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NOMO(THEO)LOGICAL NECESSITY¹

Del Ratzsch

The issues of just what laws of nature are and what makes statements law-like have been more discussed than advanced. After exploring the general area and uncovering some difficulties which, I suspect, make the case even knottier than generally imagined, I argue that certain resources available only to the theist—in particular, counterfactuals of God's freedom—may provide the materials needed for constructing solutions.

The logical status of physical natural law statements has been, to say the least, problematic. Just what *are* natural laws? And what sorts of statements express natural laws? The easily available categories of truth—such as necessary truth or contingent material generalization—have been widely perceived as unsatisfactory, and although enjoying sporadic popularity, the easily available categories of falsehood seem even worse. Laws and their expressions have a special sort of strength and character not easy to capture. Beyond that is a deeper ontological question. If statements of law have some special logical strength of character, what underlies that character? What is the ontological underpinning of law? In what follows, I will first review and explore some questions concerning the logical structure of law statements. There are, I think, five classes of candidates. Two—law statements as material generalizations or as categorical necessities—have been almost universally rejected traditionally, and I shall reject them as well. A third—lawhood as defined by particular roles in a deductive system—I shall reject fairly summarily as well. The remaining two—one employing universally quantified subjunctive conditionals and the other involving entailment of dispositional properties—both have a variety of technical difficulties, but they also have in common a feature which seems to me necessary to any adequate characterization of law. It is that common feature and its possible ontological implications which I find of interest, and which I shall explore in the later part of the paper. Out of those ontological implications some suggestive theological implications will emerge, and I shall discuss those in the final section of the paper.

Law statements as material truth functional

Earlier in this century, various philosophers, impressed both with the promise of formal logic and with the prescriptions of positivists, endeavored to reduce

everything in sight to forms that could be captured by the resources of first order logic.² Attempts to capture the appropriate character of natural law statements in such terms were never successful. There were a variety of difficulties, but among the most serious was the inability of constructions from truth functional connectives to 'support' subjunctives.

For instance, it is generally admitted that if *iron expands when heated* states a law, then it follows that *were this bit of iron heated, then it would expand*, and perhaps also that *were this object iron, it would expand if heated*. But ordinary material generalizations do not support those sorts of inferences. Consider Nelson Goodman's famous example: *all the coins in my right pocket on VE day were silver*. We could not legitimately conclude from that that had this penny, *p*, been in my right pocket on VE day, it would have been silver. The generalization, in this case, does not support the relevant counterfactual.

Some of the material constructs proposed as giving the logical structure of law statements were more sophisticated than mere generalized material conditionals (for instance, Carnap's reduction sentences) but extensional truth functional logic simply did not have the required resources.

Law statements as (categorical) necessary truths³

The view that law statements are necessary truths has not been a terribly popular one historically, although it would have the advantage that such statements would entail the relevant subjunctives. But few, until recently, have explicitly endorsed it. And taken baldly, it does seem counterintuitive. For instance, it would hardly *seem* a threat to the fundamental principles of coherence had our ordinary physical objects attracted each other proportionally to the inverse of their distances to the 2.00001 power. And it *seems* unlikely that first order logic would collapse were the speed of light not a limiting constant. And so forth.

It may be, however, that the initial apparent implausibility of laws holding necessarily comes from an implicit tendency to think of necessities in terms of simple, immediate first order entailments involving *categorical* predicates (or properties). For instance, we take as paradigm cases of necessary propositions such things as *all bachelors are unmarried*, $2 + 2 = 4$, and so forth. The properties involved in the relevant states of affairs are categorical in the sense of being unconditional or non-dispositional. And to think of laws as having that sort of character is, indeed, seriously counterintuitive. There is, however, a different sort of necessary statement that some have recently proposed as giving the structure of statements of law, and which appears much more plausible. We will look at that view shortly.

Laws statements as defined by deductive roles

A number of commentators have been attracted to the idea that whether or not some statement expresses a law depends (at least partially) upon whether or not it plays an appropriate sort of role in an appropriate sort of deductive system. Although the details of the roles and systems may differ, this general view can be found in writings ranging from those of Ernest Nagel to those of David Lewis.⁴ Of course, it is well known that any deductive system can be axiomatized in any number of different ways. While some roles and characteristics (being true, being a proposition within the system, entailing or being entailed by specifiable propositions within the system, and so forth) do not change under varying axiomatizations, others (being an axiom, for instance) do. Thus, some propositions which fulfill one role in one axiomatization may fill some entirely different role in another. The roles frequently cited as defining lawhood—axiomhood, for instance—are among those roles which are changeable. But as an unrepentant realist, it seems to me that some things simply are laws and other things simply aren't, and that, consequently, *variable* status with respect to a deductive system cannot tell the whole story of what is or is not a proper statement of law. Things get even slipperier in views according to which a law statement is something which plays a specified role in whatever system gives us the "best combination of strength and simplicity", since that depends (presumably) on what we take "best" to come to, which depends on various of our epistemic values. It might be argued that if we are dealing with logical equivalences, the claim that some from among those equivalences really *are* laws, and others of the equivalences really *aren't* is incoherent. But logical equivalence does not constitute identity of propositions, and that logical equivalence to a law statement is an indicator of lawlikeness is at a minimum unclear.

I believe, then, that we can correctly reject the ideas that statements of natural law are either material statements, categorical necessities, or arbitrary components in particular deductive systems. After a short detour, we will turn to the remaining two options.

Three grades of subjunctive involvement

It is widely recognized that there are intimate connections between subjunctives and laws. On the most general level, as noted earlier it is widely agreed that laws support subjunctives. That is usually taken to mean that statements of law (whatever they may be) *entail* subjunctives. One could simply stop at that point, claiming that laws are not themselves fundamentally subjunctive in character, although there is a connection in that subjunctives logically flow from them. Second, one could hold that statements of law contain *components* the proper *analysis* of which involves subjunctives. Or third, one could simply identify law

statements with certain types of subjunctives—universally quantified subjunctives, for instance.

We have already briefly examined one view on the first level—laws as categorical necessities. We now will examine a view from each of the remaining two levels. My own view is that there is indeed something fundamentally subjunctive about law statements, and that consequently whatever the correct analysis of the structure of law statements turns out to be, it will lie somewhere on either the second or third level.

Let us begin with a view of the second sort—that law statements involve components the proper analysis of which (I believe) involves subjunctives.

Laws as dispositional necessities

Recent views according to which law statements are necessary are much more subtle than older ones. On these views—e.g. “causal powers views”—law statements express necessary connections between properties (or the having of properties), but not all the properties involved are categorical—in fact, the ‘consequent’ properties in such statements are, on these views, *dispositional* properties.⁵ Thus, the logical structure of the law governing iron’s expandability under heat is something like

(1) *being iron entails expansiveness under heating.*

(Or that *being crystal entails being fragile* might be a law).

The law, then, involves that dispositional property being essential to the nature of iron. Since, of course, dispositions can be thwarted, overridden and whatnot, a law statement, although necessary, would not have the wooden rigidity we normally associate with necessities.

Although this view has a number of attractions (some of which will emerge later), it is still seriously incomplete as an analysis until we know what sort of animal a dispositional property is. The attractiveness which this very fuzziness may permit may dissipate along with the fuzziness when we try to sharpen the picture up a bit.

There seem to be two broad categories of views concerning dispositional properties: that they are ultimately reducible to logically or materially connected underlying categorical properties, and that they are not so reducible. Both views have had some recent popularity, so we will briefly consider each in turn.

The idea that dispositional properties are reducible to categorical properties in some logical or material relationship has something of a history.⁶ I take it that this alleged reducibility was what underlay Carnap’s attempts at constructing reduction sentences from purely categorical and material resources. In any case, the founding intuition seems to be that a dispositional property (*fragility*, for

instance) involves some sort of stable connection between, say, being hit in some specified way and being shattered. What is of interest is the exact nature of the connection, exactly what the connection is a connection between, and how that connection is to be captured and expressed formally. If we are restricted to the standard logical connectives, we must evidently choose between property entailment or some contingent material connections. But neither seems adequate.

If dispositions were construed as property entailments, and if law statements were property entailments of dispositions, then law statements would be of the following form:

(2) That x is A entails (that x is B entails that x is C)

It seems seriously implausible to claim that dispositions simply are entailments, but this proposal has other serious difficulties as well. To begin with, instances of the consequent of (2), i.e.

(3) that x is B entails that x is C

will, if true, by themselves entail instances of (2)—at least if we hold the quite plausible views that modal propositions if true are necessarily true and that necessarily true propositions are entailed by any proposition whatever. Thus, the law—(2)—would follow trivially from the disposition alone, meaning that the antecedent of (2),

(4) that x is A

played no significant role whatever. But surely in the case of the statement concerning iron ((1) above), it isn't just irrelevant that it is *iron* under discussion.

In order to try to accommodate the role that the antecedent intuitively plays in such cases, it might be required (as some in fact do require) that the antecedent property be an *essential* property or even a *kind* property. That, however, will not change the fact that the antecedent plays no significant role. In fact, statements of the form (2) will still be true, no matter what essential or kind property the antecedent involves.

Worse yet, if something like (3) is correct, if properties B and C are related necessarily, and if that represents a disposition, then absolutely every object will have that disposition since everything will be necessarily such that if it is B it is also C . But any property possessed by absolute everything is often going to be seriously explanatorily tenuous.

If the antecedent is to play any significant role at all, then the antecedent must be within the scope of the same modality (if any) as the rest of the formula. That means on the present view that we must retreat at a minimum to perhaps something like

(5) That x is A entails (that $B * C$)

where the “*” represents some materially constructible connective.

That doesn’t look too promising either. For one thing, depending upon what the proposals for “*” are, (5) may simply reduce to a variety of categorical entailment. For another, reducing dispositions to some material connection between categorical properties does not seem very plausible. Dispositions simply seem stronger than anything constructible from merely material resources. That, I take it, is why positivist-style reduction sentences never worked.

Thus, if the special character of law is buried in a disposition and then dispositions are interpreted as property entailments, the results are formally much too strong, and if the dispositions are interpreted purely materially the dispositions are much too weak and the overall result may simply be a variety of categorical necessity.

It looks, then, as though if laws can be construed as expressing necessary connections between kind properties and dispositions, the dispositions cannot be reducible to some pair of categorical properties connected in ways expressible by the usual complement of logical connectives and operators.

There is, however, a different view of the nature of dispositions which has a respectable pedigree, and that is that the constituent properties of dispositions are linked subjunctively.⁷ A proper analysis of e.g. the disposition *fragility* might perhaps be as follows:

(6) *x* is fragile: were *x* hit in manner *m*, *x* would shatter

Subjunctives, of course, represent a type of connection and a degree of strength not available with the more standard connectives, and their strength lies between that of necessity and that of mere material implication or equivalence. Subjunctives will also, of course, support subjunctives trivially. All of that is presumably in their favor. On this view of dispositions, then, a law statement will have the structure (taking some grammatical license):

(7) *being F* entails *being such that were it A then it would be B*

(or possibly

(8) *being F* is logically equivalent to *being such that were it A it would be B*

For example,

(9) *being crystal* entails *being such that (were it struck in manner m, it would shatter)*

That may be seen as initially promising, but we’re perhaps not out of the woods yet. If (9) is true, it will follow that (using “>” for the subjunctive)

(10) Necessarily (*x*) ($Cx \supset (Mx > Sx)$)

which in turn entails

$$(11) \text{ Necessarily } (x) ((Cx \wedge Mx) \supset Sx)$$

The acceptability of (11) seems to me not entirely obvious. Does the striking of a specified sort of crystal in a specified way *entail* the shattering of the crystal? The underlying problem here is that necessity swamps subjunctivity (e.g. $\Box(P \supset Q) \equiv \Box(P \supset Q)$). It is not clear to me how different from categorical necessity views the present view really turns out to be, and if they are inadequate, so may the present view be.

One could, of course, claim that dispositions are not subjunctive, but are either fundamentally unanalyzable or involve primitive and irreducible connections between properties.⁸ However, I do not know how such a claim might be worked out, and so will not consider it further.

In any case, although I find myself a bit uneasy about the general idea that law statements are necessities, this view of laws as entailments of dispositions seems to me still to be a live possibility. Lacking an analysis of dispositions, it is still incomplete, but such an analysis will, I suspect, be fundamentally subjunctive. That alleged fact will have some consequences, and we will come back to this view a bit later.

Law statements as quantified subjunctives

If law statements are required to support subjunctives, then there must be some close relationship between them, and some philosophers have been attracted to the position that statements of law simply *are* universally quantified subjunctives.⁹ Thus, the law concerning iron's expansion if heated might be

$$(12) \text{ any iron were it heated would expand}$$

i.e.

$$(13) (x) ((Ix \wedge Hx) \supset Ex)$$

(or perhaps

$$(14) (x) (Ix \supset (Hx \supset Ex)).)$$

That sort of view has several initially attractive features. First of all, (13) for example would support subjunctives trivially—being one itself. Second, law statements, on this view, would not be necessities, but would be stronger than material constructs. Traditionally, at least, that has been thought to be the logical space within which law statements are to be placed.

There are, however, some technical difficulties with this sort of view. I'm not entirely sure whether or not they are insurmountable. But in order to see

what some of them are, we must detour into some analyses of subjunctives. Surprises and surprising morals lie there, and many of them apply to the previous view as well (assuming, as I do, that the proper analysis of dispositions is fundamentally subjunctive).

Subjunctives and possible worlds

Serious attempts to analyze (or at least provide truth conditions for) subjunctives in terms of possible worlds began in the late sixties.¹⁰ (By that point it had become abundantly clear that no construct out of the connectives of standard first order logics would do.) The (simplified) basic idea is as follows. A given possible world, it is claimed, may bear closer similarity to some worlds than it does to others. And surely that is the case. We can imagine possible worlds only very slightly different from the actual world, as well as worlds wildly and bizarrely different from this world. Given the relative differences in similarity among worlds, we can rank other worlds in terms of their degree of similarity to this world (or to some other specified 'base' world), or, in other words, construct a similarity ordering among worlds. The proposed characterization in world terms for subjunctives was this: a conditional

(15) *were A the case, then B would be too*

is true in a world *w* if in the world most similar to *w* in the relevant respects and in which **A** is true, **B** is true as well—i.e. if the nearest **A**-world to *w* on the relevant similarity ordering is also a **B**-world.

The major proposals for world-analyses of subjunctives which followed the initial proposal differed in various ways, but were for all that basically variants of original theme. For instance, (among other differences) some analyses rejected the idea that there could be a uniquely closest **A**-world (in the above case) either because the ordering might only be partial (there might be ties in the similarity ranking) or because there was no **A**-world such that it was true of it that it was a closest **A**-world—for any **A**-world there was always a closer (although the sequence of **A**-worlds could be bracketed in the same way that a function which approaches a limit can be, and so forth).¹¹ But in these cases as well, the key was relative position on a similarity ordering, an ordering which was founded upon similarity in certain respects to the base world. The squabbles were not over the fundamental intuition, but over the technicalities of the logical fine-structure of the ordering, and whatever consequences that might have for the truth conditions for subjunctives.

So worlds can be ranked by relative similarity and the truth conditions for subjunctives can be given in terms of the truth value of the conditional's consequent in a specified world, worlds or sequence of worlds, in the ordering

(either complete or partial) in which the conditional's antecedent was true.

Exactly how all this is supposed to go was not, perhaps, quite clear. For instance, was a world like this one except with one extra tadpole more or less similar to this world than was one like this one except with one less butterfly, in cases where what was at issue was what would happen were I to heat a piece of iron?

Moreover, exactly how the orderings work is not entirely settled either. One intuition is that there is exactly one similarity array (for any base world), the location of any world in that array determined by some (perhaps primitive) global index of similarity *überhaupt* for that world. Thus, although world *a* may be more similar to *b* than is *c* in some particular *respects*, and although *c* may be more similar to *b* than is *a* in some other *respects*, the similarity ordering relevant to the truth or falsehood will represent some index of *overall* similarity, not directly tied to any particular set of respects. Another intuition is that similarity orderings are generated according to specific respects of similarity—some worlds are more similar than others in some respects, less similar than others in other respects. Thus, *different* orderings would be generated according to different respects of similarity, generated by in effect holding constant some features of the base world while making changes necessary to make true the antecedent of whatever subjunctive was in question.

Those differing intuitions result in different ways of viewing what is sometimes called the “pragmatic ambiguity” of subjunctives. Consider the following counterfactual:

(16) Had Caesar been in command in Korea he would have used the Bomb

Is (16) true or false? Obviously true, some might say. He was exactly that sort. Obviously false, others might say, because what is true is

(17) Had Caesar been in command in Korea he would have used catapults

The dissonance between the asserters of (16) and those of (17) pretty clearly involves some background matters—Caesar's actual favoritism toward catapults, versus his actual propensity to use the best firepower available. The problem here, on the “respects” view, is over which respect to hold constant in generating the relevant similarity ordering which will determine which world is nearest, a different world being nearest on the different orderings. On the “*überhaupt*” view, the dispute is over which of Caesar's propensities to build (tacitly) into the antecedent, a different world being nearest for the two different antecedents. (We will here pointedly ignore compromise positions such as: had Caesar been in command in Korea he would have launched the Bomb by catapult.)

For present purposes we do not need to settle on either the “respects” or the “überhaupt” intuition, since all the points of present relevance hold for both. First, the two will be extensionally equivalent. The überhaupt ordering and the specific orderings generated by reference to various respects are related in such a way that for any worlds a and b , respect of similarity R , and proposition A , if a is the nearest A -world to b on an ordering generated by reference to respect R , then a is also the nearest $A \& R$ -world to b on the similarity-überhaupt ordering. In fact, this bare überhaupt ordering is also (I suspect) one determinant in the generating of the orderings according to respects, being part of the matrix out of which they grow. (The above does not, however, entail that the entire orderings will coincide. But even if they do not, that will not affect the extensional equivalence.) Thus, any subjunctive will be assigned the same truth, at a given world, whether we take the constants as part of the expanded antecedent (überhaupt) or as generative of a specific similarity ordering (respects).

Second, the similarity arrays will be rigid on either view. By that I mean that on either view it will be either necessarily true or necessarily false that

- (18) *given* an ordering, the nearest world to the base world in which
(say) A is true will (will not) be a world in which B is true.

That is not, of course, to say that the subjunctive itself will be modal, but that once the ordering is laid down, however that is done, then the truth or falsehood of the subjunctive *follows* from that ordering by necessity. From any fully specified ordering generated by (inter alia) holding some respect R as a constant, the truth value of $A > B$ *follows*. And from the correlate überhaupt ordering, exactly the same truth value *follows* for $(A \wedge R) > B$. That entailment of truth value (or the necessity of the whole “corresponding conditional”—a conditional with a specification of ordering as antecedent and the subjunctive as consequent) is, again, what I mean by the rigidity of the orderings, and we have such an entailment on either view. In what follows, I will adopt the “respects” locution for convenience.

Quantified subjunctives: some semantics

Returning now to the matter of the structure of law statements, consider as a candidate the simple universally quantified subjunctive

- (19) $(x)(Ax > Bx)$

How do we analyze (19) in world terms?¹²

(19) does not point us to any particular world. It tells us, with respect to each actual object in the world, that in the nearest world where it is A , it is also B . There is, of course, no reason whatever to think that the nearest world where

object *a* is **A** is the same world as the nearest one in which object *b* is **A**, and so forth. Otherwise, the nearest world in which anything was **A** would have to be a world in which everything (in this world) was **A**. Thus, it points us to an enormous number of worlds. But one problem with (19) as a law analysis is that it doesn't for all that point us to enough worlds. When we espouse, say, some law of gravity, we do not mean it as having (loosely) application only to the things that in fact exist. We also take as an implication of the law that had there been one more rock in the world (which rock in fact doesn't exist) that it would have fallen if released above the ground and so forth. But, of course, since the above quantifier ranges only over existing objects, we never get directed to worlds other than worlds in which objects existing in this world are dropped.

In fact, for all I know, it may be some sort of biological law that had there been any unicorns, they would have had more than some number *n* of optic fibers for each square millimeter of retina. And that might be a perfectly respectable law, despite the lamentable absence of unicorns in this world. Here again, something of the form $(x)(Ux \supset Nx)$ won't do. It isn't just that Spot (and other things in this world) would have had that feature had *he* been a unicorn, but that *had there been* any unicorns at all (whether or not any of them would bear any connection to things in this world), *they* would have had that optic characteristic.

But that form too

(20) had there been any unicorns all of them would have had that optic characteristic

fails rather decidedly. It seems to direct us to the nearest world in which there are any unicorns at all, and then tell us to see whether or not all the unicorns in that world are so optically equipped. But even if they are, there seems no reason to think that to be decisive. For one thing, we are checking only one world (the closest unicorn-containing world). Why should we think that if it happens (perhaps *accidentally*) to be true in that world that all (one?) unicorns in that world are as described, that that (single) unicorn in that world having a characteristic makes it a law in this world that unicornicity is accompanied by that characteristic? Perhaps in the nearest world in which there are unicorns, it is object *a* that gets to be the unicorn, and *a* is **F**. But suppose that in the nearest world in which object *b* gets to be a unicorn, *b* isn't **F** at all. Why ought *a*'s greater nearness in unicornicity make *any* other accidental characteristic *a* has in his unicorn mode a lawful characteristic of unicorns? And that is exactly what happens in this situation.

Perhaps a better way of approaching the question would be in terms of quantification over individual essences—a view which some maintain is the only way to talk sensibly about things in worlds anyway.¹³ Thus, the universally quantified form of the relevant statements might be

(21) (e) (were e co-instantiated with A, then e would be co-instantiated with B)

(Notice that if law statements are property entailments they are already implicitly quantified in just this way. If the specified entailment does hold, then anything having the first property in any world will also have the second.) Suppose we try (21) in world talk. Here again, it will frequently be the case that the nearest world in which essence e_1 is co-instantiated with A will be a different world from the nearest one in which essence e_2 is co-instantiated with A. We will thus, again, have to canvass a huge range of different worlds, to see whether or not all the essences get co-instantiated with B as well. But at least here the quantifier will range over all the right items in all the relevant worlds—neither of which happens on some of the other methods.

But although I am not sure what to make of it, there is at least an oddity here, and it is perhaps a glimmer of the special nature of laws (as a consequence, I suspect, of orderings being based (*inter alia*) on laws).

It is perfectly possible that the nearest world, w_1 , in which, say, e_1 is co-instantiated with A is also a world in which e_2 is co-instantiated with A, but which is not the nearest world in which e_2 is co-instantiated with A. That being the case, although e_1 is B in its nearest A world (provided the claim holds), and although e_2 is B in its nearest A-world, e_2 can exist in w_1 quite happily alongside e_1 (or its exemplification) being both A and not-B. So the connections between A and B need not be *necessary*, and need not even *hold* in *all* the *worlds* relevant to the determination of truth value for the original quantified conditional. Yet the fact that worlds are clustered about the base world along *all* the relevant orderings in the way they are (with the first appearance of an A-exemplification by any given essence being a B-exemplification as well) certainly indicates that the connection between A and B is not sheer accident.

Subjunctives and ontology

The next point to be noted is that despite the rigidity of the ordering, despite the necessity of all fully specified corresponding conditionals, some orderings are privileged. For instance, consider the subjunctive

(22) *were I to release this chalk, it would fall.*

We can evaluate that with respect to innumerable different orderings (or, alternatively, we can fill out the antecedent in a variety of ways). Suppose we choose to hold constant all the relevant laws of nature, etc., etc. On the resultant rigid ordering, the corresponding conditional (not the subjunctive consequent) is necessary, and the above subjunctive presumably comes out true. But suppose we

were to hold constant (among other things) the present position of the chalk. In other words, suppose we ordered worlds with respect to (again, among other things) their similarity to this one in terms of the present location of the chalk. The resultant ordering will again be rigid, and the corresponding conditional (not the subjunctive) again necessary. The subjunctive in this case would presumably be false. Thus, we have two different, inconsistent, equally rigid orderings, and two distinct but necessarily true corresponding conditionals. But it is perfectly evident that only one of those corresponding conditionals is 'activated' in some sense. One of the orderings makes a difference, and one doesn't—despite the rigidity of both. One of them (or at most one) somehow represents the 'real' ordering of worlds. In fact, we likely know which one it is. If I release the chalk we'll see it fall, despite the rigidity of the ordering and the necessity of the corresponding conditional associated with the ranking built around similarity to the actual present location of the chalk five feet off the ground.

So obviously, again, some orderings are privileged. What that amounts to is that there is some real ordering of worlds, there are some subjunctives whose generative similarity respects are in some sense normative or binding. Others aren't.¹⁴

What is it that determines which orderings, which things held constant, get the world's attention? It certainly does not seem to be a matter of necessity. What it seems to be at least in part is a matter of law—whether physical, or whatever. What makes a world in which I release the chalk and it maintains its position five feet off the ground more distant (other things equal) than a world in which it falls is that the former world is different in respects which have real importance—among them that it has different laws, even though the chalk has the same location as it now does in this world (where I haven't in fact released it).¹⁵

It thus looks as though if we are going to analyze subjunctives (whether simple or buried in dispositions) in terms of world similarities, laws are going to have to be prior in some sense. In fact, that priority is even suggested in the common phrase that "laws support subjunctives", instead of *vice versa*.

It is even reasonably clear in that light why law statements support subjunctives. Suppose that there is a lawful connection between **A**-type events and **B**-type events. If that law is a part of the collection of constants, then the nearby **A**-worlds in most relevant orderings will be ones in which the law—i.e., the connections between **A**'s and **B**'s—holds. Since the nearest **A**-world is obviously an **A**-world, and since the law presumably holds in that **A**-world, then **B** will have the relevant status in that **A**-world as well. Thus, on the relevant ordering, the nearest **A**-world will be (say) a **B**-world as well, and the claim that *were A the case, B would be too* will indeed be true in the base world—i.e., the law will support that subjunctive. But again, the law comes first ontologically, and is responsible for the truth of the subjunctive. Thus, any attempt to *reduce* law

statements to ordinary universally quantified subjunctives does not appear promising. Such attempts will be seriously circular.

(Of course, nearness apparently isn't based just on laws. For instance, it seems perfectly possible that some world with some difference in law so minute that it effects only the configuration of one snowflake per century might be more similar overall to this world than is one which shares all the same laws, but in which some allegedly random quantum event early on resulted in birds being the highest life form on earth as e.g., S. J. Gould thinks was a possibility.)

The same point applies to the dispositional property view. If dispositional properties are in some basic sense tied to subjunctives, or have subjunctive analyses, what is the ontological underpinning of those subjunctives? What connects the relevant categorical properties in the requisite way? Why do fragile things *shatter* when *hit*? Why does iron *expand* when *heated*? The usual explanations of those facts involve micro-reductions to some underlying causal affairs. For instance, heat iron and the iron molecules tear around a bit more vigorously, rush at each other a bit more vigorously, and just naturally push or repel each other farther away, hence expansion. But surely more vigorous pushing does not *logically* entail expansion. What is the connection? We could pursue the micro-reduction down a few more levels, but the same type of question will eventually emerge and have to be addressed: what is the connection between the properties in question? We could, of course, in the above case simply say that iron molecules are (essentially) the sorts of things that rebound when pushed, i.e., that they have a reboundative virtue (or worse, a repulsive virtue). Not only does that not seem to get us very far, but that seems to turn the kind property *iron* into something itself implicitly dispositional, and we seem to have compounded the very problem we're trying to deal with. Alternatively, we could say that (at whatever ultimate level of micro-reduction we stop) the properties in question are simply linked in the requisite lawful manner. But that too, seems to represent little progress, since the starting point for all this was the question of what laws and law statements are. Thus, it looks as though causal powers views, whatever their merits, are seriously incomplete. On any plausible rendering, they require appeal to dispositional properties, and the only plausible analyses of dispositions involve subjunctives, and the only plausible analyses of subjunctives involve presuppositions about laws. We seem to be led into the same sort of circularity that more straightforwardly subjunctive views lead into.

Ontology again

It thus seems to me that the question of what undergirds the subjunctives that lie near (or at) the heart of various views is ultimately inescapable regardless of which of the last two views we accept. But it might, again, be proposed that

something explicitly or implicitly subjunctive gave the logical structure of law statements, but that those subjunctives were somehow primitive and did not in turn depend upon prior law in the generation of similarity orderings among worlds, and that the proposal is thus not ultimately circular.

First, making out exactly what the claim involves and how it is to work might be difficult. (Goodman, I take it, despaired of essentially this project.)¹⁶ What might the orderings rest upon? Any position without a good answer to that question makes there being any lawful regularities at all almost incredible. Suppose we put it in world terms again. For instance, for a universally quantified subjunctive to be true, there must be an ordering upon which, e.g., every object which shows up in any world in the ordering as an **A**, also be a **B** in the *first* world in which it shows up as an **A**, although it can do anything else it pleases elsewhere. Having that turn out to be the case not only with every essence of the relevant sort which is exemplified in this world, but also with objects which don't show up in this world as well, seems incredible enough. Having it happen with respect to numerous laws which have various interconnections with each other seems even more incredible. And having that turn out to be the case in a way which doesn't depend upon prior law, plan or some such other thing is very nearly beyond belief. Without any reasonable backing such subjunctives begin to look like interworld correlates of monumental accidental generalizations, should there even turn out to be any true ones.

Construing law statements as *ordinary* universally quantified subjunctives, although having some virtues, won't help us answer the questions at hand. Nor will construing them as entailments among dispositions. (There are also a number of more technical considerations and difficulties having to do with what inferences do or do not hold for quantified subjunctives, which I have developed in some detail elsewhere.)¹⁷

A possible foundation

Standard subjunctives, then, whether universally quantified, buried in dispositions or natures or not, do not seem promising candidates as the source of the peculiar logical character of laws. One of the reasons, again, is that subjunctives normally themselves depend partially upon natural laws for the firmness of character they have. Despite that, I still find the basic idea that laws are fundamentally subjunctive and that the character of the relevant subjunctives is in some sense prior to generalizations of properties of objects quite attractive on alternate days. Is there any way to give laws priority over properties, maintain the subjunctive character of law statements (and not merely their 'support' of subjunctives) and avoid any sort of pernicious circularity?

I think that the answer may be yes, and that the key is to be found in the fact

that there is one kind of subjunctive which does not depend wholly upon prior natural law, thus offering a possible escape from the regress—what Plantinga has called ‘counterfactuals of freedom’.¹⁸ Counterfactuals (subjunctives) of freedom are subjunctives having to do with freely chosen actions of agents, e.g.,

(23) *were Jones to be offered the chance to buy a stolen horse he would resist*

If we do have freedom of a substantive sort, then the truth of such subjunctives is not purely a matter of either necessity, natural law or chance, but is a matter of free choice, character and so forth. And the more stable and firm and reliable the character of the agent in question, the more general such subjunctives will be. Thus, for an absolutely reliable character, there would be counterfactuals of freedom of a universally quantifiable sort. Such subjunctives—even for an agent with absolutely reliable character—would nonetheless still not be law-based subjunctives, nor would they be purely arbitrary. They would be agent-based, or character-based subjunctives.

But (to slip back into the world talk) what would be the determinant of what is held constant in the generating of the relevant ordering for such subjunctives? Can there be any ground of the required sort which lies between lawful or logical determination on the one hand, and caprice on the other? Philosophical anthropologists (and who isn’t?) have long fought over the status of human actions. It was once widely argued that there was nothing between the poles of rigid determinism and random chance—neither one, of course, conducive to or compatible with human freedom. What was needed, clearly enough, was some way of locating human actions between those two poles (and notice, incidentally, how those poles of determinism and chance at least parallel the old legal dilemma between necessity and accidental generalization). One proposed answer was the notion of agent causation—that genuine persons could cause events although not in turn caused to do so, and not as a consequence of purely random antecedents. Persons could *initiate* causal chains (thus not be mere cogs in previously developing chains, or bound by causal chains) for *reasons* (thus not randomly) which were themselves not causally determined.

So the notions of character and agent causation might provide a source of some of the major constants around which subjunctives pivot, but a source not in turn based upon antecedent laws—the feature of regular subjunctives which would make the attempt to reduce law statements to some construct of such subjunctives circular.

Thus, we could have a stable, ‘real’, ordering which would support subjunctive predictions, expectations, Goodmanian projections and so forth, and which would not involve a circularity, if we had the right sort of agent, whose choices and character were normative for reality—i.e., whose constant character would deter-

mine the constants which are determinant for which orderings are 'real'—some of those being universally quantified subjunctives (or counterfactuals) of freedom—and which consequently would determine which "ordinary" subjunctives are true.

Attributing the choice of constants to an agent would also remove the otherwise radical implausibility of an ordering of worlds in which for a variety of pairs of different features, the *first* time *any* object exemplifies the first of a pair of features in the ordering, it also exemplifies the second in that world, even though the relationship might not hold at other worlds. That's a nifty sort of pattern. An agent might well find it attractive. If laws indeed involve universally quantified subjunctives in some way, then human agents who are scientists certainly might find what cashes out as that pattern in world talk attractive—hence their talk about the beauty of physics, their wonder that the world falls into elegant mathematical patterns, and so forth. Agents typically find that sort of thing absorbing.

And if we take this sort of view of natural law—law as involving constructs of universally quantified subjunctives of freedom—then what is or isn't natural law will be independent of the role its statement plays in any of our deductive systems, our best systems of explanation, and so forth. Law will be something objectively 'out there' whether we get it right or not—exactly the right result, it seems to me.

So the notion of agent causation (falling between determinism by prior law, and caprice) as a source of the constants (including these subjunctives of freedom) which determine what orderings are binding on the world and which aren't, which in turn determines which universally quantified ordinary subjunctives are true and which aren't, which dispositions are exemplified and so forth, looks initially as though it gives us quite a number of the features we need. What is required is an agent with a thoroughly stable character who freely governs the relevant parts of reality. Surely a reasonable request.

The cat, of course, has long since left the bag. This view in some form or other is what many Christians have been espousing for years—that natural laws are expressions of a faithful God's free governance of the world.¹⁹ On this view, all activity other than creaturely free choices is God's activity, and all subjunctives other than those of (individual or group) freedom turn out to be stipulations of how God either does act or would act in given circumstances. What makes an **AB** world nearer than a **A $\bar{B}$** world? That in the relevant circumstances (**A**) God would freely perform an action which would bring about (or constitute) actuality's following a **B** track rather than a **$\bar{B}$** track. Were I to drop this chalk, God would bring it about that it fell.

This sort of view, it seems to me, has quite a number of attractions. It locates laws in what many have seen as the right general logical location, between

categorical necessity and accident. It also avoids subjectivism, relativism, and circularity. It can also be adjusted to handle quite nicely the intuition shared by many that God could have decreed at least slightly different laws even had He created the same objects He in fact did, an intuition usual causal powers views do not wish to accommodate and apparently cannot in any case. If kind properties entail dispositional properties, and if those entailments or entailed dispositions either are or underlie laws, then objects essentially of specified kinds could not be created subject to different laws.

On the other hand, it might tend toward the occasionalist end of the spectrum, since all natural events turn out to be activities of God's governance. Some may see that as objectionable—surely God doesn't get directly involved with, say, the movements of my arm. But many Christians have long believed that God is at every moment upholding His creation in such a way that without that immediate upholding the creation would cease to exist. The present type of occasionalistic view is not far removed from that, and if that doctrine of God's upholding the creation is right, then God's involvement at least with the existence of the arm that I move is already quite immediate.

Further, this view would make God's providence more immediate as well, and would fit with a conception of miracles as being fundamentally of a piece with all the rest of God's activity in a way that many other views would not. That, too, some might see as an attraction.

And finally, there have been philosophers who have argued that our concepts of *cause*, *power* and so forth have grown out of our own experiences as agents who cause things, who have various powers. If those concepts are indeed fundamentally agent-concepts, then in attributing them to other sorts of objects we may be anthropomorphizing nature (or agentomorphizing it) whereas a more occasionalistic, agent-based view, may have some inherent conceptual advantages.

Some advocates of causal powers views have seemed to feel that putting all the causal weight onto a dispositional property of an object escaped the hazards of occasionalism. Perhaps that is the case, but if what I have said about disposition is right, that distance from occasionalism may be illusory. *Something* has to account for the connection between the properties tied together in a disposition, and if it isn't simple entailment, if sheer accident won't do, if law simply begs the question, then what is it? If it is in fact an activity of God's freedom, then God is involved in the breaking of struck glass, the expansion of heated iron—and the raising of my arm when I will it appropriately. Of course, it may be that the proper analysis of a subjunctive is neither categorical nor subjunctive, but no one has provided any clues as to what it might then be (although there are extensional equivalents in the literature).

There remains one substantial incompleteness. The present view requires both

thoroughly reliable, uniform character and nearly limitless freedom and choice within the same divine agent. But exactly what is the relationship among character, choice and freedom? Does character determine choice? If so, are such choices free (since not determined by any sort of law or mechanism either external or internal) or not (since, albeit by one's own character, still determined)? Are free choices merely freely in accord with character? Is character reducible to collections of free choices or sets of subjunctives of freedom? I do not claim to know the answers to all those questions, but it does seem to me clear that in any agent, creaturely or divine, things do go together in such a way that reliability of character is not destructive of freedom—a person's being of good moral character is hardly warrant for denying that person morally significant freedom.

With any view of the sort I'm suggesting, there will be, of course, two further hitches for some. One, accepting this view requires belief in God, and two, it requires acceptance of the idea of agent causation. But those are, I think, relatively minor hitches. All of us have had direct experience with the latter, and most of us, I suspect, have had experiences with the former, denials notwithstanding.

Various people used to argue (and some still do) that laws always require lawgivers, arguing from that claim and the existence of natural law to a Lawgiver. That was widely perceived as laughable philosophical confusion—at best a bad joke. A joke it may have turned out to involve, but not necessarily either a bad one or one on whom it was originally thought to be.

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NOTES

1. I am indebted to my colleagues in the Calvin College Philosophy Department, especially Ken Konyndyk, for more discussions of this paper than some of them thought strictly necessary. I am also indebted to several contributors to this issue of *Faith and Philosophy*, especially Chris Menzel and Nick Wolterstorff as well as to the general editor, William Alston. I am most ferociously indebted, however, to Alvin Plantinga.

2. See, e.g., Frederick Suppe, *The Structure of Scientific Theories* (Urbana: Illinois, 1977), and Harold Brown, *Perception, Theory and Commitment* (Chicago: Chicago, 1977).

3. This is the necessity Scylla to the accidental generalization Charybdis in the traditional dilemma.

4. Ernest Nagel, *The Structure of Science* (New York: Harcourt, Brace and World, 1961), p. 68, and David Lewis, *Counterfactuals* (Cambridge: Harvard, 1973), p. 73.

5. R. Harre and E. Madden, *Causal Powers* (Oxford: Blackwell, 1975).

6. Carnap's well-known views here are discussed in e.g., Carl Hempel, *Aspects of Scientific Explanation*, (New York: Free Press, 1965), p. 109. For a more recent attempt, see F. Wilson, "Dispositions: Defined or Reduced," in the *Australasian Journal of Philosophy*, 47, 1969, 184-204.

7. See, e.g., Elizabeth Prior, Robert Pargetter and Frank Jackson, "Three Theses about Dispositions," in *American Philosophical Quarterly*, 19 No. 3, July 1982, 251-57. These three have published other works on this issue as well.

8. For general discussion, see E. J. Lowe, "Laws, Dispositions and Sortal Logic" in *American Philosophical Quarterly* 19 no. 1, January 1982, 41-50, and also his "Sortal Terms and Natural Law: in the same journal," 17 No. 4, October 1980, 253-260. Also of interest is Elliot Sober, "Dispositions and Subjunctive Conditionals, or, Dormative Virtues Are No Laughing Matter", *Philosophical Review*, XCI No. 4, October 1982, 591-96.

9. For instance, Robert Stalnaker, "A Theory of Conditionals," reprinted in Ernest Sosa (ed.), *Causation and Conditionals* (London: Oxford, 1975), p. 177.

10. Stalnaker, *op.cit.*, p. 165-179.

11. For instance, David Lewis *op. cit.*

12. Quantified subjunctives have been explored in only a very few places, for example: John Pollock *Subjunctive Reasoning* (Dordrecht: Reidel, 1976), Peter van Inwagen, "Laws and Counterfactuals" in *Nous*, 13, 1979, 439-453, and a few remarks of David Lewis in *op. cit.* I know of no discussions of quantified subjunctives in world terms except my "Quantified Subjunctives, Modality and Natural Law," forthcoming in David Austin (ed.), *Philosophical Analysis: A Defense by Example*, (Reidel, 1987).

13. Alvin Plantinga, "World and Essence," *Philosophical Review*, 1970.

14. See also Alvin Plantinga, *The Nature of Necessity* (Oxford: Oxford, 1974), Chapter IX.

15. *Ibid.*, Chapter IX.

16. Nelson Goodman, *Fact, Fiction and Forecast* (Cambridge: Harvard, 1955).

17. See my, *op. cit.*

18. Plantinga's original discussion of the concept (although not the terminology) is in *ibid.*, Chapter IX.

19. Francis Oakley discusses some historical views in this region in Chapter 3 of *Omnipotence, Covenant and Order* (Ithaca: Cornell, 1984).