between this and the normative theory of laws which itself invokes irreducible disposition ascriptions to sorts.

Unrealized laws thus involve ascriptions of dispositions which don't get manifested but nevertheless are there. Genes of one sort of animal φ may be disposed to react in a certain way with genes of another sort of animal χ but because no individuals from these two sorts have ever mated the law has never been manifested. Nevertheless there is a law, an uninstantiated law, the facts of which reside in the dispositions for mutual manifestation of the genetic structure for each sort. Hence we accept that some sorts of animal are able to reproduce and some are not. We can accept these as facts about the world even if some are unknown because we have not tested every possible mating combination.

I am thus in agreement with Lowe that laws involve disposition ascriptions to sorts or kinds. The disagreement concerns descriptivism versus normativity about laws. My claim is that the dispositionalism is sufficient to account for the claimed advantages of the normative theory. Lowe uses as an example the law that ravens are black which is accepted even though there are abnormal exceptions. The descriptivist can accept this as a disposition ascription true of the raven kind. It can be taken as true of normal ravens while allowing that abnormal ravens need not be black. 'Normal raven' need not be defined in terms of being black, however. What counts as normal can be based on some other factor, such as gene structure. From what we know, however, this normal gene structure disposes the development of black ravens. Once the factor is decided for determining what counts as a normal raven, such as gene structure, it is hard to see how anything other than a statistical majority, discovered empirically, can determine the normal plumage colour. The descriptivist can accept this without cost but for the normative theorist it exhibits the difference from moral and legal norms that was highlighted in the last section. A situation seems imaginable where what was once the normal colour becomes outweighed by what was abnormal. Let us assume that radiation levels rise and genetic abnormalities become common. Call ravens with these abnormalities 'mutants'. Assume that the mutants are normally white (there can be abnormal, non-white, mutants). Eventually the mutants out-

[23] S. Mumford, *Dispositions* (Oxford: Clarendon Press, 1998).

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number the previously 'normal' black ravens. What can the normative theorist say here? It would be a curious norm or prescription that was overtaken, and indeed altered, by events that it supposedly governs but that must be what happens. Normal colour is determined by what is the majority and the majority happens to be white so a normative law of nature has changed: ravens are white is now the law. The descriptivist has no reason to fear such an alteration in the state of laws, as long as it represents an actual change in the dispositions of the sort rather than some temporary interfering factor. For a change to the descriptivist law, the ravens must be dispositionally white.

b. *Miracles*

Individual exceptions are thus permitted to laws which are ascriptions of dispositions to sorts or kinds, hence there is no objection here to the logical form of law statements proposed by Lowe. How, though, can the logical possibility of miracles be allowed in the descriptivist account? Doesn't it appear that the descriptivist faces the Humean problem that if a putative miracle occurs then its occurrence has to be incorporated within the descriptions that form the laws and so those laws *cannot* be violated by *any* putative miracle? If so, then miracles are ruled logically impossible, counter-intuitively. Is there, then, anything that could count as a miracle in the descriptivist theory?

My response is that, as in Lowe's account, miracles which involve violations of laws can be accommodated in descriptivism but, in contrast with Lowe's account, the correct view of miracles is *not committed* to them violating laws in every instance.

First, contrary to Lowe, I take it that a miracle must be an event or fact for which divine will or, at least, a supernatural cause is responsible. The traditional Humean derived view of miracles, as noted before, takes them to be (A) violations of laws of nature (B) by divine intervention. Lowe eventually settles on the definition of a miracle which discards (B) and bases miracles on a refined version of (A), namely, a miracle as that which violates the *entire system* of laws.[24] Certainly any such wholescale violation of laws would be astonishing but need we say that it is literally miraculous? I say not, unless we believe that some supernatural agency or cause is responsible. That we could think of no other explanation for the violation I would not take as sufficient evidence for divine agency. I would seek to retain a version of (B), therefore, and keep a requirement similar to that of divine agency. I speak, more broadly, of a super-

[24] 'Miracles and Laws of Nature', p. 276.

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natural cause because I do not want to rest the possibility of miracles on God's existence alone for it would be reasonable to call an event miraculous if it were caused by one of a number of supernatural beings, an angel doing such a being's work or a non-natural mechanism set up to intervene in the natural world.

I allow that such miracles could involve violations of laws. My descriptivist account of miracles would have to be, therefore, that such a miracle was an alteration to the natural dispositions of a sort or individual by a supernatural cause. The world began its motion as a history of sorts of things with dispositional properties and we describe such with our descriptive dispositionalist law statements. A miracle would occur when a supernatural cause, for some reason, intervened in the natural world and altered the dispositions of something, making it the case, for instance, that a man can walk on water. This would require the supernatural cause affecting, in some way, the mutual disposition for manifestation that exists between water and a man upon it.

However, while Lowe retains a version of (A) and dispenses with (B) from the traditional definition, I take only a version of (B) to be essential as the supernatural cause of a natural event need not result in the violation of a natural law.[25] An example of this sort could be the coming into existence of certain subatomic particles. Such events occur regularly and unremarkably in the natural world. However, suppose that God decides that on a particular day he will cause all such events. Here, such events will be of supernatural origin and yet involve no exception to natural laws. Thus I define miracles as:

(B´) natural events or facts which have a supernatural cause

with (A), violations of laws of nature, being an optional, no longer essential, component of the miraculous.

This account, I think, is far more in tune with the pre-critical concept of a miracle than is Lowe's but Lowe's account also has the disadvantage of not satisfactorily distinguishing permissible and miraculous exceptions. He says that the existence of an albino raven is a 'permissible' exception; that is, it is an exception consistent with the law *because* it can be explained in terms of other laws, of genetics. With a miracle, however, we have a violation of the entire system; by which he means that there is no other law that could explain this exception. There is a problem here. The following argument suggests that this will not distinguish permissible and miraculous

[25] In agreement with C. Hughes, 'Miracles, Laws of Nature and Causation', *Proceedings of the Aristotelian Society*, Supplementary Volume LXVI (1992), 179–205.

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exceptions. A supposed miracle *m*, the levitation of a person for instance, may violate a universally quantified conditional C_1. Whether this is a permissible or miraculous exception to the relevant law L_1 depends on whether there is another natural law which explains the occurrence of *m*. Let us suppose that the event which explains *m* is *e* but *e* itself is an exception to a universally quantified conditional C_2. Couldn't this be a permissible rather than miraculous exception to its relevant law L_2? And couldn't the same reason be given for saying this as was given for the occurrence of *e*, and so on for any further stage? What we could have is a case where every event in the explanation of *m* is itself an exceptional one. We can always say that the event is non-miraculous, therefore, by citing a law which is *permissibly* excepted.

The only way in which this strategy could be ended would be by a law which was absolute: for which there could be no permissible exceptions. Lowe, indeed, thinks that there are such laws which govern the theoretical entities such as electrons. Such theoretical entities, however, have a 'semi-ideal' status.[26] They are terms which can thus be 'perfect sortals', meaning that they have no exceptions. This, however, does not threaten the generality of his account, he says, in so far as those things we say are true of such perfect sortals are true by definition and, in contrast, 'such tidiness is not to be found amongst the objects of everyday experience (like ravens).'[27] If, however, the question of whether *m* is a permissible or miraculous exception to a law is finally settled by appeal to a law which is true by definition, we are left feeling that there is something not quite satisfactory. More so as theoretical entities may become observable as the technology of observation advances. When these sortals become observable they become objects of experience with the accompanying possibility of exception cases. Such perfect, exceptionless laws would thus be a shifting sand on which to build the distinction between permissible and miraculous exceptions.

7. Conclusion

There is something deeply unsettling about any theory of laws which allows them a kind of prescriptive, normative, obligating or regulative force. This is because a plausible account would be required of the claimed governing relation that was supposed to exist between such laws and the events which they somehow controlled. The view of laws being *fixed by* or *descriptive of* something seems a more intuitively pleasing picture but as the problems raised

[26] *Kinds of Being*, p. 174.
[27] loc. cit.

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in this paper show, we need a satisfactory account of what the laws describe. The truth must lie somewhere between a regularity and a regulative theory and I suggest that we devote our efforts to perfecting such a middle way.[28]

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