Book Review

Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False, by Thomas Nagel. New York: Oxford University Press. Pp. 144. H/b £15.99.

The problems with this book begin with the provocative subtitle, bleeding into the introductory chapter and its polemical sequel. Nagel just assumes from the start that modern Darwinism is committed to materialist reductionism. Then he attacks evolutionary theory, as it exists today, for being reductionist. But metaphysical materialism and evolutionary theory are logically independent of each other, so the faults of the former do not transfer to the latter. He thus attacks a straw man. Nagel persistently asserts that proponents of the science of evolution are materialists, calling this the 'orthodox view'; but he gives no citations to actual biologists, footnoting only Steven Weinberg, a physicist. However, even if they did in fact hold that metaphysical position, the apparatus of Darwinian explanation is surely not committed to it. Nagel just conflates the two questions throughout his book. There is absolutely nothing to prevent an anti-reductionist about consciousness, cognition and value from espousing Darwin's theory of the origin of species by mutation and natural selection — and I strongly suspect that *this* is the orthodox view (it is certainly my view). So far as I can see, even idealism and Cartesian dualism are consistent with Darwinism.

Nagel thinks that scientists interested in the origin of life approach the question with materialist assumptions: they seek a chemical explanation because they are diehard reductionists. But this is surely wrong: they look to chemistry simply because chemicals were the only stuff around on earth before early life (in the form of bacteria) arose. Later traits of organisms might be irreducible (being genuinely emergent), but the origin of life must have begun in non-life (unless we think life goes all the way back to the big bang). Oddly, Nagel says nothing about the actual theories that have been proposed, such as Cairn-Smith's crystal replication theory or the idea (well expounded in Nick Lane's *Life Ascending*) that the conditions in deep-sea thermal vents were conducive to the evolution of the first bacteria. He talks as if the laws of physics and chemistry alone must explain the origin of life on earth, instead of the peculiar local conditions that obtained on the early earth. He also makes the remarkable statement that in his judgment there has not been enough time during the course of evolution for genetic

variation and natural selection to produce the variety of organic forms we see today. He gives no argument or evidence for this and it seems completely implausible (here I would recommend Richard Dawkins's *The Ancestor's Tale* for a convincing account of how organic forms evolved over geological time). In general, Nagel relies on an overly schematic caricature of actual evolutionary theorizing in making his very sweeping claims, assuming that the course of evolution is held to be deducible from the laws of physics.

Although Nagel makes much play with the words 'material' and 'physical' he says almost nothing about how these words are to be understood. But there are considerable difficulties in providing any clear conception of what the associated doctrines are supposed to be, pointed out by many people from Hempel to Chomsky. Postulating gravity and later electromagnetic fields already went beyond the resources of classical mechanistic materialism, and one would need to know what all of future physics might contain to arrive at a sound characterization of what 'materialism' maintains. It is quite unsatisfactory to gesture at 'the spatiotemporal order' as the domain of the 'physical': that just assumes that the mental is outside the realm of the spatial, as well as leaving us unclear how matter is to be distinguished from space. So I do not really know what the doctrine of 'materialism', as Nagel understands it, is. He uses the word 'mechanistic' at one point, which adds some clarity; but then much of contemporary physics will not be 'materialist' by this criterion. Physics itself is quite heterogeneous in its theoretical machinery, since electromagnetic theory is not reducible to gravitational theory (I discuss this in *Basic Structures of Reality*).

Nagel is strangely blind to the evident irreducibility of standard Darwinian biology to physics. Evolutionary theory is couched in the following kinds of terms: predator, prey, parasite, symbiosis, function, fitness, adaptation, arms race, selfish gene, extended phenotype, eye, heart, sex, display, mimicry, and so on. How are these remotely 'reducible to physics'? The familiar point here is that the special sciences employ their distinctive concepts and categories that fail to map reductively onto the concepts and categories of physics. So we *already* know that reductionism is false well before we get to consciousness, reason and value. The middle ground between reductionism and theism, for which Nagel yearns, is quite robustly occupied by Darwinian biology itself—and this position is quite orthodox. Ironically, Nagel is taking reductionism much more seriously than he should.

One of his more striking claims is that any explanation of life or mind needs to show that these things are probable. He counts it against any historical theory that life should emerge 'by accident', as a matter of chance. In his view, matter must have an inherent tendency to produce life and mind. He remarks at one point that matter must be shown to have a 'bias towards the marvelous'. It is hard to know what to make of these uses of the notion of probability, but the following points should be noted. Must matter be credited with an inherent bias towards producing TV sets, since it came to assume

such a form? Is it not really just a cosmic 'accident' that TV sets came to be? Then why is it different with the platypus? Second, mutation is a chancy phenomenon, so how can it be that its results are not? Third, it is surely just chance that the dinosaurs were driven extinct because of a stray meteor, thus providing the opportunity for mammals to take over; so the existence of mammalian life as we have it is an accident. Why does the existence of mammals have to be somehow antecedently probable or implicit in matter as such? If not, then why is life as a whole? Fourth, as far as we can see life is an extreme rarity in the universe (as is mind), so how can it be 'probable' or built into matter from the start? The conditions on earth just *happen* to favor life, but matter elsewhere has no observable tendency to move in an organic direction. Oddly, Nagel ignores the cosmic rarity of life and mind, talking as if matter is perpetually on the brink of breaking into organic form.

Once Nagel leaves biology behind he gets into his stride and has some nice Nagelian discussions of consciousness, cognition, and value. He makes a good case that these things are problematic for evolutionary explanation, and problematic generally. But what strikes me is that he does not mention many other things that are generally regarded as problematic for Darwinian explanation and which are frequently discussed. Thus: sex, altruism, dreaming, syntax, reference, aesthetic sense, suicide, aging, bipedalism, fiction, modal thinking, mathematics, music, dance, depression. None of these is easy to explain, as Darwinians have long recognized, but no one thinks they undermine the overall correctness of Darwinian theory. In addition to standard adaptationist explanation, theorists try to see what can be done with spandrels and sexual selection. I would like to have seen Nagel explore this kind of theory a little more fully, especially when it comes to the development of advanced cognition (braininess might be like the peacock's tale). In general, his discussion of Darwinian theory is far too abstract and detached from the biological nitty-gritty.

Nagel's alternative to what he takes to be orthodox evolutionary thinking is what he calls 'natural teleology'. This part of his discussion left me particularly puzzled. Do we not already have natural teleology in biological theory — in the shape of the idea of function and what is good for the organism? Why does he think orthodox biology is non-teleological? More fundamentally, I do not really know what he means by this phrase, since it does not seem to include the idea of a goal or purpose. He seems to mean something like a tendency to organized complexity, but again many biologists believe that evolution naturally progresses to greater sophistication and complexity (thus eye design has improved over evolutionary time). At times he seems to mean some sort of anti-entropic principle, which makes me wonder if he thinks the law of entropy is an example of 'natural teleology', since it is temporally asymmetric and a general tendency of material systems. Also, what about extinction and evolutionary stasis? In the end I was baffled.

All in all I found this a frustrating book, in which the author seemed to be tilting at windmills and ignoring crucial distinctions. His grasp of evolutionary theory seemed sketchy and peculiar. There is much about the evolution of life and mind that we do not understand (and maybe never will), but this book seemed to me like a rather hysterical jab at something the author finds distasteful. Yes, we evolved from worms — get used to it.

Department of Philosophy
University of Miami
1252 Memorial Drive
Ashe Building
Coral Gables
FL 33124-4670
USA

COLIN MCGINN

doi:10.1093/mind/fzt059

