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# Anti-naturalism and proper function

TYLER WUNDER

*Department of Philosophy, Wilfrid Laurier University, 75 University Avenue West, Waterloo, Ontario, N2L 3C5, Canada*

**Abstract:** **The penultimate chapter of Alvin Plantinga's *Warrant and Proper Function* attacks metaphysical naturalism through an argument which concludes that only a supernaturalistic worldview can accommodate the indispensable concept of proper function. I make the case that this argument, which I dub 'the argument from proper function', suffers from two major flaws. First, it underestimates the naturalist's ability to ground natural proper function ascriptions in the concept of health. Second, it relies upon an overly stringent standard for successful conceptual analysis; ironically, the naturalist can undercut the argument by adopting Plantinga's own recommended model for analysing concepts.**

In the final two chapters of *Warrant and Proper Function* (hereafter abbreviated as *WPF*),[1] Alvin Plantinga introduces two arguments against metaphysical naturalism – essentially, the denial of all things supernatural – which loosely qualify as natural theology: although not explicitly presented as arguments for God's existence, they aim to undermine the epistemic status of not believing in a divine intelligence. The latter argument, referred to as both 'Darwin's doubt' and the 'evolutionary argument against naturalism', has received a great deal of critical attention from philosophers both within and without the philosophy of religion.[2]

The former argument, on the other hand, has received a good deal less attention and is not given an official name; for reasons which will shortly become clear, I shall refer to it as 'the argument from proper function'. This argument aims to sketch out the beginnings of an anti-naturalistic research programme through something like the following premises: (1) either there is a satisfying naturalistic accounting of biological and psychological/cognitive proper function (i.e. organic proper function), or proper function in those contexts requires a rational, supernatural designer; (2) there is not, and cannot be, a satisfying naturalistic accounting of biological and psychological/cognitive proper function. (1) and (2) provide a straightforward disjunctive syllogism to the obvious



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conclusion: proper function in the organic/cognitive realm necessitates a supernatural designer.

It is unfortunate that, compared with Darwin's doubt, the argument from proper function has gone relatively unnoticed in the literature; for it is the latter anti-naturalistic argument of Plantinga's which is most closely associated with his overall epistemological system.[3] In an attempt to draw further attention to this relatively under-examined piece of Plantingan reasoning, this paper will take issue with each of the argument from proper function's premises by arguing the following: premise (1) is inadequately defended and underestimates the naturalist's ability to ground organic proper function ascriptions in the non-teleological concept of health; premise (2) unfairly burdens the naturalist with an excessively stringent standard of successful conceptual analysis, and overlooks the possibility of the naturalist adopting Plantinga's own preferred approach to conceptual analysis when trying to account for proper function. I conclude that if the naturalist can use Plantinga's own approach to conceptual analysis, the argument from proper function is completely undercut.

## The prima facie designer inference

According to Plantinga, the term 'proper function' is interdefinable with the following terms (among others): 'dysfunction'; 'design'; 'function'; 'normality' (non-statistical); 'damage'; and 'purpose' (*WPF*, 4). For simplicity's sake I will focus mainly on proper function when presenting Plantinga's views, but it should be remembered that a major assumption behind the argument from proper function is that proper function cannot be divorced from this larger family of concepts.

The case for premise (1) starts with the observation that the paradigm cases of proper function (*et al.*) are cases involving human artifacts. Statements such as 'my carburettor is functioning properly', or 'my computer is malfunctioning' describe paradigm cases of proper function; on the other hand, statements like 'that bird's wing is functioning properly' or 'our patient's liver is not functioning properly' describe non-paradigmatic cases of proper function. Plantinga sees this as a philosophical problem facing anyone ascribing proper function to the non-artifactual realm (i.e. the natural organic world). Call this 'the problem of artifactual paradigms' (PAP for short).

How serious of a problem is PAP? Plantinga thinks it is quite serious: if your worldview cannot account for organic uses of proper function, then your applications of that term to the natural world will be incoherent, incorrect, and improper. Christian theism allegedly has no difficulty so accounting: proper functions in the organic realm relate analogously to the paradigm cases of artifactual function via the intentions of a divine designer; if we assume our cognitive

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faculties are artifacts of God's intentional design, there is no problem in attributing proper function to our cognitive faculties.

But Plantinga has a hard time seeing how the naturalist, unable to resort to this solution, can defend his use of proper function in the natural world:

> What is it, after all, for a natural organism – a tree, for example, or a horse – to be in good working order, to be functioning properly, to be functioning the way it ought to, to be functioning in accord with its design plan? Isn't a trout decomposing in a hill of corn functioning just as properly, so far as nature herself goes, as one happily swimming around chasing minnows? (*WPF*, 195)

Of course, this problem may be news to many naturalists who, as Plantinga well realizes, apply the concept of proper function to the organic realm all the time.[4] Nevertheless, he agrees with a group of unnamed naturalists who see PAP as a serious problem:

> They do not deny that atheists *use* this notion; what they deny is that they *correctly* use it. They mean to question whether the notions of proper function, purpose, damage, design plan, and the like can be coherently understood and endorsed from a naturalistic perspective. If, as a matter of fact, natural organisms have *not* been designed, what sense can we make of the notions of design plan and proper function as applied to them? The question is whether the claim that our faculties can function properly or improperly (the claim that our faculties have a design plan) – the question is whether this claim entails that we really *have* been designed by some personal rational being such as God. (*WPF*, 198)

Thus, PAP presents a real threat of incoherence and incorrectness for the naturalist using these terms in these ways; the problem is motivated by the claim that paradigmatic uses of proper function do not involve the organic realm, but rather refer to the human artifactual realm. The theist can resolve PAP by extending the borders of coherent proper function ascription, via analogy, into the organic realm; unless the naturalist can do something similar, adopting theism may be the only way coherently to ascribe proper function to the organic world.

There are a number of points at which the naturalist can take serious issue with premise (1). I will raise two. The first takes issue with PAP's most basic claim (viz. that the paradigm cases of proper function are all artifactual); the second allows that PAP may be a genuine problem, but shows how the naturalist can escape it without appealing to divine intentions.

## Is PAP a genuine problem?

When introducing the argument from proper function, Plantinga adopts the rhetorical strategy of considering PAP as a problem for his own proper functionalism theory of warrant.[5] When in this apparently defensive mode he concedes 'that the notions of purpose, design plan, proper function, damage, and their colleagues are most at home in thought about artifacts, machines, and other

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devices that have been designed and constructed by such conscious purposeful agents as human beings' (*WPF*, 195). The next page concludes that our 'paradigm cases of design and proper function, therefore, are artifacts, things designed by conscious agents. This is the ancestral home of these notions; this is where they apply most naturally and easily' (*WPF*, 196).

What is the nature of the paradigm cases of which Plantinga speaks? He does not say within the text of the chapter containing the argument from proper function, but elsewhere in *WPF* the paradigm cases are identified as those cases which are 'clear and unambiguous cases' of a given concept (*WPF*, ix). But if that is so, why think the clear and unambiguous cases of proper function are exclusively artifactual in nature? Is it really true that all clear and unambiguous cases of proper function happen to fall within the artifactual realm? One may be inclined to disagree, particularly in light of Plantinga's observation that we all have similar intuitions about proper function ascriptions in the natural world:

> We think a hawk's heart that beats only twenty-five times a minute is not functioning properly, that AIDS damages the immune system and makes it function poorly, that multiple sclerosis causes the immune system to malfunction in such a way that white blood cells attack the nervous system, and that the purpose or function of the heart is to pump blood, not to make that thumpa-thumpa sound. (*WPF*, 196)

> Can't anyone, theist or not, see … [t]hat an arthritic hand does not function properly, or that a damaged rotator cuff doesn't work as it ought? (*WPF*, 198)

Plantinga grants that atheists commonly say such things, but denies that they do so either correctly or coherently. But if the paradigm cases are the touchstone of propriety for proper-function ascriptions, and the criteria of the paradigm cases are clarity and lack of ambiguity, why are not at least some of these biological proper functions included within the paradigm cases? What is so unclear and ambiguous about the atheist's claim that his shoulder is injured – improperly functioning – particularly when anyone can see that this is so?

Plantinga denies that the compelling character of this sort of thought establishes its coherence; the easy consensus of 'Cannot anyone … see?' does not establish such cases as paradigmatic. But if that is true, by what criteria are artifactual cases of proper function deemed to be the paradigm cases? Certainly it cannot be because anyone can see that it is the proper function of an artifact to do such-and-such; for that claim is clearly false, and even if it were true it would be a criterion also true for cases of organic proper function.

Perhaps the idea is that applying proper function to the organic world is philosophically puzzling, while proper function regarding artifacts is not. But this, too, is dubious: even if it is the habit of some philosophers to suggest organic proper function is more puzzling, or just more interesting, than artifactual proper function, it does not follow that artifactual proper function is philosophically unproblematic. What is not a source of philosophical puzzlement? Plantinga

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himself draws attention to some of the philosophical problems surrounding the artifactual notion of proper function:

> … must there be, for any given device, some one person whose intentions determine what proper function is for that device? Presumably not: some artifacts are the results of the work of committees; and others – Indian arrowheads and canoes, for example – are such that their design plans grow or evolve over time, with each of many different people offering a bit of streamlining here or small improvement there. Further, perhaps I could trick you into designing a thing such that *you* didn't at all intend it to do what it does when it functions properly. (*WPF*, 195–196)[6]

Nonetheless, Plantinga insists there is 'no denying that intention and conscious design crucially enter into what it is that determines the function(s) of an artifact and whether a given way of functioning is or is not proper functioning' (*WPF*, 196). Perhaps so, but that would not imply the artifactual realm is the exclusive domain of those clear and unambiguous attributions of proper function which get to be called 'the paradigm cases'. In short, the claim that only artifact cases qualify as paradigm cases of proper function (and a small family of interdefinable terms) is inadequately defended; since the claim is essential to Plantinga's conclusion, some additional argument is required to bolster premise (1).

## Health and proper function

For the sake of argument, assume that all paradigmatic proper functions are artifactual in nature: there are no clear and unambiguous organic applications of proper function. How unclear and ambiguous are organic proper functions? For the theist, not so unclear that the analogy between divine design and human design cannot ensure coherence, but Plantinga thinks things are different for the naturalist who has no such recourse.

Contrarily, I suggest the naturalist in this scenario could exploit a different family of concepts, a resource that could help justify his non-paradigmatic ascriptions of proper function to the organic world: he can appeal to a family of concepts dominated by 'health', and including others like 'disease', 'injury', 'pain', and perhaps even 'life' and 'death'. Grant for the sake of argument that, as a naturalist, I cannot say, clearly and unambiguously, that my heart functions properly when it pumps blood in such-and-such a way. Nevertheless, can I not clearly and unambiguously say that healthy hearts pump blood, and then analogically relate my organic proper function ascriptions to these paradigm cases of health? If Plantinga can relate his analogical proper function ascriptions to paradigmatic proper function *et al.*, why cannot the naturalist relate his analogical proper function ascriptions to paradigmatic health *et al.*?

Plantinga suggests a response: while insisting that we do, naturally and unavoidably, apply proper function *et al.* to the natural world, he says 'The notions

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of proper function, disease, and damage apply here and in a thousand other contexts' (*WPF*, 196). Similarly, 'Can't anyone, theist or not, see that a horse, say, is suffering from a disease, is displaying a pathological condition? Can't anyone see that an injured bird has a wing that isn't working properly?' (*WPF*, 198).

Later in the text, when critiquing John Pollock's naturalistic case for proper function, Plantinga suggests in a footnote that health might assist Pollock's case, but asks rhetorically '[I]sn't health just another of that interdefinable set of notions of which the naturalist needs a naturalistic explanation?' (*WPF*, 200, n. 10). There is more, but this is sufficient to show that Plantinga insists the naturalist is no better off with health *et al.* than with proper function *et al.*: both ultimately commit the naturalist to the design hypothesis.

The reasons behind this response are weak, particularly given that the response is not supported by Plantinga's own arguments for premise (1). Remember that the complaint about the naturalist's use of proper function arises from the claim that all paradigm cases of proper function involve human artifacts. Now, we have granted this point for the sake of argument, but if interdefinable terms have identical paradigm cases, then health, injury, disease and pathology cannot be interdefinable with proper function; for it is plainly false that the clear and unambiguous cases of health *et al.* involve human artifacts. Is my car clearly and unambiguously healthy? How about my friend's tyre with a slow leak: is it injured? If the pump we have built stops working, shall we say it has a disease? Or has it died? What Plantinga seems to have very strangely overlooked is that some of the terms he denies the naturalist can use coherently seem to apply literally only in the organic world, but only by analogy to the artifactual realm.

If we follow Plantinga and adopt a paradigm-case approach to conceptual analysis, making sure to include reference to interdefinable conceptual families, then we can distinguish paradigmatic organic concepts like health *et al.* from paradigmatic artifactual concepts like proper function and a design plan.[7] These two families may connect and overlap, but the paradigm cases of the one need not be identical to those of the other. Therefore, the naturalist need not be threatened by the fact that all paradigm cases of proper function involve human artifacts; he can respond that many (if not all) paradigm cases of normativity in the organic world can be covered by concepts like health, injury, sickness, etc., which do not utilize human artifacts in their paradigm cases.

Also notice that Plantinga's 'natural and unavoidable' cases of organic proper function can be re-described in fully organic terms, suggesting analogies drawn from the organic terms can ground the artifactual descriptions. For example, 'We think a hawk's heart that beats only twenty-five times a minute is not functioning properly' (*WPF*, 196) turns into something like 'The heart of a hawk that beats only twenty-five times a minute is diseased, or pathological, or suffering a stroke, or a heart attack, or is on its way to death.' Presumably, a healthy hawk's heart

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does not beat twenty-five times a minute; we require no designer analogy to understand this claim.

Consider a few more examples. 'AIDS damages the immune system and makes it function poorly' (*WPF*, 196) can be read as 'AIDS interferes with the body's ability to withstand disease'. Likewise, 'multiple sclerosis causes the immune system to malfunction in such a way that white blood cells attack the nervous system' (*ibid.*) can be re-described as 'multiple sclerosis is a disease that inhibits the body's immune system so that white blood cells attack the nervous system'. Finally, 'that the purpose or function of the heart is to pump blood, not to make that thumpa-thumpa sound' (*ibid.*) can be recast as 'healthy hearts pump blood, but it is irrelevant to the health of their organism that they make a thumpa-thumpa sound insofar as making that sound is independent of pumping blood'. I could go on, but I think it obvious that we can translate the alleged problem cases of organic normativity (e.g. 'My heart functions properly when') into non-artifactual terminology.

There is another reason for the naturalist to draw upon the organic family of terms. Plantinga frequently claims that not just organs, but entire organisms, have proper functions:

> What is it, after all, for a natural organism – a tree, for example, or a horse – to be in good working order, to be functioning properly, to be functioning the way it ought to, to be functioning in accord with its design plan? Isn't a trout decomposing in a hill of corn functioning just as properly, so far as nature herself goes, as one happily swimming around chasing minnows? (*WPF*, 195)

I will grant that naturalists will concede there is a 'good working order' for living beings based on the nature of the organism in question, but do whole living beings literally have proper functions? Does a trout really have proper, as opposed to improper, function(s)? Is there really one or more proper functions for a tree, or a horse? One can understand how his Christian theism motivates Plantinga to think seriously that there is one or more proper functions for salamanders, trees, and humans all decreed by their maker, but he loses the intuitions of much of his naturalistic readership – and perhaps much of his theistic readership as well – when he makes this thought explicit.[8]

The argument from proper function's persuasiveness depends heavily on shared intuitions about proper function and its application. Proper function and its interdefinable family of artifactual terms may be fairly non-jarring when analogously applied to organs and organic systems, but not so when applied to entire organisms. Health and its interdefinable family of organic terms, on the other hand, seem eminently applicable to entire organisms in addition to organs and organic systems. So there is reason for the naturalist to think that the organic cluster of terms, those which do not have designer intentions within their paradigm cases, are at the root of proper-function ascriptions to the natural world; PAP is not as serious a problem for the naturalist as Plantinga makes it out to be.[9]

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## Naturalistic analyses of proper function

For the moment, assume PAP is a genuine problem for the naturalist: assume the paradigm cases of proper function *et al.* are artifactual, and that what I have called the organic members of that '*et al.*' are interdefinable with the artifactual terms in some way which fails to obviously vindicate the naturalist.[10] To Plantinga, this suggests that applying proper function and its artifactual family outside of the artifactual realm is prima facie incoherent. The supernaturalist, specifically the theist, can solve this problem via an analogy with divine design, but the arguments in favour of premise (2) are intended to convince the reader that metaphysical naturalism cannot similarly cope. What is it that Plantinga eventually concludes the naturalist cannot do? How does he fail to cope? Obviously, the naturalist's failure involves the concept of proper function; but what is it the naturalist cannot do regarding this notion which, if he could, would allow coherent claims of organic proper function?

Here are some of Plantinga's initial suggestions about the naturalist's inability. Referring to the distinction between proper functions in accord with intentional design, and proper functions which the maker never intended, he writes: 'It is easy to understand this in terms of the forethought and intention of a conscious and purposeful agent, and hard to understand it in any other way' (*WPF*, 195)[11] Next, 'From this perspective [i.e. theism] it is easy enough to say what it is for our faculties to be working properly: they are working properly when they are working in the way they were intended to work by the being who designed and created both them and us' (*WPF*, 197).

The idea seems to be this: the naturalist who wants to avoid the design implication of his proper-function talk must show that he can understand proper function in some way that does not rely on ideas that imply or presuppose conscious design; similarly, he must be able to say what it is for things like our faculties to function properly, but without invoking terms that can only be made sensible in a context of conscious, rational design. How does Plantinga think this would be done? The suggested answer comes at the very end of premise (1)'s defence: 'the real question is whether there is a satisfactory *naturalistic* explanation or analysis of the notion of proper function' (*WPF*, 198). Plantinga does not suggest explanations and analyses might differ from one another, and the final sentence reads: 'I turn now to some representative attempts to give just such an analysis of that notion' (*WPF*, 198).

Thus, the naturalist seeking to resolve PAP, in a way which does not commit him to theism, requires a satisfactory naturalistic analysis of proper function; presumably, this would show that the naturalist really could both understand proper function (and its distinctions), as well as say what it is for things, like our faculties, to be functioning properly. The case for premise (2) aims to convince readers that the naturalist cannot satisfyingly analyse proper function; it does this

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by examining three naturalistic attempts to analyse proper function, viz. those of John Pollock,[12] Ruth Millikan,[13] and John Bigelow and Bruce Pargetter.[14]

## Standards of analytic success

Given the naturalist's task, we should be clear about what standard, exactly, must be met to make an analysis satisfactory. More specifically, what does Plantinga think makes an analysis satisfactory? To find the answer one need only examine a few of his objections against these proposals. Consider John Pollock, Plantinga's first representative of naturalism, according to whom generalizations about how things function – functional generalizations – operate against a *ceteris paribus* assumption that Plantinga plausibly interprets as proper function: 'The [functional] generalizations we formulate [about machines] are really about how machines work when they ''work properly'' or when they ''are not broken.'' Similarly it seems that generalizations about organisms should be understood as being about the way they work when they are ''working normally''' (*WPF*, 199).[15]

Pollock analyses this use of proper function in terms of statistical probability: things function properly when they function as they usually, or commonly, function; functional generalizations are made on the assumption that things are functioning as they most commonly function. Against this, Plantinga argues that Pollock's account would deny that sperm have the function of fertilizing eggs, since most sperm do not successfully fertilize eggs. Similarly, Pollock's analysis implies that carpenters who have reached sixty years of age, yet who have all of their fingers intact, fail to have properly functioning hands; and that baby turtles who, unlike most baby turtles, survive to adulthood, are dysfunctional. Plantinga insists that this result is wrong: lucky sperm are not dysfunctional because of their exceptional accomplishments any more than lucky carpenters with all their fingers have dysfunctional hands. The problem, he concludes, is that Pollock's analysis does not provide a necessary condition for proper function; things can function properly without such function being statistically common.

The lesson, so far, is that successful analyses should provide necessary conditions for the concept being analysed; further, given Plantinga's counter-examples, we may infer that successful analyses should be able to declare actual, real-world examples of proper function, established by our pre-analytic intuitions, to indeed be instances of proper function.[16] But there is more: Plantinga also faults the three proposed naturalistic analyses for failing to provide sufficient conditions for proper function; and many of his counter-examples, against both their necessity and sufficiency, are imaginary counter-examples drawn not from what is actual, but what is allegedly logically possible.

Consider Ruth Millikan's theory of proper function, which Plantinga renders as follows: 'an organ or system or organism *O* is working properly in working a certain way, if it has ancestors, and its ancestors' working in that way contributed

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to the survival of those ancestors, and hence to the existence and character of *O*' (*WPF*, 202). Plantinga provides the following logically possible counter to Millikan's theory:

> A Hitler-like madman gains control: as part of his Nietzschian plan to play God, he orders his scientists to induce a mutation into selected non-Aryan victims. Those born with this mutation can't see at all well (their visual field is a uniform shade of light green with little more than a few shadowy shapes projected on it). When they open their eyes and use them, furthermore, the result is constant and severe pain, so severe that it is impossible for them to do anything except barely survive. They are unable to listen to music, or read (or write) poetry or literature; they can't do mathematics or philosophy or evolutionary biology; they can't enjoy humor, play, adventure, friendship, love, or any of the other things that make human life worthwhile. Their lives are poor, nasty, brutish and short. Hitler and his henchmen also begin a systematic and large-scale program of weeding out the non-Aryan nonmutants before they reach reproductive maturity. The mutation spreads; it gets out of control; after a few generations the bulk of the world's population displays it and the number of nonmutants dwindles. (*WPF*, 203–204)

The point of this fiction is this: if this story extended to some mutant of the distant future, then this mutant would have mutant ancestors whose visual faculties worked in the Hitler-induced, mutated way; further, the fact that their eyes worked that way contributed to their survival and proliferation, and so to the existence and character of the future mutant's visual faculties. Thus, Millikan's theory would declare the future mutant's mutated eyes to be functioning properly. Plantinga's pre-analytic intuitions, on the other hand, insist this is the wrong result, and so he thinks that Millikan's analysis does not provide sufficient conditions for proper function: her analysis can be satisfied yet there be no proper function.

To Plantinga's thinking, a satisfactory naturalistic analysis of proper function must provide both necessary and sufficient conditions; and it must do so not only for real-world cases about sperm and turtles, but unrealistic cases involving a Hitler-like madman with a 'Nietzschian plan to play God'. Ultimately, Plantinga thinks successful analyses of proper function must be able to provide both necessary and sufficient conditions which can stand against any logically possible counter-example.

In case there is any doubt that logical possibility is the standard – one might suggest the Hitler example is possible in a way that is more robust than mere logical possibility – consider Plantinga's critique of Bigelow and Pargetter. According to their account, an organ or system has a function if and only if it somehow confers a survival-enhancing propensity in its owner's natural habitat; from this Plantinga infers that proper function is, for them, related to survival. Here is one of his objections to this relationship:

> According to contemporary evolutionary theory, we humans beings along with the rest of the multifarious forms of life on this planet arose by way of natural selection (and perhaps such other processes as random genetic drift) working on some form of genetic

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> variation … This view has currently achieved the status of orthodoxy; still, as Bigelow and Pargetter point out … it is at best *contingently* true. It is *possible*, in the broadly logical sense, that the view is flatly false … . If so, however, no correct account of proper function can *presuppose* the truth of contemporary evolutionary theory – that is, presuppose it in the sense that if the account is correct, then any case of proper function must be related in some fairly strong way to survival. (*WPF*, 208)

Plantinga does not suggest, here, that contemporary evolutionary theory is false, merely that in a broad sense it is logically possible that it is false; the lesson, apparently, is that an analysis of proper function which presupposes something which is possibly false in this broad sense can be dismissed. Since that which is not possibly false in this sense must be logically necessary, it follows that, for Plantinga, a satisfactory analysis of proper function must be necessarily true, true in all possible worlds; anything less is susceptible to a logically possible counter-example.

## Questioning Plantinga's standards

Obviously, these are very stringent standards of analytic success; why should the naturalist agree that his use of organic proper function is incoherent if he cannot provide a logically necessary analysis of that notion? Even if there is a prima facie implication of conscious design embedded within the concept, proper function, why grant that the only way to rebut this implication is to provide something as stringent as a logically necessary analysis, an analysis that can account for not just cases from the real world, but any fanciful scenario which manages to avoid logical contradiction?

Plantinga cannot insist that the naturalist need do so because such analyses are plentiful; it is a philosophical commonplace that such analyses are not plentiful and easy to come by, but are instead rare and extremely difficult, if not impossible, to produce in most fields of enquiry.[17] If it is true that we must provide such analyses of any concept we wish to use coherently, but non-paradigmatically, then much of our concept use may be incoherent; this will not be a problem faced only by the naturalist.

Nor do I think Plantinga can insist the naturalist must meet these standards of analysis because the theist can. Foremost, even if the theist could meet such standards, it may not follow that the coherent naturalist must be likewise able to do so. But it is not obvious that Plantinga's theistic analysis of proper function does meet these standards. Unfortunately, Plantinga does not explicitly argue that divine design is necessary and sufficient to account for proper function in all logically possible circumstances; all he says on this count can be summed up with the claim that things work properly 'when they are working in the way they were intended to work by the being who designed and created … them' (*WPF*, 197).

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If the standards of conceptual analysis are as tight as Plantinga suggests, then I think it fairly simple to argue that the preceding theistic analysis is unsatisfying. Ironically, the point Plantinga uses against Bigelow and Pargetter can be used to argue that a theistic designer analysis is not necessary for proper function; unless proper function without rational design is logically impossible, it is logically possible that Plantinga's theistic account is not necessary for proper function, and can therefore be dismissed. Given that philosophers, Plantinga among them, frequently treat deceiving Cartesian demons and Russell's five-minute-old world as viable, if extreme, logical possibilities, it seems churlish to insist that organic proper function without a designer is logically impossible on the basis of what Plantinga provides via the argument from proper function.[18]

Regarding sufficiency, cases against the sufficiency of Plantinga's theistic analysis of proper function can be made which are just as plausible as his cases against the sufficiency of various naturalistic accounts. For example, consider the thought-experiment which involved Hitler and his eye-ruining machinations. Grant Plantinga's pre-analytic intuitions that our eyes function properly as they do in the real world, not as they would after Hitler's mutations, but slightly alter the example: substitute agents of our designer, or our designer himself, for Hitler; for reasons we cannot fathom – mysterious ways – God has induced the dreaded useless-green-vision-with-pain mutation. What do our pre-analytic intuitions tell us now? I suspect there will be a split: those who are reverential toward divine design will insist that God can make proper function to be whatever He likes, and that the mutated eyes function properly; those naturalists (and many not-so-reverential theists) who decide that considerations independent of designer intentions are relevant to proper function ascriptions will demur.[19] Even assuming we are artifacts of divine design, it is not obviously incoherent to say, in response to this divine plague, something like 'I wish my eyes were not malfunctioning, but instead worked properly, the way they used to before God decided to sabotage them.' Divine design is not sufficient for proper function in all logically possible scenarios.

The standards of analysis with which Plantinga wishes to convince the naturalist that the latter cannot say what it is for something organic to function properly, to understand and coherently express claims like 'The function of the heart is to do such-and-such', are too high. I do not think that his own account, undeveloped as it is, meets such standards, but even if it did it is not obvious that the naturalist should be too worried. As Louis Pojman suggests when discussing the argument from proper function, 'Perhaps we should not expect exact definitions of biological concepts. After all, we don't have a watertight definition of most of the important biological concepts: ''life,'' ''species,'' and ''gene.'' Perhaps the same goes for the concept ''function''.'[20]

I suspect Pojman is correct, and further think that this lack of exact, watertight, necessary and sufficient conditions is not limited to the realm of biological

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concepts: perhaps mathematics and logic are the most obvious realms where these might be appropriate conceptual standards, but I am unaware of success stories elsewhere. The burden of proof is upon Plantinga to show that these standards are appropriate to conceptual analysis either in general or particularly in the philosophy of biology, and in so arguing he should address the apparent paucity of successful analyses of this sort. Plantinga's efforts to demonstrate that three separate accounts of function and proper function fail to meet such standards does little to suggest that naturalists cannot understand what it is for the heart to function properly, or coherently say 'My liver is doing what it should be doing.'

## The paradigm-case model

Elsewhere in *WPF*, Plantinga gives reason to reject the stringent analytic standards with which he tries to overwhelm the naturalist. When laying the groundwork for his own analysis of the epistemic notion warrant he writes:

> I must acknowledge a complication with respect to my way of thinking of warrant. I aim at something in the neighborhood of an *analysis* of warrant: an account or exploration of our concept of warrant, a concept nearly all of us have and regularly employ. (As we all know, desperate difficulties best any attempt to say precisely what analysis *is*.) Thus at the least I should be looking for necessary and sufficient conditions. But I very much doubt that there *is* any short and elegant list of conditions at once severally necessary and jointly sufficient for warrant. This is a way in which philosophy differs from mathematics; and epistemology differs more from mathematics, along these lines, than, for example, philosophy of logic or the metaphysics of modality. Our concept of warrant is too complex to yield to analysis by way of a couple of austerely elegant clauses. (*WPF*, ix)

This acknowledgment may come as a bit of a revelation to the naturalist wrestling with premise (2), treating Plantinga's barrage of counter-examples as legitimate philosophical missiles. Here is a fuller explanation of what I call Plantinga's 'paradigm-case model':

> The structure of [warrant], I believe, involves a central picture, a group of central paradigms – clear and unambiguous cases of knowledge – surrounded by a penumbral belt of analogically related concepts, concepts related by different analogies and standing in different degrees of closeness to the aboriginal paradigms. Between the central core area and this penumbral belt there is a more shadowy area of borderline possible cases, cases where it isn't really clear whether what we have is a case of warrant in the central sense, or a case of one of the analogically extended concepts, or neither of the above; and beyond the penumbral belt we have another area of borderline cases.
>
> Hence perhaps a good way to characterize our system of analogically related concepts of warrant is to give first, the conditions necessary and sufficient for the paradigmatic core. (Even here, as we shall see, there is no stylishly sparse set of necessary and sufficient conditions: various qualifications, additions and subtractions are necessary.) Second, what is needed is an exploration of some of the analogical extensions, with an explanation of the analogical bases of the extensions. This way of proceeding is less

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> elegant and pleasing and more messy than the analysis that we learned at our mother's knee: it is also more realistic. (*WPF*, ix)

It should be realized that this method can be used against premise (2) by motivating the naturalist to reject the demand for necessary and sufficient conditions in all logically possible cases as an unrealistic demand; at best, the hunt for necessary and sufficient conditions should go on in the paradigm cases, not in all logically possible cases. Most of Plantinga's counter-examples do not concern paradigm cases of proper function if we take seriously that which Plantinga tries to convince us motivated the search for a naturalistic analysis of proper function in the first place. I will elaborate on this claim.

If the naturalist agrees with Plantinga that the realm of human artifacts provides the 'ancestral home', the paradigm cases, of proper function, and if he adopts the paradigm-case model, then he has a very Plantingan reason to be unconcerned about any alleged inability to provide necessary and sufficient conditions for organic proper function. Either proper function in the organic world is paradigmatic or it is not: if proper function in the natural world is not paradigmatic proper function, then it is not in need of any such defence, since the paradigm-case model only requires such defence for the paradigm cases; on the other hand, if organic proper function can be paradigmatic, the necessary context for premise (2), provided by premise (1), is completely undercut. As Plantinga admits when defending this argument against Swinburne, the mission of premise (2) on its own is insufficient to draw the argument from proper function's conclusion:

> Perhaps it is true that our concept of proper function doesn't have nontrivial necessary and sufficient conditions, but if that is true, it is not in my opinion a defect in the concept; in particular, it isn't grounds for supposing the concept unintelligible. (Many magnificently intelligible concepts do not have nontrivial necessary and sufficient conditions – for example, *red*, *horse*, and *belief*.)[21]

This is not to say that the naturalist need not offer any explication of proper function in the natural world: he could try, for example, to provide analogical extensions from the paradigm cases. But he need not be concerned with the sorts of objections that are brought to bear by Plantinga's arguments for premise (2). Unless some reason is offered to deny, with Plantinga, that stringent standards of analysis are appropriate to epistemology, but still insist they are suitable for the philosophy of biology, the domain of the proper function issue, Plantinga has not coherently explained why the naturalist cannot sensibly claim both to understand proper function, and to say what it is.[22,23]

## Notes

1. Alvin Plantinga *Warrant and Proper Function* (New York NY: Oxford University Press, 1993).
2. See, for example, the essays contained in James Beilby (ed.) *Naturalism Defeated? Essays on Plantinga's Evolutionary Argument Against Naturalism* (Ithaca NY: Cornell University Press, 2002).

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3. To date, the only articles which focus exclusively on this argument are Michael Levin 'Plantinga on functions and the theory of evolution', *Australasian Journal of Philosophy*, **75** (1997), 83–98; Peter Markie 'Plantinga, metaphysical naturalism and proper function', *Southwest Philosophy Review*, **15** (1999), 65–72. Richard Swinburne, Bruce Hunter, and Graham Oppy have also addressed the argument, although each does so as part of a larger critique. See Richard Swinburne 'Response to warrant', *Philosophy and Phenomenological Research*, **55** (1995), 415–419; Bruce Hunter 'Knowledge and design', *Philosophy and Phenomenological Research*, **59** (1999), 309–334; Graham Oppy 'Natural theology', in Deane-Peter Baker (ed.) *Alvin Plantinga* (New York NY: Cambridge University Press, 2007), 32–34.
4. Larry Wright serves as an example of such a naturalist: 'Specifically, it seems to me consistent, appropriate, and even common for an atheist to say that the function of the kidney is elimination of metabolic wastes'; *WPF*, 195, citing Larry Wright 'Functions', *Philosophical Review*, **82** (1973), 82.
5. In a nutshell, warrant is that property or quality of a belief which is responsible for distinguishing full-blown knowledge from merely true belief. According to proper functionalism, a belief is warranted if (and only if) it is produced by cognitive faculties which are functioning properly in an environment suitable for their operation; as well, said faculties must be both reliable and truth-oriented. If a belief satisfies these conditions then its degree of warrant will correspond to the confidence with which the belief is held.
6. Elsewhere he agrees intention is not sufficient for proper function (see *WPF*, ch. 2; cf. 196, n. 2).
7. Granting, of course, that the paradigm cases of proper function really are artifactual. Note that the application of organic terms like 'health' to artifacts is much more strained, although still comprehensible, than the application of alleged artifact terms like 'proper function' to the organic world. This suggests that it is much more plausible that the paradigm cases of health *et al.* are exclusively organic than that the paradigm cases of proper function *et al.* are exclusively artifactual.
8. And this problem only gets worse when we find that Plantinga's intuitions tell him garden patches and ecosystems have proper functions (see *WPF*, 198). Indeed, even if he had not admitted this we could have inferred it: for if divine design entails design plans, and therefore proper functions, then theism implies the entire created world will have a proper function; so will any of its constituents which can be said to possess a design plan. Even if some naturalists will agree with Plantinga that entire organisms have functions and proper functions (e.g. survival and reproduction), I doubt many will intuit that, say, the proper function of rain is to nourish the earth and its living inhabitants.
9. There is reason for both naturalists and theists to see their organic uses of proper function this way. Following Richard Swinburne's 'Response', I suggest theists and naturalists alike have two sets of concepts regarding artifactual and organic normativity: Swinburne describes them as the 'naturalistic' and the 'supernaturalist' concepts of proper function; Plantinga thinks 'naturalistic' and 'designer' are more accurate (see Plantinga 'Reliabilism, analyses and defeaters', *Philosophy and Phenomenological Research*, **55** (1995), 454–455), but I think 'organic' and 'artifactual' are better still. Those things Plantinga considers organic proper functions can be understood with the organic family of terms, without taking on the divine-design analogy and certainly without taking on the origins implied by that analogy. This is, I suspect, because theists and atheists alike really do typically understand the use of 'proper function' in the natural world as an analogous extension of our organic notions into mechanical-sounding language. The designer analogy can only clumsily shadow what we learn via our naturalistic (i.e. non-design) understanding of the organic world, tacking to the end of any ascription of organic proper function 'and it is this way because God made it so'. Given the lack of plausible divine revelations concerning these matters, it seems doubtful that divine intentions really can figure, analogically or otherwise, too extensively into our discoveries of, and theories about, proper function; a fortiori they seem irrelevant to our ascriptions of the term.
10. I will not assume, however, that the paradigm cases of organic health *et al.* are artifactual since this is obviously false.
11. More formally, this is the distinction between the design plan and the max plan; the former is a list of those proper functions anticipated/intended by the designer; the latter is a list of how something functions in all logically possible scenarios. It is unclear to me how the distinction arises when the designer in question is omniscient. See *WPF*, 22–24 for the full explication of the distinction.
12. See John Pollock 'How to build a person: the physical basis for mentality (volume 1: metaphysics)', *Noûs Supplement: Philosophical Perspectives*, **1** (1987), 109–154.

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13. See Ruth Millikan *Language, Thought, and Other Biological Categories: New Foundations for Realism* (Cambridge MA: MIT Press, A Bradford Book, 1984).
14. See John Bigelow and Bruce Pargetter 'Functions', *Journal of Philosophy*, **84** (1987), 181–196.
15. Quoting Pollock 'How to build a person', 148.
16. One could try to face these counter-examples head on. For example, we might agree that it is not the proper function of sperm to fertilize eggs, but rather to do something that most sperm do, statistically speaking, end up doing (e.g. wriggling through seminal fluid); fertilization would be the proper function of some entity or process that does, with sufficient statistical propensity, lead to fertilization. But I do not wish to pursue this point, here, and will accept, with Plantinga, that some proper functioning is not statistically normal.
17. It is recognition of this point that seems to drive Plantinga toward his paradigm-cases model of conceptual analysis (see below).
18. See *WPF*, 62, 208, for examples of Plantinga's invocations of Russell's case and a deceiving Cartesian demon.
19. Perhaps the split will fall on the same line as that between those who think God can make anything at all moral, and those who think a morality which is so arbitrary is no morality at all.
20. Louis Pojman *What Can We Know? An Introduction to the Theory of Knowledge* (Belmont CA: Wadsworth, 1995), 165. Cf. Swinburne: 'The trouble with this argument of Plantinga [*sic*] is that the fact that the naturalist cannot give a useful necessary-and-sufficient conditions analysis of ''proper function'' doesn't mean that it isn't an intelligible and applicable concept – see of course Wittgenstein's discussion of the notion of a ''game'', and what Plantinga himself says about ''knowledge''. All that is [*sic*] means is that ''proper function'' in the naturalistic sense, like ''game'', is a term whose criteria of correct use are established so predominantly by standard examples of correct application and so little by its logical relations to other terms that for kinds of examples remote from clear standard examples, it is unclear what counts as ''proper functioning''''; Swinburne 'Response to warrant', 417.
21. Plantinga 'Reliabilism, analyses and defeaters', 454, n. 26.
22. Ruth Millikan suggests there is a distinction between conceptual analysis, finding necessary and sufficient conditions for applying terms which cohere with our intuitions, and theoretical definitions which are acceptable insofar as they are part of a successful scientific theory of the phenomenon in question. She has a rather low regard for conceptual analysis: 'Now I firmly believe that ''conceptual analysis,'' taken as a search for necessary and sufficient conditions for the applications of terms, or as a search for criteria for application by reference to which a term has the *meaning* it has, is a confused program, a philosophical chimera, a squaring of the circle, the misconceived child of a mistaken view of the nature of language and thought'; Ruth Millikan 'In defense of proper functions', reprinted in Colin Allen, Marc Beckoff, and George Lauder (eds) *Nature's Purposes: Analyses of Function and Design in Biology* (Cambridge MA: MIT Press, A Bradford Book, 1998), 297.
23. I would like to thank Michael Martin for providing comments upon earlier drafts of this article, both before and after it was a chapter in my dissertation. I would also like to thank Sylvia Bryce-Wunder for greatly improving the penultimate draft by not letting me use 'broadly logically possibly false' in more than one sentence.

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