AGAINST INFERENTIAL RELIABILISM:
MAKING ORIGINS MATTER MORE

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Abstract: Reliability theories of epistemic justification face three main objections: the generality problem, the demon-world (or brain-in-a-vat) counterexample, and the clairvoyant-powers counterexample. In *Perception and Basic Beliefs* (Oxford 2009), Jack Lyons defends reliabilism at length against the clairvoyant powers case. He argues that the problem arises due to a laxity about the category of basic beliefs, and the difference between inferential and non-inferential justification. Lyons argues reliabilists must pay more attention to architecture. I argue this isn't necessarily so. What really matters for understanding and solving the case involves paying closer attention to the origins of our belief forming capacities, both inferential and non-inferential. Reliabilists should make origins matter more.

Keywords: Epistemic justification, evidentialism, reliabilism, inferential reliabilism, clairvoyance, Jack Lyons, hopeful monsters.

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John wakes up, opens his eyes, and looks out the window. Lo and behold, another sunny day. His beliefs (it's morning, it's sunny outside, it's sunny outside again, it's going to a pleasant afternoon) are surely all "justified."

Being justified in general means *being in the right*. This involves meeting some standard or norm for correctness. *Being justified* in epistemology means being in the right vis-à-vis the goal of believing truth and avoiding error. A justified belief then meets a standard or norm understood in terms of promoting truth and avoiding error.

Many traditional epistemologists connect justified belief to the individual's ability to justify her belief. This view has fallen on hard times for it overly narrows the scope of justified beliefs. Small children and many non-human animals have justified beliefs. But they lack the capacity to critically reason in support of their beliefs. John's beliefs may be justified even if he's only four years old.

There's no real doubt *whether* John's beliefs are justified. But there's a real philosophical issue accounting for *why* they are justified. Are they justified because they are based on *conscious* sensory perceptions, *conscious* episodes of propositions seeming to be true, and *conscious* episodes of one set of beliefs *consciously seeming* to support another?

"Experientialists" (evidentialists, mentalists, dogmatists, phenomenal conservatives) say yes, indeed, that's why they are justified. Our conscious, sensory perceptions, among other conscious states and events, explain why garden-variety beliefs based on perception, stored in memory, and extended through reasoning are justified. There is something about conscious, sensory perceptions and other conscious states and events that explain why they justify. Basing beliefs on "experiential evidence" is the standard by which beliefs are justified. Experientialists believe in the epistemological power of consciousness.

"Reliabilists" say no. The matter of fact (unconditional) reliability of perception—the fact that perception produces mostly true beliefs in our ordinary circumstances—explains why perceptual beliefs are (unconditionally) justified. The matter of fact (conditional) reliability of memory—the fact that memory reliably preserves beliefs previously formed in some other way—explains why beliefs stored in memory are (conditionally) justified. The matter of fact (conditional) reliability of reasoning—the fact that reasoning reliably transitions from true premises to true conclusions—explains why reasoned beliefs are (conditionally) justified. Getting things reliably right is the standard by which beliefs are justified.

Experientialists agree that perception, memory, and reasoning are reliable. They also typically agree that reliability matters to *knowledge*. But they reject the idea that the reliability of these processes explains why their outputs—perceptual beliefs, memory beliefs, and inferential beliefs—are *justified*. Experientialists see justification as a good "internal" fit between our beliefs and our conscious seemings

or experiences. Reliabilists, on the other hand, see justification as a good "external" fit between our belief-forming processes and the states of the world our beliefs represent.[1]

Enter Jack Lyons. If anyone is a dyed-in-the-wool reliabilist, Lyons is. And if anyone can't stand experientialism, Lyons can't. In *Perception and Basic Beliefs: Zombies, Modules, and the Problem of the External World* (Oxford, 2009), Lyons takes on two main tasks: wage war against experientialism and develop and defend reliabilism.

Let us assume, for the sake of argument, that Lyons is right about experientialism. Let's also assume, for the sake of argument, that reliabilism is the only plausible alternative. Does it follow that our work is done? Hardly. For Lyons and I agree (along with many others) that reliabilism faces a number of problems to overcome. Even if experientialism is dead in the water, reliabilists still have work to do.

Lyons takes up the clairvoyant-powers problem in his book and the new evil-demon problem in a follow-up essay (Lyons 2012). In this paper I'll critically engage, from a reliabilist perspective, Lyons treatment of the clairvoyant-powers case, putting experientialism entirely to one side.

Lyons argues for two theses. First, that the clairvoyant powers case arises due to an unfortunate "laxity" among reliabilists about "inferential justification." Second, that in order to solve the problem, besides paying more attention to the difference

between inferential and non-inferential justification, we need to add an "etiological" or right "origins" condition on justified belief.

I shall argue for two counterpart theses. First, the problematic clairvoyance cases really arise because they've got the wrong kind of origin, not because reliabilists have been lax about the inferential vs. non-inferential distinction. Second, because the problems arise due to wrong origins, Lyons needs to say considerably more about why the origins he cites really matter. "Laxity" about "inferential justification" is a red herring; what really matters is unacceptable laxity about origins, and Lyons's own discussion of origins, unfortunately, is unacceptably lax. Reliabilism needs a good account of why origins matter, and Lyons fails to provide one.

I. THE TROUBLE WITH SIMPLE RELIABILISM

In his 'Response to Critics' Lyons indulges in some useful autobiography:

> This project started off in my mind as a way of solving a problem for reliabilist theories of justification, namely, their unacceptably lax treatment of…inferential justification. Clairvoyance cases are just the tip of an iceberg: it seems undeniable to me that some beliefs require argument, that they require inferential, or doxastic support, if they are to be justified. "Simple reliabilism" holds that reliability is sufficient for *prima facie* justification, thus, in essence, denying that any belief requires inferential support. But

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take any hard-won item of science or philosophy: the belief that reliabilism is true, that bats are more closely related to primates than to rodents, that the moon is 2178 miles in diameter, and so on. There are many more: my belief that it's likely to rain today, that Christmas is going to be on a Thursday this year, etc. These are beliefs that—for us, at least—require inferential support. *Any* theory of justification that doesn't explicitly single out a class of beliefs as requiring doxastic/inferential justification is in danger of refutation from such examples. (2011b: 477)

Here is Lyons's recipe for these examples:

RECIPE ONE: First, take any belief that is clearly only justified inferentially *for us* if justified at all; take any "non-basic" belief you please. Second, stipulate that one of us, by some fluke, mutation, or even benevolent intervention, acquires a reliable process that causes a belief like that without any inferential support from other justified beliefs or any other "evidential" support. That belief so formed, clearly, is not *prima facie* justified.

The two most famous examples are Bonjour's Norman (Bonjour 1980) and Lehrer's Truetemp (Lehrer 1990). Here's a detailed version of Bonjour's case, with everything the experientialist cares about screened off.

NORMAN, an otherwise ordinary four-year old boy, just so happens to have a reliable "clairvoyant" belief-forming cognitive system in his head with hidden sensory

transducers, due to some bizarre and completely random mutation or neurosurgical prank. This process reliably induces true beliefs about the whereabouts of the American President; his beliefs are true in the actual and in nearby possible worlds. The mutation reliably tracks the President, partly because clairvoyance waves have recently filled our atmosphere (also by cosmic accident), and the President emits signals carried by those waves (again by cosmic accident).

Norman has no meta-beliefs about his possession of this process, nor does he have any meta-beliefs about the reliability of such processes.

Unlike many other belief-forming processes, this one entirely lacks any accompanying conscious sensations, conscious representations, or other "seeming-to-be-true" phenomenology. All the process does is stick true beliefs in Norman's head, without his awareness or acknowledgment. They don't even seem to come to him from out of the blue; he's got no clue that he's formed such a belief or why. It's as if they've been there all along.

These beliefs play no significant role in his life or overall mental economy. He receives no feedback of any sort or in any way that's he's right; these beliefs are otherwise entirely idle. He does nothing with the information; it serves no intellectual or practical end.

Even so, the belief is accessible, like stored beliefs in memory, just not its source or basis. So if you were to ask Norman where he believed the President was, he could tell you. If you then were to ask him why he believed it, he may confess he had no idea; we often forget the sources of our beliefs. "I don't remember." Or he might confabulate reasons that, in fact, have nothing to do with why he believes what he does: a common occurrence. "My uncle must have told me." (Nisbett & Wilson 1977)

In this example everything the run-of-the-mill reliabilist wants is present, but everything the experientialist wants is not. And, as anyone familiar with the literature knows, nearly everyone believes Norman's beliefs, despite reliably formed, are not justified, including leading reliabilists. The reliability of the process *may* take Norman's beliefs close to being *knowledge*. But the reliability does not *ipso facto justify* his beliefs. Reliabilists then face a big problem: *in situ*, matter of fact reliability does not seem sufficient for justified belief. Norman's beliefs, *if they are to be justified*, require inferential support from other justified beliefs. *De facto*, *in situ* reliability is not sufficient to *prima facie* justify his beliefs.

Lyons agrees. Norman's beliefs, though reliably formed, are "not *prima facie* justified, and thus the case is a counterexample" to simple reliabilism (Lyons 2009: 114, 118). The qualification "prima facie" matters, for as Lyons rightly observes, Norman's case is not simply one of *prima facie* justification defeated by other things he believes or should believe. Rather it's the complete lack of *prima facie* justification in the first place that's at issue. Your theory of defeaters won't solve the problem posed by clairvoyant powers cases (2009: 123-5).[2]

Lyons concludes that Bonjour's Norman poses a real problem for reliabilism, for it's incredibly easy to construct counterexamples by this recipe (2009: 122, 135). Pick your inferential belief, pick your mutation, and you're off to the races. Lyons believes that some beliefs require inferential justification and some do not. For those that do not, the reliability of the process is sufficient for *prima facie* justification. For

those that do, justified supporting beliefs must be called to muster; otherwise the belief is not justified, even if reliably formed. Reliabilists have been "unacceptably lax" in their "treatment" of inferential justification.

This led Lyons to propose and defend "Inferential Reliabilism" against "Simple Reliabilism." According to Simple Reliabilism reliability is sufficient for justifiedness:

If S's belief that p results from results from an *in situ* reliable cognitive process, **then** S's belief that P is *prima facie* justified.

According to Simple Reliabilism, Norman's beliefs about the President should be *prima facie* justified, when clearly they are not.

Lyons's alternative has a number of conditions. Here is the first, designed to exclude Norman, for Norman's belief does not satisfy the antecedent, for reliability alone is not sufficient for justifiedness.

(1) **If** S's belief that p is the result of the non-inferential operation of a primal system, and the operation of the process is reliable *in situ*, **then** the belief that p is *prima facie* justified.

To understand this, you need to know what a *primal system* is. Lyons will construct a theory of primal systems and basic beliefs (hence the title of his book,

Perception and Basic Beliefs) that entails Norman's belief is not the result of a primal system. Non-inferentially and reliably formed, the belief is nevertheless not "basic" for not formed on the basis of a primal system. Non-basic beliefs then make up the class of beliefs that need inferential justification if they are to be justified at all. Norman's beliefs lack inferential justification, and for that reason isn't justified, even if reliably formed. A correct theory of when a belief needs inferential justification then "solves" the clairvoyance problem for reliabilism. Hence the title of the theory: "Inferential Reliabilism."

II. PRIMAL SYSTEMS AND BASIC BELIEFS

What, then, is Lyons's theory of basic beliefs? Lyons first develops a theory of perceptual belief, where a perceptual belief is simply the output of a perceptual system, where a perceptual system is a cognitive system such that:

(a) Its lowest level inputs are transducers across sense organs.

(b) None of the inputs to any of its subsystems is under the voluntary control of the larger organism.

(c) It is "inferentially opaque" (i.e. its doxastic outputs are cognitively spontaneous; they are not the result of an introspective train of reasoning from earlier beliefs; the only introspectively accessible inter-level

representations produced by the system are nondoxastic; none of its inter-level representations are conscious beliefs). (2009: 95, 136)

(d) It has a "normal" etiology; i.e. it results from an interplay of learning and innate constraints.

Lyons then generalizes from perceptual systems to "primal" systems:

The theory…generalizes... I call a system that satisfies (c) and (d) above a "primal system", as the term is suggestive of both the ontogeny and the opacity of the system. Conditions (a) and (b) are distinctive of perceptual systems and are not required of all basic-belief-producing systems. (2011a: 445)

Conditions (c) and (d) are the defining features of "primal" cognitive systems. Condition (c) allows that sometimes the (opaque) inputs to a belief are other beliefs. When that happens, the operation of the (opaque) system is (partly) inferential. But when this does not occur, the system operates non-inferentially.

With primal systems in hand, Lyons then defines basic belief:

A belief B is basic for S at t iff B is the output of one of S's primal cognitive systems that (i) is inferentially opaque, (ii) has resulted from learning and innate constraints, and (iii) does not base B on any doxastic inputs at t. (2009: 144)

You might have thought (I know I did) that the distinction between basic and.

non-basic beliefs was entirely architectural: basic beliefs are not inferentially based

on other beliefs, non-basic beliefs are. But Lyons thinks you'd be wrong, or only half

right. Origins matter too: basic beliefs arise from "primal" cognitive systems,

systems that are either innate or learned or a bit of both. A non-inferential belief

caused by a system with the wrong origins—the wrong etiology—isn't a basic belief,

no matter the architecture of the system (2009: 126). So "basicality" for beliefs has

(at least) two dimensions: architecture (is the belief inferential or non-inferential?)

and origins (is the system innate or appropriately acquired?).

According to Inferential Reliabilism, Norman's clairvoyance beliefs are basic

prima facie justified *if* they meet four conditions: opacity, etiology, non-

inferentiality, and reliability. Norman's beliefs meet opacity, non-inferentiality and

reliability (for the system is opaque, it operates non-inferentially, and it is reliable),

but not etiology (origins), for the system is brand spanking new. Norman's

clairvoyance *beliefs* are thus not *basic* for the source is not *primal*. They thus fail to

be non-inferentially justified, even if non-inferentially and reliably formed.

Reliability alone is not sufficient for beliefs about the President, or four-

dimensionalism or the age of the earth, for those beliefs are *non-basic*. "For a

cognizer built like us, there are simply some propositions that can't be justified

without evidential support from other beliefs. These beliefs are non-basic for us"

(Lyons 2009: 122-4, 144). Simply causing them reliably is not sufficient for *prima*

facie justification. Lyons has spelled out a class of beliefs (the non-basic beliefs) as

requiring doxastic/inferential justification by spelling out the class of basic beliefs

justification. Basic beliefs do not require inferential support from other beliefs; non-

basic beliefs do.

Perceptual beliefs (for us) are basic (for our perceptual beliefs have the right

origins and so do not need inferential support from other justified beliefs);

clairvoyant beliefs (for us) are not (for they have the wrong origins and so would

need support from other justified beliefs; a reliable mutation would not be enough).

The clairvoyance problem is really about "basicality" and not about reliability.

"What looked to be objections to the claim that…reliability is sufficient for the

prima facie justification of some beliefs begin to look like objections to the claim

that some particular belief is basic" (Lyons 2009: 166). The problem with Norman is

that he is non-inferentially forming beliefs from non-primal systems that, for us,

must be formed inferentially to be justified. Counterexample diffused. Reliabilism is

no longer in danger of refutation from clairvoyance examples.

III. BASIC INFERENCE

Not just yet. Notice how Lyons's solution works: Inferential Reliabilism blocks the

recipe of creating justified *basic* beliefs on Simple Reliabilism by restricting what

counts as a *basic* belief. Since Norman's belief is not basic (the system is not a

primal system for it has the wrong origins), it's not a problem for Inferential

Reliabilism. Mutations needn't pose a problem, for mutations don't create primal

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systems. A "system that just came into being overnight would fail to satisfy the etiological constraint" (2009: 136-7). Hence they don't create basic beliefs, even if they create non-inferentially formed, reliably true beliefs.

But what if a belief is *inferentially* based on a justified belief (and so apparently has all the inferential support it needs) but results, in part, from a bizarre mutation? Won't that cause the same problem all over again? Instead of imagining our protagonist forming beliefs *non*-inferentially as the result of a mutation, imagine she forms them *inferentially* as the result of a mutation.

Here's a recipe for such cases.

SECOND RECIPE. First, imagine a justified basic belief (or a set of such beliefs). Second, imagine a belief that, if justified for us, is only justified inferentially (or a set of such beliefs). Third, imagine a mutation that produces a conditionally reliable process that takes the former basic justified belief (or set) as input and reliably produces the latter belief (or set) as output, such that the output is conditionally reliable on the input.

If mutations cause a problem for non-inferentially formed beliefs, they should cause the very same problem for inferentially formed beliefs.

Here's a concrete example.

NORMALA is a four year-old girl. She reliably forms perceptual beliefs about the shape of surfaces (as we all do). Imagine she forms the perceptual belief *that surface is round*. Then, according to Inferential Reliabilism, that belief is *prima facie* justified.

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Then imagine, due to a strange and bizarre mutation, this *prima facie* justified basic belief causes, without Normala's awareness or any accompanying phenomenology or experiential evidence, a reliably true belief about the whereabouts of the American President (or any hard-won item of science or philosophy, or any other belief that, for us at least, requires inferential support). In other words, imagine the mutation causes a reliable *inferential* cognitive system that takes justified beliefs as inputs and produces any belief you please—though reliably true—as output. The mutation, in this case, thus forms a reliable *inferential* belief from a *justified* basic belief.

You may resist calling this belief inferentially formed; *Lyons* would not. You may think Normala should "appreciate" the connection between the premise and the conclusion for it to be an inference; Lyons would not.

Normala has no meta-beliefs about her possession or use of this process, nor does she have any meta-beliefs about the reliability of such processes (cp. Lyons 2009: 138-9).

Unlike many other inferential belief-forming processes, this one entirely lacks any accompanying conscious sensations, conscious representations, or other "seeming-to-be-true" phenomenology. The process can be entirely unconscious (Lyons 2009: 139). All the process does is inferentially generate beliefs in Normala's head on the basis of non-inferentially justified basic beliefs, without her awareness or acknowledgment.

These beliefs play no significant role in her life or overall mental economy. She receives no feedback of any sort or in any way that she's right; these beliefs are otherwise entirely idle.

The resulting *inferentially* formed belief (for Lyons) seems no more justified than Norman's *non*-inferentially formed belief. Is this case a problem for Lyons? No it isn't, and it is important to see why.

To ward off Normala cases, Lyons requires *the right origins* for *inferentially* formed beliefs. Though Lyons didn't consider Normala type cases, he would insist that Normala's inferential transition is not a *basic* transition. Normala's belief, Lyons would say, does not result from a *basic inference*. A "basic inference is one that results from the inferential operation of a primal system (a non-basic inference is any other inference)" (Lyons 2009: 171). Since primal systems are innate or learned, but Normala's inferential process that transitions from justified premises (inputs) to reliably true conclusions (outputs) results from a random mutation, her inferential process is not a primal system. Her inference is then not a *basic inference*. Hence, for Lyons, though it is an inference, it is not a basic inference, and thus the resulting belief is not justified.

Lyons adds the following to Inferential Reliabilism.

(2) If S's belief that p is the result of the inferential operation of a primal system Σ, where (i) Σ bases the belief that p on the input beliefs that $q_1,\ldots q_n$, (ii) the process resulting in the belief is conditionally reliable, and (iii) S is *prima facie* justified in each of $q_1,\ldots q_n$, then the belief is *prima facie* justified. (2009: 177)

Since Normala's system isn't a primal system, it does not satisfy the antecedent of (2). Normala's inferential, reliably true belief is then not justified on Lyons's theory, for it is not based on a primal inferential system, just as Norman's non-inferential, reliably true belief is not justified either for it is not based on a primal non-inferential system. Pretty nifty.

IV. ARCHITECHTURE vs. ORIGINS

So far so good. Norman's belief is not basic (for the source has the wrong origins) and Normala's inference is not basic (for the source has the wrong origins). There's a lesson here to be learned. Lyons laments reliabilists unacceptable laxity about *inferential* justification. But the problem he's addressing, I believe, isn't really laxity about "architecture." It's really laxity about *origins*. What "mutation" and "benevolent manipulation" cases show is that origins matter. Clairvoyance cases are *bad* origins cases. It is not simply that reliabilists have been unduly lax about inferential versus non-inferential justification (even if they have), it's rather that they've been unduly lax about origins. The wrong origins can create an unconditionally reliable non-inferential mechaninism or a conditionally reliable inferential mechanism; either way it has the wrong origins.

We can make this point by constructing a clairvoyance counterexample that *doesn't* start with a belief that is intuitively only inferentially justified for us. That will show the problem is about origins, not architecture. Here's a third recipe.

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THIRD RECIPE. First, take a belief (or an analogue of such a belief) that would typically be *non*-inferentially justified for us. Second, reliably cause that belief (or the analogue) through a mutation, where the agent also does not in fact receive any other relevant feedback from other sources or through behavior that the belief is true; it's an "isolated" perceptual belief. Voila, another clairvoyance counterexample to Simple Reliabilism.

Usually we form perceptual beliefs on the basis of conscious visual perceptions. But Lyons believes consciousness is inessential for justification: blindsighters—even zombies without any conscious experiences—have basic justified beliefs too. (Hence the subtitle of his book.) So imagine a belief that's nearly a perceptual belief, that the agent doesn't act on or receive any feedback for, and then give it the wrong origins.

NORBERT is a four year-old boy. Norbert sometimes non-inferentially forms the belief *that surface is round*, formed without any accompanying conscious experience or awareness. He's partially blindsighted.

Imagine furthermore that, in this particular case, it is not caused by a reliable innate or learned perceptual belief-forming capacity, but instead is caused by a reliable cognitive system with hidden and unnoticeable sensory transducers that results from a strange and bizarre mutation.

Norbert enjoys no other collateral epistemic support for this belief. Norbert has no meta-beliefs about his possession of this process, nor does he have any meta-beliefs

about the reliability of such processes. All the process does is stick these beliefs in his head, without his awareness or acknowledgment. They don't even seem to come to him from out of the blue; he's got no clue that he's formed such a belief or why. It's as if they've been there all along.

Unlike typical perceptual beliefs, this belief plays no significant role in his life or overall mental economy. He receives no feedback of any sort or in any way that's he's right; the belief is otherwise entirely idle.

Though Norbert's belief has the same kind of content as a typical perceptual belief, it is not formed by a (strictly speaking) "primal" system (and so, for Lyons, not strictly speaking a perceptual belief). It is, however, non-inferentially and reliably formed.

Lyons would not call this belief justified, for it has the wrong etiology. Norbert is in the same boat as Norman and Normala. So take any belief that, typically, is non-inferentially justified for us (or an analogue), but then give it the wrong origins, and make sure not to give it any other epistemic support that Lyons has antecedently screened off as irrelevant. We have the same problem all over again. You don't have to start with a belief that is only inferentially justified for us to cause havoc for reliability theories of justification with bizarre mutations.[3]

It should be clear by now that the clairvoyance problem is fundamentally about *origins*, not about *architecture*. The issue isn't simply about the structure of the building; it's more importantly about why the building is there in the first place. Both Norman's and Norbert's beliefs were *non*-inferentially formed with the *wrong* origin and *not* justified, according to Lyons. Normala's belief was *inferentially*

formed with the *wrong* origin and also *not* justified, according to Lyons. Inferential or not, wrong origins excludes justification. But then the problem with reliability theories of justification is not simply that they've been unduly lax in their treatment of *inferential* justification. The deeper problem is that they've been unduly lax in their treatment of *origins*. A theory of justification that doesn't explicitly single out the right origins is in danger of refutation from such examples.

V. THE RELATIVITY OF ORIGINS

The preceding should be enough to establish my first thesis; the real issue isn't architecture but origins. More can be said to make this point stick. For Lyons allows psychological duplicates with the same architecture to differ in epistemic status because of different origins. It shall prove worthwhile to spell this out.

Recall Norman. Perception is primal for Norman, but clairvoyance is not. Norman enjoys perception innately. Norman's perceptual system goes through normal stages of development. Norman also learns new perceptual categories and expert perceptual categorization through learning. Norman's perceptual systems satisfy Lyons's etiological constraint on primal systems. Norman does not enjoy clairvoyance innately. Nor did he acquire it through normal stages of development from other innate systems. Nor did he develop clairvoyance through any learning mechanism. Norman acquired clairvoyance through some random mutation, perhaps

by stepping in radioactive waste. Clairvoyance just popped into his head one day, without his knowledge or acknowledgement.

According to Lyons, perceptual beliefs (for us) are basic, but "clairvoyant beliefs (for us) are not. Perceptual beliefs are the outputs of a [primal] system; clairvoyant beliefs are not" (2009: 121). Given the way we are built, some beliefs are basic and some are not. "For a cognizer built like us, there are simply some propositions that can't be justified without evidential support from other beliefs. These beliefs are non-basic for us" (2009: 122-4, 144).

However, the exact same clairvoyant system Norman acquires may be innate in some other possible individual or species of individuals. Lyons gives the following example of such an individual:

NYRMOON is a four year-old boy. He's a member of an alien but human-like species, living in a different environment in a different possible world. Nyrmoon's species have clairvoyance as a normal, reliable cognitive capacity, "which develops in much the same way as vision does for humans. Members of Nyrmoon's species have specialized organs that are receptive to the highly attenuated energy signals from distant events. (Lyons 2009: 119; Sosa 1980; Goldman 1988)

Clairvoyance is primal for Nyrmoon, just like perception for Norman. Nyrmoon enjoys clairvoyance innately. Nyrmoon's clairvoyance system goes through normal stages of development. Nyrmoon also learns new clairvoyant categories and expert

clairvoyant categorization through learning. Nyrmoon's clairvoyant systems satisfy Lyons's etiological constraint on primal systems.

Nyrmoon's entire species works this way. They all have it innately, and they all go through normal stages of development (Lyons 2009: 144, 164). It reliably tracks features of their environment, and they rely on this capacity to navigate and flourish in their natural habitats. Clairvoyance is "basic" for Nyrmoon and his species; clairvoyance produces basic beliefs *for them* (Sosa 1980, Goldman 1988).

Can Nyrmoon form justified "clairvoyance" beliefs? Lyons believes he can. I concur. If we have justified basic perceptual beliefs, then surely Nyrmoon has justified basic clairvoyance beliefs. This non-actual, reliable belief-forming process is just as good as ordinary human perception. Like human perception, it has the right origins. Clairvoyance is "basic" for Nyrmoon's species but not for ours. Clairvoyance satisfies the etiological constraint *for them* but not *for us*. Clairvoyance produces basic beliefs *for them* but not *for us*.

We can even imagine that Norman and Nyrmoon are molecule-for-molecule duplicates. The point is the same: Nyrmoon's beliefs are justified; Norman's are not. Nyrmoon's species, like ours, relies on vision for what they can see. Unlike us, they also use clairvoyance for what they can't. Clairvoyance for them has the *right* origins; clairvoyance for us has the *wrong* origins. Same "architecture" different origins. What really matters to the reliabilist program is getting the origins just right. The preceding sections should be more than enough to establish my first thesis: it's not laxity about architecture that matters, but laxity about origins. What a reliability

theory needs to rule out strange origin cases is a good theory of good origins, not simply more attention to the contrast between inferential and non-inferential architecture.

VI. WHY ORIGINS MIGHT MATTER

But if origins are what really matters, why do they matter? What explains why a belief (either non-inferential or inferential) must be based on a *primal* system? I now turn to my second thesis. I will argue that, unfortunately, Lyons never really explains why the origins he selects matter to turning reliably formed but unjustified beliefs into reliably formed justified beliefs; Lyons doesn't say why innate or learned reliable non-inferential systems or why innate or learned inferential systems are the right kind of systems. His argument for origins is entirely case-based: if mutations make for bad origins, then non-mutations must make for good origins. That's all we get from Lyons. But if innateness and learning matters, are there reasons for thinking they do?

Here is a fundamental feature of many innate systems that he might have found relevant for thinking that innateness matters for justified beliefs.

Many traits are *adaptive* in the sense that they are useful to the organism. One clear way to be biologically useful is to contribute to relative fitness; you are more likely to survive and reproduce. When an organism has an adaptive trait, the organism can either have it *because* it is adaptive or for some other reason. When an

organism has a trait *because* it is adaptive, the trait is an *adaptation*. Organisms have many of their adaptive traits because they are adaptive; many adaptive traits are adaptations. An *adaptive explanation* explains why a trait exists *because* it is adaptive.[4]

Evolution by natural selection is the only non-magical explanation of the existence of innate, functionally complex adaptive traits, especially those that have evolved through convergent evolution (Dawkins 1986). I confidently assert that every innate complex cognitive system we've got that's reliable and clearly confers justification—especially perception—resulted from evolution by natural selection. Bracketing magical thinking, Nyrmoon's clairvoyance (like Norman's perception) would have resulted from natural selection too. Natural (directional and maintenance) selection is the best explanation for the origin and persistence of functionally complex adaptive traits in a population, especially those that arise across the animal kingdom through convergent evolution.

Natural selection works by taking variants of traits and selecting among the variants because of their consequences. The variants with the best relative consequences are preserved. Natural selection is then a feedback mechanism; it takes relative consequences of ancestor traits as input and produces the descendent traits with those same consequences as output. Perception, memory, and reasoning are all adaptations (they're certainly not spandrels; that would be absurd). They have all resulted from evolution by natural selection. Perception reliably induces true beliefs, and by doing so it contributes to relative fitness, and by doing so it contributes to its

persistence in the human population. Innate reliable psychological processes are then acquired, in part, because they conduce good consequences by being reliable, where those good consequences enter into a feedback loop that explain why the processes are selected and retained.[5]

Perception is not merely "truth" adaptive in the sense that it reliably causes and sustains true beliefs. Perception is an *adaptation*. Perception exists, in part, *because* perception is useful. Perceptual systems exist, and we have them, partly because they confer benefits on us, partly by reliably causing and sustaining true beliefs. Getting things reliably right then partly *explains why* we have these processes; feedback matters.

Biological adaptations exist, in part, because they are adaptive; they are a good fit between an organism and its environment. Adaptations are those aspects of the morphology, physiology, and behavior of organisms that are adaptive solutions to problems posed by the environment, adaptive solutions that arise and persist because of an explanatory history of evolution by natural selection, that arise and persist partly because of a good fit.[6]

So Lyons may think innateness matters because those reliable processes that are innate in us are there because they have entered feedback loops that contribute to their continued existence. Lyons may think innateness matters because innate cognitive processes are not merely truth-adaptive but genuine adaptations. They are not just good fits between mind and world, but they arise and persist *because* they are good fits.

Here is a fundamental feature of many learned traits and behaviors that he might have found relevant for thinking that learning matters for justified beliefs.

Psychologists and ethologists see learning, like evolution by natural selection, as a process that produces adaptations to the environment: useful traits that persist because they are useful. Learning is a feedback mechanism that takes input from the environment and produces adaptive solutions as output; learning is the adaptive modification of behavior based on experience (Lorenz 1966, Alcock 2009: 97-98). Trial-and-error learning (either conscious or unconscious) is the paradigm for learning new skills or acquiring new "systems." [7] It is a trite observation in psychology textbooks that trial-and-error learning, even if very fast, resembles evolution by natural selection. For it involves variants in behavior, consequences of that behavior, and then modification of future behavior (and so selection among variants) on the basis of the consequences of that behavior. So if you are learning or acquiring a new belief-forming process, you'll first make mistakes, and then get feedback on the basis of which you'll modify your behavior or belief-forming processes until you settle on the one you have thereby "learned" to use. Learned reliable processes are then learned, in part, because they conduce good consequences by being reliable, where those good consequences enter into a feedback loop that explain why the processes are modified and then retained. Learning produces a good (an adaptive) fit. Learning mechanisms adapt the organism to its environment. Learning mechanisms produce adaptations, good fits that exist partly because they are good fits.

Learning mechanisms are themselves innate adaptations, innate mechanisms for further adapting the organism to its environment. "If learning is an adaptive improvement, there has to be, in Lorenz's phrase, an innate teaching mechanism, or "innate schoolmarm.""(Dawkins 2010: 361). Nature encodes learning mechanisms when the environment is sufficiently unpredictable to simply encode solutions to environmental problems. If an organism needs to adapt to its changing environment in its lifetime, nature builds in learning mechanisms.[8]

So Lyons may think innateness and learning matters because those reliable processes (either innate or learned) are there because they have entered feedback loops that contribute to their continued existence; we have these capacities because they are reliable, and that's what (at least in part) explains why *these* (innate or learned) as opposed to *those* (mutations or surgical interventions) origins matter. The reliable processes that confer justification exist partly because they reliably produce true beliefs; reliable processes that do not confer justification do not exist or persist (partly) *because* they are reliable. Being reliable explains why they exist; being reliable is then *ipso facto* a non-accidental, explanatory property of the system. Inferential and non-inferential cognitive systems confer justification when they are adaptations *for* reliably causing and sustaining true beliefs, for then the reliability of the system is a non-accidental feature of the system. Good fits are not just adaptive fits; good fits are adaptations. These systems are non-accidentally reliable.

Norman's clairvoyance is just an accident, even if a good fit. He doesn't have it because it is adaptive; its reliability does not explain why he has it. Nyrmoon's

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clairvoyance, on the other hand, isn't just an accident. He has it (partly) because it is adaptive; its reliability does explain why he has it. Norman's reliability is an *accidental*, *non*-explanatory fact. Nyrmoon's reliability is a *non*-accidental, *explanatory* fact. Nyrmoon's process is an adaptation; Norman's is not. Norman's clairvoyance case shows accidental reliability is not sufficient for justification. Maybe that's why origins matter. Or maybe that is at least a step along the way to explaining why origins matter.

VII. HOPEFUL MONSTERS

But this is not at all why Lyons thinks. For Lyons doesn't think innateness or learning matters *because* innate are learned traits are mostly adaptations (and so explained by their beneficial effects through feedback mechanisms). Rather he thinks innateness matters because….

Actually, he doesn't say. He gives us no hints at all. He gives us no direction for constructing an explanation for why innateness, for example, might really matter. In fact, it seems, any "innateness" will do, even "innate" traits *without an explanation*. Consider the following apparent counterexample to Lyons's view.

NORCO is a four year-old boy who has a clairvoyant powers mutation written into his genes. Maybe the mutation occurred during conception, or early in the pregnancy. Or maybe it occurred late in the pregnancy, or just before (even seconds before) birth.

Imagine too that the mutation lies dormant for years only comes to fruition later in life, at exactly the same time as Norman's mutation, affecting Norco exactly the same was as Norman. We can even image that when the mutation comes to life Norman and Norco are molecule-for-molecule duplicates.

Norco's innate mutation then reliably induces true beliefs about the whereabouts of the American President, exactly like Norman's non-innate mutation. Like Norman's, it entirely lacks any accompanying conscious sensations, conscious representations, or other "seeming-to-be-true" phenomenology. They don't even seem to come to him from out of the blue; he's got no clue that he's formed such a belief or why. These beliefs play no role in his life or overall mental economy. He receives no feedback, of any sort or in any way, that's he's right; these beliefs are otherwise entirely idle.

No selection of learning of any kind explains why Norco has this process. It is reliable, but its being reliable is explanatorily irrelevant to its existence or persistence. Its reliability does not explain, in any way, why he has this process.

Now it seems to me—I'm speaking from the heart now—that if Norman is in trouble, then so is Norco. If the wrong origin—a lucky mutation—rules out Norman's reliably true beliefs as justified, then the wrong origin—a lucky mutation—rules out Norco's beliefs as justified. We have even imagined they become duplicates. Norco's clairvoyance is written into his genes before birth but only emerges later. Norman's identical clairvoyance only gets into his genes later in life. What's the difference?

If being reliable doesn't enter into a feedback loop that explains why the individual has the system, then the possession of the system isn't explained by the system's being reliable, and then the reliability is a non-explanatory, accidental feature of the system. If Norman doesn't have what it takes for justified beliefs about the location of the leader of the free world, then neither does his doppelganger Norco. If the reliabilist is worried about mutations, "accidental" causes of psychological systems—even if they reliably induce true beliefs—then *when* they occur should not matter.

Norco strikes me as a clear counterexample to Lyons's account of justified basic beliefs. On Lyons's theory, Norman's beliefs are not basic for not the result of a primal system, for Norman's process isn't innate. On the other hand, Norco's beliefs are basic on Lyons's theory, for Norco's process is innate. So on Lyons's theory, Norman and Norco do not stand or fall together, for Norman was mutated after birth, and Norco was mutated before. *Innate* origins are not the same as the *right* origins.

Norco's mutation is what a biologist might call a "hopeful monster." In nature, new traits often arise very slowly through a series of cumulative micro-mutations. But once in a while a macro-mutation arises, where a new trait emerges in a single step. In almost every case these macro-mutations are harmful; think of extreme birth defects. But in principle, and sometimes in practice, these macro-mutations are beneficial to the organism, hence the name "hopeful monster." Norco's mutation is then "truth-adaptive" in the sense that it reliably induces true beliefs,

even though, *per hypothesis*, Norco doesn't benefit in any other way from the mutation (he receives no feedback and the beliefs are otherwise idle), and so his "truth-adaptive" mutation isn't, in any sense, an adaptation.

When confronted with a case like this on another occasion, Lyons confesses that he has the "wrong" intuition: "the mere fact" that an individual like Norco is "the first of his line" (and, for all that, he may be the last), "doesn't affect my intuition that he's justified, so long as we conceive his clairvoyance module to be a primal system in my sense" (Lyons 2011b: 486).

Lyons thus doesn't think it matters *why* the process is innate. All that matters, for Lyons, is that it the system *is* innate, a part of the individual's "basic" package. Any kind of innateness, it seems, will do the trick. It is perfectly OK with Lyons if the process is accidentally reliable, a cosmic accident, provided only that it is "written in to the genes" *before* birth.

VIII. ORIGINS EMASCULATED

Lyons not only thinks Norco fits the bill, but he also "has the intuition that Swampman [a molecule-for-molecule duplicate of you or me, created by random accident when a bolt of lightning hits a log in a swamp] has justified beliefs, even though he has no phylogenetic history" (Lyons 2011b: 486). And Swampman at creation doesn't have any ontogenetic history either; he's yet to learn a single thing. He certainly hasn't modified any of his innate systems through development. He has

no phylogentic *or* ontogenetic history, for he has no history at all. No consequences—no feedback—explain anything about him at all. He's a cosmic accident, a mystery of mysteries.

Even so, Lyons thinks Swampman's capacities are "innate." To "say that a trait is innate is—very roughly—to say that its presence in an entity was more or less determined by the initial state of that entity…The Swampman's initial state is the state he is in when he comes into existence. What systems he has at that time, he has innately, so the Swampman is guaranteed to have systems that satisfy the etiological constraint if he has any systems at all" (Lyons 2009: 147). Swampman meets the etiological constraint, Lyons claims, and so he has justified beliefs on Lyons's theory.

Swampman? Really?

Lyons argued for an etiological constraint, but then when the chips are down the only etiology he cares about is the *initial state* of the organism, never mind the *explanation* for the initial state. Lyons called in Swampman to sheer off phylogenetic history as irrelevant to justification. Instead he says he only favors a "narrow" etiological constraint that "is only concerned with the ontogenetic history of the organism" (Lyons 2011b: 486).

But Swampman is more corrosive than that, for Swampman sheers off learning history as well. For Swampman, like Norman's clairvoyant power, just popped into existence. Learning isn't essential, for Swampman hasn't had a chance to learn anything or to develop in anyway; he's fully formed, up and running.

Evolution by natural selection doesn't matter, for Swampman has no history, one in a zillion, possibly sterile and so the first and last of his kind. Learning plays no role, for he hasn't learned a single thing, and a bolt of lightning might kill him off any day.[9] Feedback then plays absolutely no role whatsoever, as far as I can tell, in Lyons's theory. But if feedback plays absolutely no role whatsoever, then why care so much about origins, especially when two origins we know a good deal about— evolution and learning—are feedback mechanisms on beneficial effects?

Swampman might as well be a molecule for molecule duplicate of Norman. Suddenly Swampman has justified clairvoyance beliefs but Norman doesn't? Suddenly Swampman has justified beliefs because he has *no* history (so *ipso facto* everything about him is innate) but Norman *lacks* justified clairvoyance beliefs because he does have a history?

Human perception exists because of feedback. We've got eyes because having eyes made a huge difference in our evolution. We develop new perceptual categories through perceptual learning because of feedback. We learn new categories through perception because making finer discriminations helps us achieve our ends. It's not just that human perception reliably induces true beliefs; we act on those beliefs and receive feedback on their utility, feedback that in turn explains why we continue to possess, use, and modify those capacities. And what is true of us is surely true of Nyrmoon and his conspecifics. They have clairvoyance because it helps them. They've got clairvoyant powers because of feedback.

I object to the way Lyons emasculates origins to accommodate Swampman.
If you are going to reject certain obviously important features of perception in
humans and clairvoyance in alien species as irrelevant, then you can't build a theory
around cases that involve those features without first screening those features out.
After all, part of what makes Norman's case of "bad" clairvoyance so compelling is
that he's received no feedback whatsoever, whereas Nyrmoon has. You can't
surreptitiously rely on well-established and explanatorily salient features of
perception and "good" clairvoyance and then dismiss them as irrelevant when
Swampman knocks on your door.

In principle the *intuition* that Swampman has justified beliefs is not so hard to
"accommodate." Since we've stipulated that Swampman is a molecule for molecule
duplicate of an ordinary human being, and we all know ordinary human beings have
justified beliefs, then it will certainly *seem*, *prior to reflection*, that Swampman has
justified beliefs, for Swampman certainly *seems* an awful lot like us. Like fools gold
(that looks just like gold to the untrained eye) or twin water (that requires a little
chemistry to distinguish from real water), it is easy for Swampman to seem just like
you and me without a thorough philosophical examination. But just as we can give
up the claim that fools good and twin water are real gold and real water upon further
reflection, we can give up the claim that Swampman has justified beliefs, especially
at conception, upon further reflection. We may find it "intuitive" that he has justified
beliefs, knowing full well that he doesn't, for he lacks the right etiology. With a good

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theory of the right origins, you can explain why, though Swampman *seems* to be just like us, in reality he is not. He's got the *wrong origins*.[10]

Lyons takes us on a long ride that emphasizes inference and architecture, but the real issues surround origins. But when the chips are down, he says *nothing* about why origins matter. That's my real beef. An adequate theory needs to say why *these* as opposed to *those* origins make the difference between reliably true justified beliefs and reliably true unjustified beliefs. Why do *these* origins and not *those* produce justified beliefs? Why does being written in to the "initial state" of the organism make all the difference? He doesn't say.[11]

References

Audi, Robert (1988). *Belief, Justification, and Knowledge* (Wadsworth).

Bach, Kent (1985). 'A Rationale for Reliabilism' *The Monist*.

Bonjour, Laurence (1980). 'Externalist Theories of Knowledge' *Midwest Studies in Philosophy*.

Buss, David and T. Shackelford, A. Bleske, J. Wakefield (1998). 'Adaptations, Exaptations, and Spandrels' *American Psychologist* 55: 533-548.

Cohen, Stewart (1983). 'Justification and Truth' Philosophical Studies.

Cummins, Robert (1975). 'Functional Analysis' *Journal of Philosophy*.

Dawkins, Richard (2010). 'Universal Darwinism' in Bedau, ed., *What is Life?* (Cambridge).

Foley, Richard (1985). 'What's Wrong with Reliabilism?' *The Monist*.

Goldman, Alvin (1979). 'What is Justified Belief?' reprinted in his *Liasons* (MIT Press, 1992).

Goldman, Alvin (1986). *Epistemology and Cognition* (Harvard).

Goldman, Alvin (1992). 'Epistemic Folkways and Scientific Epistemology' in his *Liasons* (MIT Press).

Goldman, Alvin (1999). 'A Priori Warrant and Naturalistic Epistemology' reprinted in his *Pathways to Knowledge* (Oxford, 2002).

Graham, Peter J. (2011a). 'Psychological Capacity and Positive Epistemic Status' in *The New Intuitionism* (Continuum).

Graham, Peter J. (2011b). 'Perceptual Entitlement and Basic Beliefs' *Philosophical Studies*.

Graham, Peter J. (2012). 'Epistemic Entitlement' *Nous*.

Graham, Peter J. (2014a). 'The Function of Perception' in A. Fairweather, *Virtue Epistemology Naturalized* (Synthese Library).

Graham, Peter J. (2014b). 'Warrant, Functions, History' in O. Flanagan & A. Fairweather, *Naturalizing Epistemic Virtue* (Cambridge).

Graham, Peter J. (forthcoming). 'Against Actual-World Reliabilism' in Miguel-Angel Fernandez, *Performance Epistemology* (Oxford).

Graham, Peter J. (in preparation). 'Proper Functionalism and the Proper Theory of Functions' University of California, Riverside.

Lehrer, Keith (1990). *Theory of Knowledge* (Wadsworth).

Lorenz, Konrad (1966). *Evolution and Modification of Behavior* (University of Chicago Press).

Lyons, Jack (2009). *Perception and Basic Beliefs: Modules, Zombies, and the Problem of the External World* (Oxford).

Lyons, Jack (2011a). '*Precis* of Perception and Basic Beliefs' *Philosophical Studies*.

Lyons, Jack (2011b). 'Response to Critics' *Philosophical Studies*.

Lyons, Jack (2012). 'Should Reliabilists Care About Demon-Worlds?' *Philosophy and Phenomenological Research*.

Nanay, Bence (2005). 'Can Cumulative Selection Explain Adaptation?' *Philosophy of Science*.

Nisbett & Timothy Wilson (1977). 'Telling More Than We Can Know'

Psychological Review 84: 231-59.

Sober, Elliot (1984). *The Nature of Selection* (Cambridge: The MIT Press).

Sosa, Ernest (1980). 'The Raft and the Pyramid' Midwest Studies in Philosophy V.

Sterelny, Kim and Paul Griffiths (1999). *Sex and Death: An Introduction to the*

Philosophy of Biology (Chicago).

[1] I discuss these contrasts in more detail in my 2011a and forthcoming-a.

[2] I realize the case is not always understood as a problem "internal" to reliabilism. In part that is because experientialists tend to add that Norman's belief comes to him "out of the blue" like a sudden attack of heartburn or some strange premonition, where it would be natural for Norman to feel uncertain and to wonder why he believes as he does. Experientialists tend to emphasize that from Norman's conscious perspective, it seems entirely accidental to him that he believes the President is in New York. This description, however, tends to assimilate Norman's case to Bonjour's other cases where the subject's belief is defeated by other things the subject believes or should believe, given other elements within his or her perspective. Reliabilists then tend to be unmoved by the case, as they feel satisfied with their account of defeaters. So in order to make clear that we are focusing on reliabilism as theory of *prima facie* justification, I have explicitly eliminated any such feeling from Norman's perspective that something is not quite right.

[3] Lyons thinks Bonjour and Lehrer stacked the deck in their famous examples by starting with beliefs that are clearly only inferentially justified for us (no wonder Bonjour and Lehrer think those beliefs require inferential support from meta-beliefs). Lyons then challenges Bonjour and Lehrer to concoct a case that challenges reliabilism without beliefs that are clearly non-inferentially justified for us. Now of course Bonjour and Lehrer won't take up that challenge, for they deny the very

existence of non-inferentially justified (empirical) beliefs. But since we're not so committed, we can concoct such a case. Norbert should do the trick.

[4] There is a tendency among philosophers skeptical of evolution and evolutionary explanations to cry "Gould!" in the hopes of screening off evolutionary explanations, even in "naturalized" epistemology (e.g. Lyons 2009: 128). Gould spent a good deal of his career arguing against strong adaptationism in biology, the doctrine that all traits—especially obviously adaptive traits—arose due to natural selection for their currently adaptive effect. Gould argued instead that many adaptive traits are "exaptations" and that many other traits are not adaptive at all. He called some of these latter traits "spandrels." Gould's influence here was salutary; adaptationists sometimes go too far. But it should not distract from the well-entrenched fact that many traits are adaptations—especially the functionally complex and those that arise through convergent evolution—where eyes through the animal kingdom are a paradigm case. (Gould, for one, would never, ever deny that eyes are adaptations. Gould is not an anti-evolutionary lunatic.) Furthermore, exaptations are often just as much adaptations as adaptations; they are simply traits that originally arose for some other adaptive purpose that were later modified and adapted to some other, or some additional, purpose. For discussion and references, see Sterelny and Griffiths 1997 and David Buss, et. al., 1998.

[5] Natural selection certainly explains the change in frequency—and so the persistence—of a trait in a population. Without natural selection there wouldn't be

visual systems across the animal kingdom. Does it also explain, at least in part, why an *individual* organism has a *token* of that trait? Cummins (1975) and Sober (1984) have argued it does not. Nanay (2005) convincingly responds.

[6] I discuss objections to the claim that evolution would select for reliably true psychological processes in my 2014a. Is Lehrer's tempucomp in Truetemp's head an adaptation? No. Though the device has an assigned function from the designer, and though it may reliably fulfill its function, it has not entered into a feedback mechanism that explains why it persists in terms of its benefits to Truetemp. In fact the case is described so that it doesn't. Intentionally assigned function is one thing, adaptation is another. Cp. Lyons 2009: 128. I discuss the Truetemp case in more detail in my 'Proper Functionalism and the Proper Theory of Functions.'

[7] "Perceptual systems develop through the interaction of genetics and environmental factors, a combination of learning and innateness. Experience fine-tunes discriminatory abilities…Learning can also result in [whole new systems]" (Lyons 2009: 92, 95).

[8] I discuss learning, natural selection and feedback mechanisms at greater length in my 2014b and my in preparation.

[9] True, Swampman might interact with his environment and receive feedback from his environment that explains why he continues to use his seemingly psychological capacities. But Lyons has screened that off. Swampman at the second of creation, before any feedback, has reliable powers with, according to Lyons, the right origins.