# Lange on Essentialism, Counterfactuals, and Explanation[1]

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## Abstract

Marc Lange objects to scientific essentialists that they can give no better account of the counterfactual invariance of laws than Humeans. While conceding this point succeeds *ad hominem* against some essentialists, I show that it does not undermine essentialism in general. Moreover, Lange's alternative account of the relation between laws and counterfactuals is – with minor modification – compatible with essentialism.

## 1

As Marc Lange [2004] characterises scientific essentialism, it is a position which aims to explain a fact about counterfactual reasoning. The explanandum is:

(1)    Laws are invariant under counterfactual (CF) circumstances.

And the explanans offered by essentialists is:

(2)    Laws are made true by the essences of the natural kinds which exist.

A consequence of (2) is:

(3) The laws are metaphysically necessary.

It is obviously the case that, if the laws are metaphysically necessary, they are invariant under counterfactual suppositions. But Lange has a reasonable enough criticism to make of this "explanation". It only goes part of the way. For there are some counterfactual circumstances – especially counterlegal circumstances –

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where the laws of this world may be true, but only vacuously so. That is, the natural kinds which exist at a counterfactual world may be alien to this world. So the laws which are actually instantiated by the counterfactual world are utterly different. The laws governing charge, mass, and so on, are still true, but they are merely vacuous generalizations.

In many counterfactual circumstances, however, the essentialist is not willing to entertain the existence of such alien kinds. They require not only that the laws remain invariant under counterfactual circumstances, they require that the laws be invariantly *non-vacuous*.

Call this the refined explanandum:

(1′)  Laws are invariantly non-vacuous under many counterfactual circumstances.

And it is quite right that (2) alone does not adequately explain (1′).[2]

**2**

Lange considers an example such as:

> Had there been an electron at L, then every proton would still have possessed a mass of $1.673 \times 10^{24}$ grams.

He asks the essentialist to explain, in virtue of what is a counterfactual like this true?

The essentialist will presumably reply that it is an essential truth about protons that they possess that particular mass. But Lange asks: in virtue of what is it true that, had there been an electron at L, there would still have been protons, not schprotons (proton-like particles with a different mass)? Further appeals to the

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[2]A broadly similar sort of objection is made to essentialism in Fine 2002, although Fine's emphasis is on the concept of necessity, rather than upon counterfactuals and laws.

essences of other natural kinds with necessary connections to protons (*atoms*, for instance, or *matter*) will simply generate another question: why must *that* natural kind exist in these counterfactual circumstances, when there could have been an alternative kind with different essential properties?

In effect, mere necessary laws about protons having a certain mass are not sufficient to explain the truth of this counterfactual. What is needed is that the law be *instantiated* in the counterfactual circumstances. Hence, the demand that the essentialist not merely explain (1) but explain (1').

The obvious strategy for the essentialist, in my view, is to use a similarity metric, much like the one used by neo-Humean counterfactual theorists, such as David Lewis. But the way Lange characterises the essentialist's position, it would be hypocritical to do this. Lange says that essentialists believe the similarity metric of Lewis, combined with Lewis's account of what laws are, is "ultimately *ad hoc*, unprincipled, nothing but a naked stipulation" [2004: 228]. I do not pretend to know every reason that essentialists have ever advanced for their theory, but I propose that the following sketch will suffice to give it some plausibility, and will also suffice to show that essentialists do not need to adopt such a strongly anti-similarity account of counterfactual reasoning as Lange implies.

Why be attracted to the idea that the laws are necessary in the first place? I suggest that the essentialist's argument should be: the laws are necessary because this gives an explanation of nomic phenomena, including CF-invariance, which is better than any that has been offered by anyone else. Why is it thought to be a good explanation?

First, NAÏVE REGULARITY THEORIES fail spectacularly to accord with our counterfactual reasoning. That is, too many propositions which appear to be mere accidental truths would be deemed laws.

SOPHISTICATED REGULARITY THEORIES (such as Lewis's) have a high degree of accordance with our counterfactual reasoning, but the accordance does not seem to be perfect. As defenders of Humean supervenience are well aware, there are some cases that strike anti-Humeans as deeply counter-intuitive (Carroll's [1994]

mirror case, chance-involving cases [Bigelow, Collins, and Pargetter 1993], etc.). It seems that Humean views will necessarily have such features. One can summarize this feature as: "Laws depend on accidents". That seems wrong.

Finally, NOMIC NECESSITATION – or DTA – accounts of laws, such as those of Dretske, Tooley, and Armstrong, have been derided as either "mysterious" or invoking necessary connections between distinct existences. The idea of a contingent necessity, also, has struck some critics as paradoxical.

Given the alleged deficiencies of these alternative explanations, the essentialist explanation is held to be superior. (Personally, I find the advantages of most necessitarian accounts of laws over DTA theories to be marginal. As far as I can tell, the essences of natural kinds which underwrite the metaphysically necessary laws are no less mysterious than the relation of nomic necessitation [Handfield 2005].)

This still leaves the problem, however, of explaining why the same natural kinds exist in counterfactual circumstances. And here I think that the essentialist should simply say: counterfactual evaluation requires judgments of similarity much like those which are part of Lewis's account. In our case, however, the high weighting that Lewis gives to minimising divergences from the actual laws becomes redundant: there are no worlds where the actual laws are violated. What is required, however, is to give suitable weighting to similarity of natural kinds.

Is not this stipulation *ad hoc* and unprincipled? I do not see that it is. It seems to be an intuitively plausible fact about our judgments of similarity that they are highly sensitive to sameness of natural kinds. We need not insist that counterfactuals always be evaluated in worlds with precisely the same kinds as our own. That would be too restrictive, and would rule out all counterlegal conditionals. But we may reasonably require that worlds with greater overlap of

natural kinds be closer than those with less overlap of natural kinds.[3]

Once it has been emphasised that the essentialist criticism of other accounts of laws need not be based entirely on a failure to explain the CF-invariance of laws, but merely that they give an inferior explanation of nomic phenomena more generally, it is not hypocritical for the essentialist, like her rivals, to appeal to facts about similarity as I have done above.

Lange's primary argument, then, is successful only as an *ad hominem* against those essentialists who claim that the metaphysical necessity of the laws is sufficient to explain the non-vacuous counterfactual invariance of laws.[4]

**3**

In the final section of his paper, Lange develops his own account of lawhood.

Lange suggests that lawhood can be *defined* in terms of non-nomic stability: a sort of invariance under counterfactual suppositions. I think, moreover, that he does a good job of showing that this definition accords better with the intuitive conception of lawhood than the essentialist conception as a necessary truth. In effect, Lange's positive account rebuts the charge that the idea of a contingent necessity is paradoxical.

But what is the truthmaker for a set's possessing non-nomic stability? That is, what in the world makes it the case that some propositions are invariant under

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[3]I make an attempt to develop an account of counterlegals that is compatible with essentialism in Handfield 2004.

[4]Lange is aware that essentialists have other arguments to support their view [2004: 227–8]. And there are certainly essentialists who do not endorse the argument from CF-invariance. Stephen Mumford [2004], to take one extreme, is an essentialist of sorts who does not believe there are any laws at all! Clearly, the relation between laws and counterfactuals cannot be one of *his* reasons for adopting essentialism.

counterfactual suppositions and some are not? Here Lange is quite frank: he takes some counterfactual truths to be primitive, "like the truth of certain actuals" [2004: 240].

The essentialist, in contrast, has tried to give a *truthmaker analysis* for counterfactual propositions and the like. And there is something rather bewildering about primitive counterfactual facts. I do not move that they are unintelligible, nor that such an ontology is incoherent. I do, however, think that it should at least be acknowledged that the essentialist has something to point to and say, "This is what makes these counterfactuals true: the essences of the natural kinds".

In effect, I have argued that the account of the relationship between laws and counterfactuals which Lange has criticised is not crucial to essentialism. Moreover, Lange's own, more subtle account of that relationship, unlike essentialism, gives no account of the truthmakers of those counterfactuals. Which suggests a happy compromise: the essentialist can keep her account of counterfactual truthmakers and wed it to Lange's account of lawhood as non-nomic stability. Lange's account of lawhood in no way undermines essentialism because it is *compatible* with essentialism.

While Lange's account assumes that the laws are contingent and an essentialist must deny this, the key point is that laws are only contingently *non-vacuous* truths. A Langean–essentialist theory of laws, then, might claim that it is a natural law that $p$ if and only if:

a.   $p$ is not a logical truth and

b.   $p$ belongs to a logically closed set $S$ of truths that non-trivially possess non-nomic super-stability, where $S$ is non-nomically super-stable iff:

   for any $m \in S$ and any $q, r, \ldots$ such that each is logically consistent with every member of $S$:

   i.      $q > (m$ is non-vacuously true)

*ii.*     $r > (q > (m$ is non-vacuously true$))$

and so forth for multiply nested counterfactuals.

Thus while Lange's point about the weakness of the argument for scientific essentialism from CF-invariance of the laws is well taken, it is not a significant blow to the essentialist position, because there are independent reasons to be an essentialist. Moreover, Lange's insights into the relation between counterfactuals and instantiated laws can be co-opted by the essentialist. Perhaps they ought to be.

## References

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