A Naturalist on *The Edge of Evolution*: Why Thomas Nagel Should Embrace ID

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Abstract

This paper review's Thomas Nagel's partial agreement with Michael Behe's argument for design given in *The Edge of Evolution* (Free Press, 2007), and argues that Nagel's reticence about embracing intelligent design theory stems from philosophical inconsistency on his part.

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'We know intuitively that Darwinism can accomplish some things, but not others. The question is what is that boundary? Does the information content in living things exceed that boundary? Darwinists have never faced those questions.'

- Dr Michael Egnor[1]

Charles Darwin's theory of evolution by natural selection was a good scientific hypothesis well worth checking out; but 150 years of checking in numerous scientific fields have indicated that Darwin was *only partly right*: 'Yes, small-scale evolution is a fact', writes molecular biophysicist Cornelius G. Hunter, 'but there is no reason to think it is unbounded. In fact, all our data suggests that small-scale evolution *cannot* produce the sort of large-scale change Darwinism requires.'[2]

In *The Edge of Evolution* (Free Press, 2007), microbiologist and design-theorist Michael J. Behe elucidates why adaptationalism is a bounded process of only limited efficacy:

> Now that we know the sequences of many genomes, now that we know how mutations occur, and how often, we can explore the possibilities and limits of random mutation with some degree of precision . . . how far apart do biological points A and B have to be, and how rugged the pathway between them, before random mutation and natural selection start to become ineffective?[3]

Behe extrapolates from evidence drawn from the natural history of the malaria parasite and the HIV virus to conclusions about what it is biologically reasonable to think that evolution can have accomplished within the time-frame and population sizes available to it. The lessons of such studies, says Behe, are both profound and unexpected:

> 1) Darwinian processes are incoherent and highly constrained; and 2) the battle of predator and prey (or parasite and host), which has often been portrayed by Darwinist writers as a productive arms-race cycle of improvements on each side, is in fact a destructive cycle, more like trench warfare, where conditions deteriorate. The changes in the malaria genome are even more highly instructive, simply because of the sheer numbers of parasites involved. From them we see: 3) Like a staggering, blindfolded drunk who falls after a step or two, when more than a single tiny step is needed for an evolutionary improvement, blind random mutation is very unlikely to find it. And 4) extrapolating from the data on an enormous number of malaria parasites allows us to roughly but confidently estimate the limits of Darwinian evolution for all of life on earth over the past several billion years.[4]

Behe argues that it is unreasonable to attribute any evolutionary outcome requiring more than a handful of co-ordinated mutations before there is a net beneficial selectable effect to the processes of evolution (in point of fact, he draws this boundary condition at four mutations). Beyond this empirically inferred 'edge' of evolution's proven capacity to shape life, the only explanation with a known capacity to get the job done is design. This observation leads Behe to conclude that:

> Most mutations that built the great structures of life must have been non-random . . . The major architectural features of life – molecular machinery, cells, genetic circuitry, and probably more – are purposely designed. But the architectural constraints leave spandrels that can be filled with Darwinian adaptations.[5]

Behe reckons:

> animal design probably extends into life at least as far as vertebrate classes, maybe deeper, and that random mutation likely explains differences at least up to

> the species level, perhaps somewhat beyond. Somewhere between the level of vertebrate species and class lies the organismal edge of Darwinian evolution.[6]

Nagel on *The Edge of Evolution*

In 'Public Education and Intelligent Design' atheist philosopher Thomas Nagel proclaims a significant degree of agreement with Behe's argument, whilst professing agnosticism concerning Behe's conclusion of design. Nagel states: 'My own situation is that of an atheist who, in spite of being an avid consumer of popular science, has for a long time been skeptical of the claims of traditional evolutionary theory to be the whole story about the history of life.'[7] In Nagel's view:

> Sophisticated members of the contemporary culture have been so thoroughly indoctrinated that they easily lose sight of the fact that evolutionary reductionism defies common sense. A theory that defies common sense can be true, but doubts about its truth should be suppressed only in the face of exceptionally strong evidence.[8]

Thus Nagel agrees with Behe that the burden of proof is on those who doubt design. As Behe argues in the 10th anniversary second edition of *Darwin's Black Box* (Free Press, 2006):

> A crucial, often-overlooked point is that the overwhelming appearance of design strongly affects the burden of proof: in the presence of manifest design, the onus of proof is on the one who denies the plain evidence of the eyes. For example, a person who conjectured that the statues on Easter Island or the images on Mount Rushmore were actually the result of unintelligent forces would bear the substantial burden of proof the claim demanded. In those examples, the positive

> evidence for design would be there for all to see in the purposeful arrangements of parts to produce the images. Any putative evidence for the claim that the images were actually the result of unintelligent processes (perhaps erosion by some vague, hypothesized chaotic forces) would have to clearly show that the postulated unintelligent process could indeed do the job. In the absence of such a clear demonstration, any person would be rationally justified to prefer the design explanation.[9]

Behe distinguishes between common descent and adaptationism, accepting the former but rejecting the latter as the explanation for (most of) the former:

> Random mutation, natural selection, common descent – three separate ideas welded into one theory . . . In brief, the evidence for common descent seems compelling . . . Second, there's also great evidence that random mutation paired with natural selection can modify life in important ways. Third, however, there is strong evidence that random mutation is extremely limited.[10]

Like Behe, sociologist of science Steve Fuller distinguishes between:

> observable, often experimentally induced, 'microevolution' in the laboratory, and more speculative inferences concerning 'macroevolution' in the distant past based on the fossil record. The neo-Darwinian synthesis consists largely of an extended promissory note to the effect that these two senses of 'evolution' are ultimately the same.[11]

Arguing for macro-evolution from the fossil record doesn't show that common descent is explicable in terms of an extrapolated micro-evolutionary process. Indeed, most of *The Edge of Evolution* is devoted to showing that, far from making good on Fuller's

'promissory note', a straight-forward extrapolation from the evidence of micro-evolution shows that the macro-evolutionary explanation is all but empty (the explanatory merits and scientific status of design is an separate issue). Behe urges: 'Properly evaluating Darwin's theory absolutely requires evaluating random mutation and natural selection *at the molecular level*.'[12] Nagel agrees:

> Are the sources of genetic variation uniformly random or not? That is the central issue, and the point of entry for defenders of ID. In his recent book, *The Edge of Evolution*, Michael Behe examines a body of currently available evidence about the normal frequency and biochemical character of random mutations in the genetic material of several organisms: the malaria parasite, the human immunodeficiency virus (HIV), the bacterium E. coli, and humans. He argues that those widely cited examples of evolutionary adaptation, including the development of immunity to antibiotics, when properly understood, cannot be extrapolated to explain the formation of complex new biological systems. These, he claims, would require . . . mutations whose random probability, either as simultaneous multiple mutations or as sequences of separately adaptive individual mutations, is vanishingly small. He concludes that alterations to DNA over the course of the history of life on earth must have included many changes that we have no statistical right to expect, ones that were beneficial beyond the wildest reach of probability . . . he believes that random mutation is not sufficient to explain the range of variation on which natural selection must have acted to yield the history of life . . . This seems on the face of it to be a scientific claim, about what the evidence suggests, and one that is not self-evidently absurd. I cannot evaluate it; I merely want to stress its importance for the current debate.[13]

Nagel carefully distinguishes skepticism about adaptationalism from advocating design: 'Skepticism about the standard evolutionary model is not limited to defenders of ID.'[14] However, Nagel re-iterates the significance of Behe's argument:

> even if one merely regards the randomness of the sources of variation as an open question, it seems to call for the consideration of alternatives . . . A great deal depends on the likelihood that the complex chemical systems we observe arose through a sufficiently long sequence of random mutations in DNA, each of which enhanced fitness. It is difficult to find in the accessible literature the grounds for evolutionary biologists' confidence about this.[15]

He references:

> Confidence expressed by Jerry Coyne . . . in his review of *The Edge of Evolution*: 'Behe furnishes no proof, no convincing argument, that [protein-protein] interactions cannot evolve gradually. In fact, interactions between proteins, like any complex interaction, were certainly built up step by mutational step, with each change producing an interaction scrutinized by selection and retained if it enhanced an organism's fitness' (*The New Republic*, June 18, 2007, p. 42).[16]

Behe does *not* argue that protein-protein interactions 'cannot evolve gradually', but only that 'complexes with more than two different binding sites – ones that require three or more different kinds of proteins – are beyond the edge of evolution.'[17] And Behe *does* furnish 'proof':

> Where is it reasonable to draw the edge of evolution? . . . On the one side are our very best examples – from humanity's trench war with parasites – of what random mutation and natural selection are known to do. We know that single changes to single genes can sometimes elicit a significant beneficial effect. The classic example… is that of sickle cell hemoglobin, where a change to one amino acid confers resistance to malaria . . . More rarely, several mutations can sequentially add to each other to improve an organisms' chances of survival. An example is the

> breaking of the regulatory controls of fetal hemoglobin to help alleviate sickle cell disease. Very, very rarely, several amino acid mutations appear simultaneously to confer a beneficial effect, such as in chloroquine resistance . . . in malaria . . . a 'CCC,' a 'chloroquine-complexity cluster,' . . . A CCC requires, on average, 10^{20}, a hundred billion billion, organisms – more than the number of mammals that has ever existed on earth. So if other things were equal, the likelihood of getting two new binding sites would be . . . the square of a CCC, or one in ten to the fortieth power. Since that's more cells than likely to have ever existed on earth, such an event would not be expected to have happened by Darwinian processes in the history of the world. Admittedly, statistics are all about averages, so some freak event like this *might* happen . . . But it is not biologically reasonable to expect it, or less likely events that occurred in the common descent of life on earth . . . complexes of just three or more different proteins are beyond the edge of evolution.[18]

Nagel cautions Darwinists:

> It is not enough to say . . . that the *in*capacity of evolutionary mechanisms to account for the entire evolution of life has not been conclusively established. That is not required for an alternative to be considered seriously, provided the alternative is not ruled out in advance on other grounds. Those who offer empirical evidence for ID do not have to argue that a completely non-purposive explanation is impossible, only that it is very unlikely, given the evidence available. That is a scientific claim, though a contestable one.[19]

This is precisely what Behe argues. Indeed, peer-reviewed scientific debate about Behe's empirical argument is ongoing.[20] Whilst withholding agreement from Behe, Nagel affirms that no empirical refutation of ID:

> has ever been offered, let alone established. What have been offered instead are necessarily speculative proposals about how the problems posed by Behe might be handled by evolutionary theory, declarations that no hypothesis involving divine intervention counts as science, and assurances that evolutionary theory is not inconsistent with the existence of God.[21]

Against Reticence: Why Thomas Nagel Should Embrace ID

In Nagel's view: 'A theory that defies common sense can be true, but doubts about its truth should be suppressed only in the face of exceptionally strong evidence.'[22] Nagel is 'skeptical of the claims of traditional evolutionary theory. . .'[23] The conjunction of these propositions leaves Nagel endorsing 'common sense', by which I take him to mean the universally acknowledged impression of design in nature. After all: 'The evidence for [evolution] is supposed to be evidence for the absence of purpose in the causation of the development of life-forms on this planet . . . It displaces design by proposing an alterative.'[24] Failure to establish an alternative is failure to displace design.

Nagel views Behe's critique of the extrapolation from 'micro' to 'macro' evolution as a methodologically correct argument that, *if* sound, supports his own scepticism about Darwinism. Yet, despite the fact that he thinks no empirical refutation of ID 'has ever been . . . established'[25], Nagel is reticent about ID. Why? He confesses his reticence has a metaphysical source: 'I do not regard divine intervention as a possibility, even though I have no other candidates.'[26] That is, since a) he has no candidate for the role of designer besides divinity, and b) he regards divine design as impossible, he concludes that he can't embrace ID (Nagel's argument is explicitly person relative).

Regarding a) it's unclear if Nagel thinks there's something relevant to his agnosticism about ID in the fact that (i) he lacks a prior belief in any *actual* candidate designer, or (ii)

in the fact he can't think of a *hypothetical* designer candidate, besides God. Of course, (ii) can only feature as a factor in Nagel's argument *on the condition that he regards divine design as impossible*. However, Nagel most plausibly means (i), both because this interpretation follows naturally from his focus on possibility in the preceding clause about divinity, and because it seems unlikely that he can't conceive any designer candidates besides God.

Given that Nagel means (i), the implied assumption - that rationally accepting a design inference requires prior belief in a plausible designer candidate - is false. Suppose the SETI program discovered a signal telling us how to build a working warp drive engine. It would be irrational *not* to attribute such a signal to design, even if we had a prior belief in the *non*-existence of extra-terrestrials! Design inferences don't depend upon a prior belief in the existence of *actual* designer candidates. They depend upon the belief that it's *possible* that a designer *might* exist: 'ID . . . requires only that design be admitted as a possibility . . .'[27] Moreover, *this* assumption is bound up in Nagel's recognition that the common sense design alternative to Darwinism carries the presumption of truth (since real design entails a real designer, and *real* designers must of course be *possible*).

Regarding (b), Nagel admits: 'I recognize that this is because of an aspect of my overall worldview that does not rest on empirical grounds or any other kind of rational grounds.'[28] As Nagel candidly comments in *The Last Word* (Oxford University Press, 1997):

> I want atheism to be true and am made uneasy by the fact that some of the most intelligent and well-informed people I know are religious believers. It isn't that I don't believe in god and, naturally, hope that I'm right in my belief. It's that I hope there is no God! I don't want there to be a God; I don't want the universe to be like that. My guess is that this cosmic authority problem is not a rare condition and that it is responsible for much of the scientism and reductionism of our time.[29]

This unwarranted atheistic presupposition adversely affects Nagel's assessment of ID:

> I do not think the existence of God can be disproved. So someone who can offer serious scientific reasons to doubt the adequacy of the theory of evolution, and who believes in God, in the same immediate way that I believe there is no god, can quite reasonably conclude that the hypothesis of design should be taken seriously.[30]

Nagel doesn't embrace ID *because he doesn't believe in God*. That's like rejecting a design inference from crop-circles because one doesn't believe in aliens.

Conclusion

To take a design inference seriously, one need only regard the existence of a designer *per se* as a possibility. And recognition that the design hypothesis enjoys the presumption of truth (something Nagel appears to acknowledge) *includes* the recognition that the existence of a designer *per se* is a possibility! Nagel's reticence about ID rests upon a failure to recognize that the design hypothesis provides the embarkation point, rather than the terminus, to debate over the nature of the designer.

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[1] cf. www.dissentfromdarwin.org
[2] Cornelius G. Hunter, *Darwin's Proof*, (Brazos Press, 2003), 60.
[3] Michael J. Behe, *The Edge of Evolution* (Free Press, 2007), 7.
[4] *ibid*, 19.
[5] *ibid*, 83 & 202.
[6] *ibib*, 201.
[7] Thomas Nagel, 'Public Education and Intelligent Design', *Philosophy & Public Affairs* 36, no. 2 (2008), p. 202. Cf. http://as.nyu.edu/docs/IO/1172/papa_132.pdf
[8] *ibid*.
[9] Michael J. Behe, *Darwin's Black Box*, 10th anniversary edition, (Free Press, 2006), 265-266.
[10] Behe, *The Edge of Evolution*, *op cit*, 3.
[11] Steve Fuller, *Science vs Religion*? *Intelligent Design and the Problem of Evolution* (Cambridge: Polity, 2007), 132.

[12] Behe, *op cit*, 10.
[13] Nagel, *op cit*, 192.
[14] *ibid*.
[15] *ibid*, 192 & 199.
[16] *ibid*, endnote 11.
[17] Behe, *op cit*, 146.
[18] *ibid*, 101 & 135. cf. Prof. Ralph Seelke, What Can Evolution *Really* Do?' 'www2.uwsuper.edu/rseelke/What%20Can%20Evolution%20Really%20Do_05.doc; Intelligent Design The Future, 'Micro or Macro? Microbiologist Ralph Seelke on Evolution' http://intelligentdesign.podomatic.com/entry/eg/2008-01-03T12_49_31-08_00; Stuart Pullen, *Intelligent Design or Evolution? Why the Origin of Life and the Evolution of Molecular Knowledge Imply Design* (Raleigh, NC: Intelligent Design Books, 2005); Dr J.C. Sanford, *Genetic Entropy & the Mystery of the Genome* (New York: Elim Publishing, 2005); David Swift, *Evolution under the microscope* (Stirling: Leighton Academic, 2002); John C. Lennox, *God's Undertaker*: *Has Science Buried God*? 2nd edition, (Oxford: Lion, 2009).
[19] Nagel, *op cit*, 199.
[20] cf. Rick Durrett & Deena Schmidt, 'Waiting for Two Mutations: With Applications to Regulatory Sequence Evolution and the Limits of Darwinian Evolution', *Genetics* 180: 1501-1509 (2008) www.genetics.org/cgi/content/full/180/3/1501; Michael J. Behe, 'Waiting Longer for Two Mutations: Published Letter in Response to Durrett & Schmidt', *Genetics* 181: 819-820, (2009) www.discovery.org/a/9461; Durrett and Schmidt, 'Reply to Michael Behe', *Genetics* 181: 821-822 (2009) www.genetics.org/cgi/content/full/181/2/821; Michael J. Behe, "Waiting Longer for Two Mutations" www.discovery.org/a/9611; Michael J. Behe's Amazon Blog www.amazon.com/gp/blog/A3DGRQ0IO7KYQ2/ref=cm_blog_blog/102-1065209-4286505
[21] Nagel, *op cit*, 202.
[22] *ibid*.
[23] *ibid*.
[24] *ibid*, 188. Note that to *displace* design is not that same as *contradicting* design.
[25] *ibid*, 202.
[26] *ibid*, 202-203.
[27] *ibid*, 199.
[28] *ibid*, 202-203.
[29] Thomas Nagel, *The Last Word* (Oxford University Press, 1997), 131.
[30] Nagel, *op cit*.