
Nagel's Untimely Idea

Is There More to Nature than Matter?

Few recent works of philosophy have provoked as much controversy as Thomas Nagel's *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False* (Oxford University Press, \$24.95, 130 pp.). Reviewing the book for the *New Statesman*, Simon Blackburn wrote, "If there were a philosophical Vatican, the book would be a good candidate for going on to the Index." The *Guardian* named it the Most Despised Science Book of 2012, while the evolutionary psychologist Steven Pinker took to Twitter to pronounce that a scathing review in the *Nation* had "exposed the shoddy reasoning of a once-great thinker." As for Nagel's defenders, some have been defensive (the title of one mostly favorable review: "Thomas Nagel is not crazy"); others have been defiant: the *New Republic's* Leon Wieseltier wrote, "I understand that nobody is going to burn Nagel's book or ban it. These inquisitors are just more professors. But he is being denounced not merely for being wrong. He is being denounced also for being heretical."

Why all the fuss? In *Mind and Cosmos*, Nagel argues that "the Neo-Darwinian conception of nature is almost certainly wrong" because it cannot explain the origin of conscious life, much less the human mind's ability to apprehend scientific truths or objective moral and aesthetic values. In the book's introduction, Nagel writes that the failure of neo-Darwinian theory to offer a satisfactory account of these things suggests that "principles of a different kind are also at work in the history of nature, principles of the growth of order that are in their logical form teleological rather than mechanistic." Nagel does not believe these principles are supernatural; as an atheist, he rejects every kind of supernatural explanation. But he also rejects the claim that the natural world is reducible to the material world. Consciousness, he believes, is no less natural than the material world, but is not itself material. Nagel does not propose a scientific alternative or supplement to Neo-Darwinian theory; instead, he presents the problems that such an alternative would have to solve. "Humans are addicted to the hope for a final reckoning, but intellectual humility requires that we resist the temptation to assume that tools of the kind we now have are in principle sufficient to understand the universe as a whole. Pointing out their limits is a philosophical task, whoever engages in it, rather than part of the internal pursuit of science—though we can hope that if the limits are recognized, that may eventually lead to the discovery of new forms of scientific understanding."

We asked three writers—the philosopher **Gary Gutting**, the biologist **Kenneth R. Miller**, and the physicist **Stephen M. Barr**—to assess Nagel's critique of "the current orthodoxy," and to describe how that critique fits into the larger discussion about what the natural sciences have yet to explain about ourselves and the world we observe.

—The Editors

Gary Gutting

Not surprisingly, most reviewers have approached Thomas Nagel's *Mind and Cosmos* in terms of philosophy of mind or philosophy of science. But the book is also of considerable interest from the standpoint of science and religion.

We're used to seeing religion and science as competitors in explaining the world. But until the middle of the nineteenth century—about two hundred years after the Scientific Revolution—modern science was the main source of evidence for a creator God. The precise regularities of physics and the complex mechanisms of biology seemed irrefutable proof of a designer. This grand alliance of science and religion collapsed only with Darwin's discovery that we can explain apparent design through a combination of chance variations and natural selection. The result was a "war" between science and religion, with religion continually retreating as science explained more and more aspects of our world with no reference to a divine will. The pseudo-science of "intelligent design" is the last gasp of an effort to return to the pre-Darwinian theological glory days.

The one "cloud" threatening the triumph of science has been the fact of consciousness. As Nagel points out, Galileo and Descartes excluded "everything mental from the scope of physical science" by making what seem to be qualitative features of matter (colors, aromas, tastes) features of the perceiving mind, not of the objects perceived. This gave the mathematical methods of the new science full scope in the objective, external world, but posed an enduring obstacle to a science of the mind. Scientists have established detailed correlations between the physical and the mental, to the point of showing that, as Nagel says, "our mental lives, including our subjective experiences...are...probably strictly dependent on physical events in our brains." The mind changes only if the brain changes. But even total correlation of mental states to brain states wouldn't show that the mind is, like the brain, a material thing completely describable by the physical sciences.

Neuroscientists often claim to have made great progress in providing a scientific account of consciousness. But they have never done anything more than specify more precisely the correlations between brain events and mental events. For their part, philosophers have repeatedly proposed ways to describe the mental in entirely physical terms. But, as Nagel notes, "such strategies...leave out just what was deliberately left out...by Descartes and Galileo in order to form the modern concept of the physical, namely, subjective appearances." The fact is we still don't know how to fit subjective experience into an entirely materialist world.

Nonetheless, most scientists and scientifically minded philosophers have been confident that we will eventually achieve a materialistic account of consciousness. At one time, Nagel himself agreed, although he suggested that such an account would involve an expanded conception of mind that

"will permit subjective points of view to have an objective physical character *in themselves*." We would, in other words, find a way to think of the mind as both entirely material and irreducibly subjective. But in *Mind and Cosmos* Nagel has changed his view and now thinks that integrating the mind into the world requires not a new conception of the mind but a new, nonmaterialistic conception of the world.

Other philosophers—most notably, David Chalmers—have also given up on materialism. Chalmers, however, opts for a version of dualism, positing units of consciousness (qualia) in addition to the material units (e.g., elementary particles) of physics. Nagel rejects dualism and instead proposes that we think of the world as made of a single stuff that somehow includes the seeds of both mind and matter. (Such a view, called "neutral monism," had been suggested by Bertrand Russell and by John Dewey.) Nagel's development of this idea is both sketchy and highly speculative. But one of his key suggestions is that the fundamental stuff of the world is directed toward goals that constrain the outcomes of evolution, moving it toward higher forms of organization, such as human consciousness.

Why does Nagel insist on a radical rejection of the materialist metaphysics rather than endorsing Chalmers's dualistic supplement to it? Because, Nagel maintains, materialist accounts rely on Darwinian evolution, which is not capable of explaining the origin of consciousness from matter. He agrees with the claim—often advanced by intelligent-design theorists—that there is not enough geological time for the processes of Darwinian evolution to produce the organisms that currently exist. But he offers no reason that laypeople should ignore the strong scientific consensus against such arguments—apart from the disdainful thought that the consensus persists only because "almost everyone in our secular culture has been browbeaten into regarding the reductive [Darwinian] research program as sacrosanct."

In any case, even if Darwinian evolution could in some sense explain the origin of consciousness, it could not, Nagel maintains, provide a *good* explanation. A good explanation, he says, must show that consciousness is not just a low-probability possibility that happened to occur but rather something to be expected from evolutionary development. Since evolution depends on random variations, there are many possibilities, each of them in its own right quite improbable, so that what actually happens was not to be *expected*. But why should such a situation exclude a good explanation of what occurs? There's a low probability for each of the possible results of spinning a roulette wheel. But when the ball settles on, say, twenty-two, we rightly explain this by saying that this is a result that will occur every so often. Nagel doesn't reject (or even discuss) such examples, but he apparently thinks that consciousness is too "remarkable" a feature to be explained in this way. Why, however, he doesn't say.

The second half of *Mind and Cosmos* offers much better developed and more interesting arguments that our knowledge of objective truths—logical, factual, and moral—are undermined if our minds are the results of the vagaries of random

mutations and natural selection. Here Nagel lends his powerful voice to a case Alvin Plantinga and a few others have been trying to make for several years. The core claim is this: Evolution can explain our having certain beliefs only because they have survival value, but a belief can have survival value even if it is false. For example, our belief that $2 + 2 = 4$ would have survival value even if in fact $2 + 2$ equaled 3.9999999, since it would be an adequate approximation for any practical purpose. Similarly, a widespread belief that murder is objectively wrong would help preserve the human species even if it were not in fact true. This argument has been strongly contested, and we still have a lot to learn from the ongoing discussion.

Despite its argumentative failings (thoroughly canvassed by early reviewers), *Mind and Cosmos* is an important contribution to our thinking about science and religion. Nagel is, at points, sympathetic to the intelligent-design community and, especially, to Plantinga's vigorous defense of theism. But Nagel's own view is secular, indeed atheistic. He rejects materialism (the idea that there is nothing but matter) but not naturalism (the idea that there are no supernatural forces in the universe). Believers may welcome his aid as a critic of materialism, but his work will be most valuable to agnostics and atheists seeking intellectual depth, subtlety, and flexibility not available in the crude materialism of popular unbelief. Even though the brief book is short on rigorous detail, it outlines a potentially fruitful picture of what a metaphysics of atheism might be.

Nagel's book also suggests the possibility of a turn to—of all things—idealism within analytic philosophy. With the demise of positivism, much analytic work, especially in epistemology and ethics, has centered on Kant. But there has been little movement, at least in the fundamental domain of metaphysics, toward fulfilling Wilfrid Sellars's prophetic aphorism: When Kant appears, can Hegel be far behind? Nagel is no full-bore Hegelian, but he does allow that he is "an objective idealist in the tradition of Plato and perhaps also...of Schelling and Hegel." He rejects the subjective idealism that regards the so-called external world as mere appearance, but, like Hegelians, sees mind as implicit in all reality. It is not surprising that he shows sympathy for another glimmering of idealism in the analytic world, Galen Strawson's panpsychism, which sees all matter as at least minimally conscious. Nagel also speaks with respect of an intriguing quasi-idealistic path-not-taken by analytic philosophy—Alfred North Whitehead's process metaphysics.

An atheism that is antimaterialist, even idealistic, and committed to teleology and objective values—right or wrong, it's a refreshing change in our stale battle between science and religion!

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Kenneth R. Miller

Put "Darwinian" and "false" on the cover of a book, and you're bound to attract plenty of attention. Whether he planned it that way or not, that's exactly what's happened with Thomas Nagel's *Mind and Cosmos*. After seeing the book's subtitle—with its claim that the "materialist neo-Darwinian conception of nature is almost certainly false"—one would expect a scientific broadside against evolution to be packed into the pages of this slim volume. But it's not there. In fact, the big surprise in *Mind and Cosmos* is how little it offers in the way of science.

To be sure, Nagel is skeptical of the evolutionary process. He says it's "prima facie highly improbable that life as we know it is the result of a sequence of physical accidents together with the mechanism of natural selection." But he does nothing to support that intuitive skepticism. He puts forward no statistical argument, no critique of the fossil record, and no discussion of molecular evolution, genetic novelty, or biochemical complexity. His subtitle notwithstanding, Nagel leaves the vast inventory of evidence for evolution untouched. Indeed, those seeking a full-throated takedown of Charles Darwin will have to look elsewhere, as Nagel himself admits, writing that he proposes merely "a revision of the Darwinian picture rather than an outright denial of it."

Why, then, does he claim that the neo-Darwinian view is "false"? As the reader quickly discovers, Nagel's problem isn't so much with evolution as with neuroscience. To put it simply, his big complaint is that the human brain has not yet succeeded in figuring itself out. Sorry, but this is not news.

While the neuroscience research community may welcome the assertion that there are still fundamental problems for it to solve, Nagel regards this as a fatal critique of the materialist program in biology. The premise of that program, he claims, is that all of biology is ultimately reducible to chemistry, which is reducible to physics, which deals with matter and energy and nothing more. As an experimental biologist, I have to admit that's a pretty fair description of how the science has operated for the past hundred years or so. And I'd say it seems to be working pretty well, at least so far. But Nagel sees an obstacle—a big one—to the ultimate triumph of materialist science: consciousness.

Nagel starts with the obvious fact that consciousness has, as yet, no detailed material explanation. Fair enough. But then he asserts that it will *never* be explained in terms of physics and chemistry. This matters because "if physics and chemistry cannot fully account for life and consciousness, how will their immense body of truth be combined with other elements in an expanded conception of the natural order that can accommodate those things?" So, why is the theory of evolution also in trouble? Because, as a theory of biological origins, it must offer some account for the emergence of mind and consciousness. And, "Since a purely

materialist explanation cannot do this, the materialist version of evolutionary theory cannot be the whole truth.”

While most neuroscientists would agree that we have not achieved anything close to a mechanistic explanation of consciousness, the assertion that such an explanation *cannot* be achieved is striking. Nagel supports this claim not with empirical evidence, but with philosophical arguments about the nature of cognition, drawn ultimately from the mind-body dualism of Descartes. Echoing Descartes, Nagel argues that “since we can clearly conceive of the mind existing without the physical body and vice versa, they can’t be one thing.” The experience of a sensation, like the taste of sugar, cannot be identical to the physical brain state involved in tasting sugar. Therefore the conscious reality of what sugar tastes like cannot be fully accounted for by the physics and chemistry of the organ we call the brain.

Nagel also argues at some length for a moral realism that is independent of evolutionary accounts of the emergence of moral judgment. He recognizes, as have others, that if our moral sense is entirely the product of evolutionary forces related to reproductive success, then it becomes difficult to argue that we are equipped to discover and evaluate genuine truths that do not depend on our own subjective views.

These are fascinating arguments. While making clear that he holds no brief for theism, Nagel nonetheless appreciates the believer’s intuition that there must be something above and beyond the order of nature itself. This is a sentiment I gladly share. But Nagel, an atheist, goes further, observing that “the existence of consciousness seems to imply...that the natural order is far less austere than it would be if physics and chemistry accounted for everything.” Less austere? One has to ask, how does he know that? While some of the more dreadful undergraduate courses in physics and chemistry might indeed seem austere, nature itself is filled with extravagant beauty and creativity. And that beauty is built, as far as we can tell, on the very physics and chemistry that Nagel disparages. The problem of consciousness notwithstanding, Nagel’s bold arguments about the nature of the physical universe are clearly grounded more in personal preference than in the realism he seeks to defend.

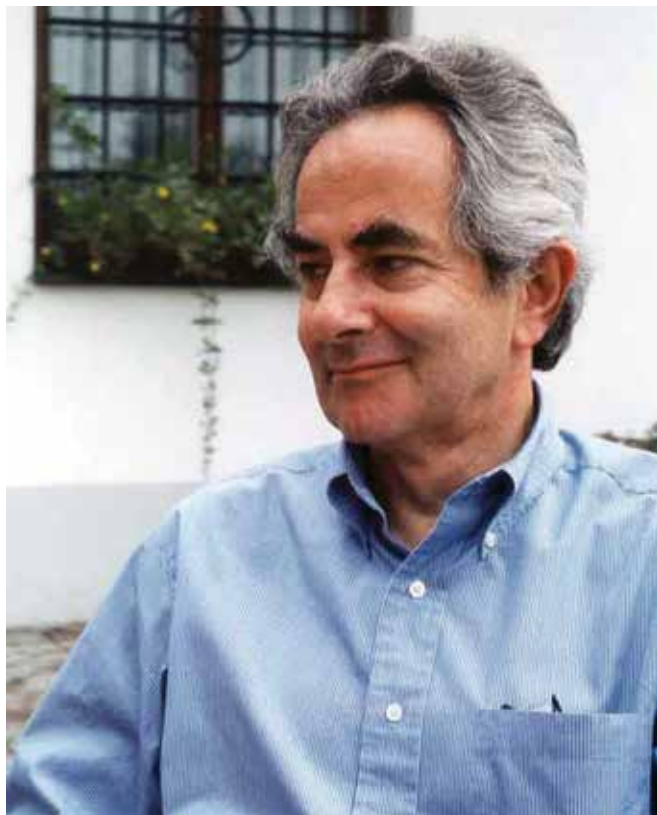
Despite that criticism, I would urge my scientific colleagues to take his arguments seriously, and especially to consider the central nature of the problem of consciousness. Referring to our own species, Carl Sagan once wrote that “we are a way for the cosmos to know itself,” and so we are. In Nagel’s words, “The process seems to be one of the universe gradually waking up.” If we are creatures truly formed from the cosmic dust of physics and chemistry, the question of how we have come to know ourselves and the universe around us demands our attention more than ever.

Frankly, I confess a certain admiration for Nagel’s boldness. As a philosopher, he looks at the research community from the outside. While others may see this as a problem, there have been times in the history of science where

someone standing outside a field was able to see its difficulties far more clearly than those working within it. One of those times came in the 1940s when physicist Erwin Schrödinger cobbled a series of lectures together into a book with the title *What Is Life?* Many scientists, including James D. Watson of double-helix fame, have credited Schrödinger’s book with inspiring them to think critically about the chemical and structural nature of the gene. It’s instructive that Schrödinger himself once made a claim remarkably similar to Nagel’s. Specifically, he argued that our then-current understanding of physics was incapable of explaining the chemical nature of the gene. Science, he felt, had to take a leap forward to accommodate the challenge of heredity by discovering “other laws

of physics, hitherto unknown.” Nagel makes a similar assertion, telling us that “the tendency for life to form may be a basic feature of the natural order, not explained by the nonteleological laws of physics and chemistry.”

Schrödinger, however, did not claim that our current understanding of those material laws was “almost certainly false.” Nor did he indict “materialist science” as being unable to solve the problem of the gene. Rather, he wrote that those “other laws” of physics, “once they have been revealed, will form just as integral a part of this science as the former.” And so they have. Discovering the double helix and the molecular nature of the gene showed pre-1950s physics and



Thomas Nagel

chemistry to be not false but merely incomplete in their ability to explain living matter. Schrödinger's challenge to biology was met by new discoveries that, far from rejecting materialist science, actually validated its power and extended its reach. The same will be true, I predict, with respect to the problem of consciousness.

Nagel's great mistake is that he seems to regard naturalistic science as hopelessly stymied by the problem of consciousness. From such a viewpoint, any unsolved problem becomes fatal to a science that claims to have everything figured out. But no science, even "materialist neo-Darwinian" biology, can actually make the claim of finality. Rather, all science is necessarily incomplete, and recognizing that fact with respect to questions like consciousness does not mean that the great achievements of neuroscience and evolution are "false." In fact, it tells us something quite different. It tells us that we have only now reached a level of understanding from which we can begin to address exactly the questions Nagel considers off limits to materialists. Far from being at a dead end, we're at a point where things are just getting interesting, and the material sciences Nagel scorns are the very tools that will show us the way ahead.

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Stephen M. Barr

Scientific materialism is perhaps the main intellectual rival to religion today, and one that recently seems to have grown in popularity. It is therefore a momentous occasion when a forceful attack on materialism is made by a leading philosopher who is himself an avowed atheist.

Scientific materialism claims that everything that exists and everything that happens is ultimately reducible to the behavior of particles, fields, energy, forces, and the other kinds of entities posited by theoretical physics. Those who embrace this view are encouraged to do so by the enormous explanatory success of modern science. That success has been based on a form of reductionism that explains physical systems by analyzing them in terms of their fundamental constituents and how those constituents are organized and interact with one another. Wherever such analysis has been carried out—at least for inanimate matter—the resulting explanations seem complete. Most physicists (myself included) think it highly implausible that there is anything about the nature or properties of a chunk of iron, say, or a drop of water, or a star, or an atom that is not explicable in this way. This kind of reductionism has been extended with increasing success to biology. Molecular biology and related disciplines are giving us an ever greater and more detailed understanding of the processes of life.

The big question, of course, is whether *minds* can be understood completely in this way. Thomas Nagel contends that they cannot be and that materialism must therefore be false. His main argument is that materialism cannot account for three aspects of mind: consciousness, cognition (specifically, certain features of human rationality), and the human capacity to apprehend objective values. He argues, moreover, that even if materialism could explain how minds *can* exist in a purely physical world, it has no plausible account of how and why they did *in fact* come to exist. Darwinian evolution, being a purely physical theory, is not enough. To use Nagel's language, materialism provides neither a "constitutive" nor a "historical" account of mental phenomena. What's more, materialism leaves unexplained the remarkable fact that the world is intelligible. As Nagel puts it, not only is "nature such as to give rise to conscious beings with minds...it is such as to be comprehensible to those minds." On the basis of all these considerations, he concludes that mind must be recognized as a feature of the natural world just as fundamental as matter.

Though I find all of Nagel's antimaterialist arguments cogent, I will confine my comments to the argument that consciousness is not reducible to physics. As a physicist, this conclusion seems to me obvious and to follow directly from the very nature of physical science and the way it explains things. According to physics, every physical system is completely characterized—indeed, *defined*—by a set of "variables," which mathematically describe what its elementary constituents are doing and whose evolution though time is governed by a set of mathematical rules and equations. (The transition from classical to quantum physics in the twentieth century did not change this basic framework, it only made the system of rules and equations more subtle.)

Of course, one does not need to keep track of all the variables of a physical system in order to know many interesting and important things about it—otherwise it would be impossible for human beings to do physics. But if one *did* know what all the variables were doing and the laws governing them, one could in principle derive everything there was to know about the system's properties and behavior—if the system is just physical. This derivation could be carried out using only the rules of mathematics and logic. That is what physicists generally believe, and for very good reason: in the purely physical realm—for example, the realm of inanimate matter—nothing has ever been found that gives grounds for doubting it.

In any event, whether you believe in this kind of reduction or not, it is the only kind that is done in physics. And so, if the physical sciences provide any warrant for believing in reductionism, it is only this kind of reductionism. It is clear, however, that *this* kind cannot be extended to consciousness. Even if one knew all the variables of a physical system, their values at one time or at all times, and the equations governing them, there would be no way to derive from that information anything about whether the system in question

was conscious, was feeling anything, or was having subjective experiences of any sort.

Of course, we sometimes infer from its physically observable behavior that a being has feelings. When my dog begs for a strip of bacon, I know it's because he enjoys the taste. But that conclusion is based on an analogy between the dog's reactions and mine, not on a mathematical or logical derivation from physical facts. Nor could it be based on such a derivation, for such things as enjoyment or taste are not quantities, and physics deals only with quantities—quantities that appear in equations and quantities that are measured.

While Nagel rejects “psychophysical reductionism,” and believes mind to be as fundamental as matter, he rejects any form of mind-matter dualism. “Outright dualism,” he says, “would abandon the hope for an integrated explanation...and would imply that biology has no responsibility at all for the existence of minds.” Instead, matter and mind must be seen as parts of “a single natural order that unifies everything on the basis of a set of common elements and principles.” In his view, the evidence “favors some form of neutral monism”—the idea that there is really just one basic stuff in nature, which has both physical and mental aspects.

Nagel may be right to reject dualism, but his reasons for doing so seem weak to me. It is not clear why dualism would preclude an “integrated explanation” of the physical and mental. After all, even *within* the physical realm there can be distinct entities, quite irreducible to each other, that are embraced by a single theory that “unifies [them] on the basis of a set of common elements and principles.” Physics provides many instances of this. For example, electromagnetic fields and electrically charged particles are two distinct kinds of entity, whose relationship to each other is explained by an integrated theory called “quantum electrodynamics.” Furthermore, in this theory the charged particles have some “responsibility” for the existence of the electromagnetic fields despite being utterly distinct from them. It is not clear why, in an analogous way, matter organized into biological structures couldn't be responsible in some degree for the existence of minds, despite being ontologically distinct from them.

Even if one knew all the variables of a physical system and the equations governing them, there would be no way to derive from that information anything about whether the system was conscious, was feeling anything, or was having subjective experiences of any sort.

Finally, there is the question of Nagel's atheism. Nagel admits that theism has an advantage over materialism in that it at least “admits the reality of more of what is so evidently the case”—in particular the reality of mind, purpose, and value. He also admits that theism has some explanatory power. It might, for instance, be able to explain why the universe is such as to bring forth minds, and why it would be intelligible to those minds. (That might be part of God's intention in creating the universe.) But Nagel objects to theism on the grounds that merely positing the existence of God does not provide the kind of explanation

he is seeking: an explanation of how matter and mind fit together within a single unified natural order. And, of course, he is right that it doesn't. Knowing that God is the author of the natural order does not, by itself, tell one very much about how the natural order works.

Of course, if one could know completely the mind of God (which is impossible without being God), one would understand what he understands, including everything there is to understand about the natural order. But the theist is not in that position, obviously. To say that God is the ultimate explanation of everything is not to say that *theism* is the explanation of everything. It doesn't have to be such an explanation, however, in order to be a rational and well-founded belief. It only has to explain more than the alternatives. And a

key point, which Nagel at times seems to forget, is that natural explanation and theism are *not* alternatives to each other. The idea that all the various aspects and components of the natural order fit together in some internally coherent way and the idea that some mind (God's) conceived the natural order in the first place can be seen *themselves* to fit together in a coherent way.

We ought to be grateful that Nagel has been able to see so much “more of what is so evidently the case” than most contemporary philosophers, even if that does not include the existence of God. ■

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