Reflective Pieces

with Arnold O. Benz, "Astrophysics and Creation: Perceiving the Universe through Science and Participation"; Whitley Kaufman, "Poetic Naturalism: Sean Carroll, Science, and Moral Objectivity"; and Doren Recker, "Faith, Belief, and the Compatibility of Religion and Science."

POETIC NATURALISM: SEAN CARROLL, SCIENCE, AND MORAL OBJECTIVITY

by Whitley Kaufman

Abstract. Physicist Sean Carroll has developed a new theory of the fundamental nature of reality, which he calls "Poetic Naturalism," with the stated goal of developing a theory of what is real that is consistent with the findings of natural science. Carroll claims to prove that morality cannot be seen as objectively true. This essay argues that Carroll's conclusion is not convincing; there is no good reason to reject moral objectivity within a purely naturalistic worldview.

Keywords: ethics; naturalism; science and morality

Has science undermined belief in moral objectivity, that is, the belief that morality is objectively true and binding on us independent of our desires? Though many (and in my experience most) moral philosophers continue to believe in moral objectivism (also known as moral realism), the idea that moral rules could be part of the basic furniture of the universe has come under increasing attack as inconsistent with the dominant naturalist worldview. Though there is wide disagreement as to the precise meaning of the term "naturalism," the general sense is that it excludes belief in supernatural entities or any entities inconsistent with the scientific picture of the world. While that picture rules out the traditional idea of ethics as being the product of a divine command (for example, Moses receiving the Ten Commandments on Mount Sinai), it is far less clear whether a more secular, philosophical account of objective ethics is inconsistent with naturalism. In this essay I examine one version of that argument: physicist

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Sean Carroll's new theory of "Poetic Naturalism," which claims that moral objectivity, even in its secular form, is irreconcilable with the findings of science and must be abandoned (Carroll 2016).

Why focus on this one particular metaphysical theory, the work of a physicist not a philosopher? The answer is that this position—that a science-based naturalism rules out moral objectivity—is extremely influential among both scientists and philosophers. Thus physicist Steven Weinberg insists that once we known the "final laws of nature," we will "find no standards of value or morality" (Weinberg 1993, 250). Philosopher Alexander Rosenberg declares that "In a world where physics fixes all the facts, it's hard to see how there could be room for moral facts" (Rosenberg 2011, 94–95). Philosopher Brian Leiter insists that in a naturalist ontology "we won't find . . . any moral facts" because "these play no role in any scientific enterprise with the 'predict and control' bona fides of successful sciences" (Leiter, quoted in Shook and Kurtz 2009, 197). Biologist Jerry Coyne asserts that, since "'ought' can't be derived from 'is,'" and since science deals only in the 'is,' then "there are no objective moral truths," and "morality isn't a way of knowing" (Coyne 2015, 190).

Carroll's position is thus an expression of a view that has become mainstream among scientists and naturalistic philosophers. Indeed, if anything Carroll is more liberal in his ontology than most naturalists, avoiding the strict reductionist view that only fundamental particles are truly real. It is thus all the more important to see why even such a broad ontology still, according to Carroll, cannot admit the possibility of objective moral truth. This essay attempts to show, using Carroll's theory as an example, where the naturalists go wrong in ruling out *a priori* the possibility of moral objectivity. I will attempt to demonstrate that naturalism, properly interpreted, supports rather than undermine the idea that morality is a legitimate form of knowledge.

What Is "Poetic Naturalism"?

Carroll's ambitious project is to construct a theory of the "fundamental nature of reality" (Carroll 2016, title of Chapter One). In particular, his question is one of ontology: what sorts of things are there in the world? The classic problem in ontology since the rise of the sciences has been to say what the relation is between the fundamental particles that are the subject matter of physics, and the familiar objects in the world including trees, cars, planets, minds, persons, and so on. In what sense can these higher level entities be said to be real, versus merely collections of particles? But Carroll's real interest is the ontological status of one particular kind of entity: value, purpose, and meaning—including moral values, aesthetic values, and the sense of purpose and meaning that people have long sought

in religion, among other places. In what sense can values and meaning be said to be real, in an age when science rather than religion dictates our metaphysics?[1] And what could be the relation between such strange entities as values and the fundamental particles?

In constructing an ontology, Carroll recognizes, there is a wide range of positions one could take. At one extreme is what he calls strong reductionism: the only thing that is real is the fundamental entities as discovered by physics (whatever those turn out to be); everything else is an illusion, a mere collection or arrangement of those fundamental entities (2016, 110). Though it might seem bizarre to say that trees, planets, and people are illusions, it is a position that still attracts a surprising amount of interest, in part because it makes one's ontology so much simpler.[2] However, Carroll's theory is in line with a clear trend among philosophers away from reductionism and towards pluralism given the notorious failure of the reductionist project in the history of science (see, e.g., Dupre 1993; Horst 2007). Thus Carroll allows that reality has many distinct logical "levels" and that each of them can be taken as real (2016, 4). He adopts the usual term of "emergence" to distinguish the higher levels versus the lower; fundamental particles (whatever they turn out to be) are fundamental; higher level entities such as molecules, trees, and planets are emergent entities, but real all the same. The ontology at the other extreme, Carroll explains, is the idea of "strong emergence" (110). On this view, all the different levels of reality (or "stories," as he likes to call them, in the sense of tales or narratives) are equally real, fully autonomous, and even incompatible with each other[3] (110). On this view, moral and mental properties are "as objective and fundamental as the physical world" (112)—a position that Carroll rejects, for reasons I will examine below.

Carroll's own view, which he dubs "poetic naturalism," is intended as a middle ground between these extremes. The "naturalism" part refers to his insistence that "there is only one unified, physical world": the "poetic" part allows that there are "many useful ways of talking about it" (2016, 112). Thus on his view there is only one fundamental underlying physical reality (though, he adds, we have no idea what this is yet!) (111–12). However, there are two broad categories for constructing descriptions of that reality. First are the sciences: physics, biology, psychology.[4] The subject matters of these sciences are real, factual, and objective, but they are not fundamental. They count as "emergent realities." Finally, there is the realm of values, purposes, and meanings. These entities Carroll describes as real and emergent, yet as constructed and subjective (111–12). So what we have is a tripartite continuum of realities: the fundamental level, the emergent objective level, and the emergent subjective level.[5] (However, whereas most philosophers would use the terms "levels," Carroll mostly describes these categories as "ways of talking" or "ways of thinking" about reality, though it is not entirely clear why he prefers this subjectivist vocabulary.)

Poetic naturalism claims to avoid reductionism by granting that higher level entities are perfectly "real," even if they are not fundamental elements of reality. Even values and purposes, which are twice removed from being fundamental, being wholly invented by us, still count as real. Carroll's view is not of course meant to grant reality to everything; the very point of inquiry is to distinguish truth from falsity, the real from the unreal. Cars, trees, electrons are real; the Loch Ness Monster, unicorns, and the luminiferous ether are not—as well as pretty much all of religious belief. Poetic naturalism also provides us with a criterion for identifying what is real: whatever is "useful" (so long as it is consistent with other "ways of talking"). Thus "many concepts that are part of non-fundamental ways we have of talking about the world—useful ideas describing higher-level, macroscopic reality—deserve to be called 'real'"(Carroll 2016, 19).

Carroll's project of constructing an entire metaphysics is ambitious enough already (he himself refers to the project as "hugely grandiose" (2016, 13)). But there is even more to it. Poetic Naturalism is not merely a form of metaphysical inquiry, but perhaps even more importantly a form of "existential therapy" (3). Carroll thinks that our culture has not fully absorbed the meaning of the scientific revolution; we are still stuck in the traditional, pre-scientific outlook (that is, religious belief, though Carroll generally avoids saying so explicitly). In the traditional view, human existence has a cosmic purpose; life is meaningful, and humans have a special place in the cosmos, with built-in moral purposes for us. Carroll rejects this view, but again seeks a middle ground. Rather than adopt the nihilist view that life is meaningless and absurd (as do many naturalists), he suggests that whereas the universe itself provides no meaning, value, or purpose for us, we are capable of creating our own: "we are thinking and feeling people who bring meaning into existence by the way we live our lives" (3). This is, he thinks, the ultimate lesson of naturalism: "Purpose and meaning in life arise through fundamentally human acts of creation, rather than being derived from anything outside ourselves" (9). This issue is at the heart of Carroll's theory; it is, he says, "the hardest problem of all": "how to construct meaning and values in a cosmos without transcendent purpose" (5).

Moral Subjectivism versus Moral Objectivism

To recapitulate: Carroll posits a tripartite model of reality, divided into (1) fundamental reality, (2) emergent objective reality, and (3) emergent subjective reality. This last category involves such things as values and purposes, which are (he says) created by us rather than being part of the "furniture" of the universe. They come from within us, and are not independent of us. They are in some sense real, but a created or invented reality, not an objective one. Hence, Carroll thinks, we can confidently

resolve the age-old philosophical debate about the status of moral values by definitely establishing that moral values are subjective, not objective. To be sure, the term "subjective" is vague, but Carroll seems to mean that it is up to us to decide what moral principles to adopt; we cannot expect help by looking outside us, either to a deity or to investigation of the world.

For the moral philosopher, to say that morality is "objective" is to say that it is independent of us (see, e.g., Huemer 2005, 2–3). However, this sort of independence need not be taken in an ontological sense, as meaning there are moral rules "out there" to be discovered, let alone that these rules are dictated by a deity (e.g., Putnam 2004). Rather, the question is whether we are constrained in our moral choices by the independent validity of certain moral principles. That is, when we choose between kindness and cruelty, should we say that either choice is equally legitimate or that there is a right and a wrong choice? The former position is the subjectivist one; the latter the objectivist one. Put another way, in a trivial sense *of course* morality is a product of human choice; the real issue is whether there are better versus worse choices. To say that humans invent morality in the strong sense is to say there is no objective sense in which any choice is better than any other; to choose cruelty over kindness is not in any sense wrong or even unfortunate, any more than to choose vanilla ice cream over chocolate. In this respect, the useful point of comparison is mathematics. We regard mathematical principles as objectively true and hence independent of us, even though it is very difficult to say what "independent" means: do they exist in a separate Platonic real to which we somehow have access? Moral philosophers have frequently noted the close parallel between the two disciplines, and claimed that morality can be said to be objective in the same sense that mathematics is: that is, it is not entirely up to us, but a product of rational inquiry.[6]

Moral philosophers have long recognized a number of strong arguments in favor of moral objectivism. First, it is undeniable that commonsense morality assumes moral objectivism. We do not believe that cruelty is just as valid a moral choice as kindness. We teach our children ethics as real and objective; our legal system is based on objective moral principles (e.g., that rape, murder, and torture are objective moral wrongs); even scientists are governed by an objective code of ethics, including the ethics of experimenting on human subjects, the ethics of reporting data honesty and not falsifying it, the ethics of giving credit to the original source of a new idea, and so on. Further, there is the remarkable fact of the convergence of ethical beliefs across cultures, and the universal agreement on the basic ethical principles. In addition, the fact that we debate about ethics and argue for and against certain position gives evidence that there is a rational basis for ethics, that it is not merely arbitrary choice (else there would be no point to debating). For these and other reasons, most contemporary moral philosophers, on fully secular and rational grounds, have rejected moral

subjectivism or relativism.[7] We choose our ethical principles, but there are better and worse choices. Carroll's argument for a subjectivist ethics arrives from outside the field of ethics, from physics and metaphysics. So the question for us is just what are his metaphysical arguments against moral objectivism, and are they convincing?

Carroll's Usefulness Criterion

Recall that Carroll provides us a criterion for determining whether something is real: whether it is a useful "way of talking." Now it would seem hard to think of a form of discourse more useful or central to human life than that of morality. It is the foundation of social relations, societal organization, criminal justice, international relations, and interpersonal conduct. It is practically impossible to imagine life without it (though philosophers have tried, through imagining the "state of nature" as a war of all against all, in Thomas Hobbes's famous phrase). Of course the term "useful" is distressingly vague, and its application is even more confusing when it comes to *normative* concepts—shoulds and oughts and musts, rather than descriptive concepts that science deals with.[8] Still, pragmatist philosophers have long addressed this question, defining usefulness in a broader sense as that which promotes human flourishing. By this standard, morality seems as useful as any field of knowledge—and far more useful than many fields of science, for example, paleobotany or marine archeology.

Thus Carroll concedes that values are real by the standards of his own theory. The problem is that this third-tier sort of reality is so attenuated that it seems almost disingenuous to call it real at all. To say that values are subjective and invented by us would be, for most philosophers, evidence that morality is not real at all. After all, cartoon characters are created by us, yet that does not make them real in any meaningful sense. It does not help when Carroll insists that moral rules are real by comparing them to the rules of basketball (2016, 416)—the epitome of arbitrary, purely conventional rules. It thus seems undeniable that morality is as useful as any branch of human knowledge or practice, and thus it is surprising that Carroll's theory relegates them to being no more real than fictional entities. As we will see, this is because it is not usefulness that is doing the work here, but another criterion in Carroll's theory.

The fact that morality is an emergent rather than a "fundamental" reality seems of little import, since being "emergent" places morality in the same category as virtually every other real entity in the world, with the sole exception of "fundamental" entities, whatever they may be. Thus values are no less real than planets, cells, atoms, electrons, organisms, and so forth. Carroll himself seems uncertain just how real an "emergent" entity is, a point to which I return below. But for the moment, we can say that calling

moral principles emergent realities, by the standards of Carroll's theory, is not something that a moral philosopher would object to.[9]

So the issue at stake comes down to why Carroll thinks that this particular type of emergent entity—value, purpose, meaning—is so different that it should be counted as subjective rather than objective, as invented rather than discovered in the world. Carroll has two arguments for this distinction, to which I now turn.

The Normativity Argument for Moral Subjectivism

Carroll's first argument against moral objectivism is that, while morality is eminently useful and hence can be considered a real, emergent entity, if taken as objective it does not fit into the scientific picture of the world. That is, usefulness is only one criterion of reality; the other is consistency with science. But science is a descriptive enterprise, while morality is a normative or prescriptive one: "the search for meaning is not another kind of science. In science we want to describe the world as efficiently and accurately as possible. The quest for a good life isn't like that; it's about evaluating the world, passing judgment on the way things are and could be" (Carroll 2016, 389). Similarly: "The move from description to prescription, from saying what happens to passing judgment on what should happen, is a creative one, a fundamentally human act. The world is just the world, unfolding according to the patterns of nature, free of any judgmental attributes. The world exists; beauty and goodness are things that we bring to it" (21). This argument is not new; it is the classic case against any sort of values, on the grounds that science has uncovered the fact that the world consists of physical entities and there is no place for norms or values.[10]

However influential this argument is, it is unconvincing. From the fact that science is the study of material entities, it does not follow that material entities are all there is in the world. Thus it has long been noted that the fact that the natural sciences have chosen on *methodological* grounds to look only at the descriptive aspects of reality does not license the *metaphysical* assumption that values are somehow less real. Indeed, the very idea of "emergence," as Carroll recognizes, entails the appearance at higher levels of novel properties that do not appear at the fundamental levels and that could not even have been predicted based on one's knowledge of the lower levels—the property of *life*, for example, does not appear at the level of fundamental particles. To be sure, no one thinks that values "emerge" from fundamental particles; values, whatever they are, are not made of physical stuff. (Though agents that are capable of pursuing values do emerge from physical stuff). But unless one is a reductionist, why should we believe that the world is made only of physical stuff? One can perfectly well be a naturalist without being a physicalist; there is just one world, but not everything in it is made of "underlying physical reality."

Now it would be a legitimate objection if belief in objective morality were inconsistent with physics, in the clear sense of contradicting basic laws of physics. Many religious beliefs, for example, have been rejected on just this ground. But moral objectivity does not obviously violate any known laws of physics; it does not require that one suspend the law of gravity or any other law. Even belief in free will, long associated with belief in moral objectivity, need not violate physical laws.[11] To say that morality is inconsistent with science requires far more than to say that values do not appear at the level of physics; that argument simply ignores the very idea of emergence.

The belief in objective values is, as philosophers have long observed, no more problematic or unscientific than the belief in objective mathematical principles, which are also not made of physical stuff. Carroll largely avoids the issue of the ontological status of logic or mathematics, asserting opaquely that math does not provide us with "facts" but only with "implications of various assumptions" (2016, 132).[12] But logic and mathematics are normative disciplines, providing objectively binding rules of thought. Indeed, Carroll himself takes mathematics and logic as normatively binding, as evidenced by his pervasive use of Bayes' theorem as a model of proper reasoning.[13] This creates a dilemma for Carroll's theory. If math and logic constitute objective norms, then the argument that objective norms are inconsistent with science collapses. Alternatively, one could hold that math and logic are subjective and created by us—an unlikely conclusion (and one that makes morality no less valid than mathematics or logic). Most mathematicians, it appears, believe that mathematics is discovered, not invented.[14] When the Indiana legislature notoriously legislated the value of pi as 3.2, that did not make it so. Again, to be an objectivist about mathematical or moral norms one need not assume a Platonist ontology, as if mathematics or morality must correspond to something "out there"; normative objectivity, as Hilary Putnam has cogently argued, need not involve correspondence to an external reality (Putnam 2004).

If so, it cannot be *normativity* that is the reason for rejecting moral objectivism. This is because normativity is not confined to ethics and aesthetics, but is essential to rationality, mathematics, and science itself. As has long been recognized, science itself is an essentially normative enterprise, a purposive quest for truth, imposing rules and procedures on its participants (the so-called scientific method). As Alfred North Whitehead once wryly observed, "Scientists animated by the purpose of proving that they are purposeless constitute an interesting subject for study" (Whitehead [1929] 1967, 16). If all normativity is merely subjective, as Carroll's argument entails, then the norms of science are equally subjective, and hence science itself is just as much "invented" by us as ethics. Indeed, Carroll's entire book is a project in normative argument, an argument that we *ought* to accept this new science-based metaphysics. Just to take one small

example, he writes: "The raw materials of life are given to us by the natural world, *and we must work* to understand them and accept the consequences" (Carroll 2016, 21; emphasis added). Rational inquiry cannot proceed without norms of inquiry. So the objection to moral objectivity cannot simply be that it is a normative discipline. Let us turn to Carroll's second objection to moral realism.

The Cognitive Bias Objection to Moral Objectivity

Carroll makes a second and very different sort of objection to moral objectivity, one that seems to reflect his real underlying concern about belief in objective values. He claims that our belief in moral objectivity is the product of a particular "cognitive bias": we would like for it to be true, and so we are prone to see objectivity where there is none (2016, 402). What is the nature of this bias? One source of the bias may be, he suggests, that we want to fight against evil people—"Hitler, the Taliban, or schoolyard bullies"— but if there is no objective morality, we cannot claim to be justified in doing so (402). But it seems that for Carroll the more important source of this bias is one of consolation: the desire to believe that objective morality and meaning is built into the structure of the universe, that our existence really matters, that we are not just a collection of particles in an uncaring universe. This is a pervasive theme in his book, indeed the stated motivation for writing the book (e.g., 2, 11, 49, 220, 388). Belief in objective morality, he claims, is motivated by our inability to admit that we really don't matter in the larger scheme of things.

This method of argument is notoriously problematic. Rather than providing a rational argument that morality cannot be objective, Carroll gives us a causal, psychological explanation of how we have been deluded into believing what we do. Such an argument style was common among Freudians and Marxists in the twentieth century (thankfully, it is no longer so). It has been widely criticized for bypassing the process of rational debate; rather than address directly the arguments and evidence, it assumes that the beliefs of one's opponent are not based on reason but can be explained psychologically. Thus it is notable that Carroll in his book largely ignores the vast literature in moral philosophy on the topic of moral objectivity, dismissing it apparently because it is, he believes, the product of a delusion.[15] But not only is the psychological approach patronizing and uncharitable, it also suffers from the problem of unverifiability, for it is not easy to establish that a vaguely specified and unconscious cognitive bias has played a decisive role in a person's adopting a particular belief. The accusation is easy to make, but extremely difficult to prove or disprove. The psychological approach is a form of *ad hominem* criticism, directed at the person rather than the argument.

Carroll in fact has provided essentially no evidence whatever that the consensus among moral philosophers (as well as the general public) is

a product of cognitive bias. It is of course possible that such a claim is true, but bare possibility is not enough. It is furthermore hardly reassuring that Carroll has (as noted above) identified two distinct forms of such bias, without indicating which one is the main cause of our belief (or are they both equally responsible?).[16] Carroll's evidence essentially comes down to his personal intuition that belief in moral objectivity is somehow necessary to our self-esteem, and that the arguments in favor of moral objectivity are so flimsy as to create a presumption of some unconscious or unstated motive.[17] Carroll's intuition is one that is extremely common among scientists and New Atheists, the widespread (and almost certainly false) belief that the central guiding motivation for religious belief is the emotional consolation or comfort it provides.[18] But speculating about unconscious biases is not enough. As we have already seen that Carroll's one substantive argument against moral objectivity (his *a priori* principle that moral objectivity cannot exist in the universe) is unconvincing, we also note that Carroll has not addressed the substantial philosophical arguments in favor of moral objectivity. For even if Carroll could provide strong evidence of the existence of such a cognitive bias(es), he would still have to show that the cognitive bias actually produced the belief in question. But even this would not be enough: he would still have to show that the positive rational arguments in favor of moral objectivity are insufficient to justify that belief. A belief might be partially or even wholly produced by bias, and yet still be true.

In fact, it is far from obvious that there is an intrinsic bias to believe in moral objectivity. It is a familiar refrain in the history of philosophy that morality is often experienced as a burden, a restraint on our desires that many people would rather be free of. H. L. Mencken once famously quipped that "conscience is a mother-in-law whose visit never ends." Nietzsche also criticized morality as a burden on human aspiration: "Whoever reflects upon the way in which the type man can be raised to his greatest splendor and power will grasp first of all that he must place himself outside morality, for morality has been essentially directed to the opposite end: to obstruct or destroy that splendid evolution wherever it has been going on" (Nietzsche 1967, sec. 897). Many of the New Atheists have even argued in favor of rejecting religion on the grounds that it would liberate us from the burden of guilt and the restraints on our desires.[19] Further, it is obvious that naturalists have biases of their own, including the pleasure of debunking traditional beliefs and the satisfaction in showing how science (specifically, Carroll's own field of physics) provides us with the sole access to "fundamental reality," as well as pride in demonstrating that the naturalist, unlike the religious believer, can live without illusions (Carroll himself claims that accepting his theory "calls for a bit of fortitude" [431]). Virtually every human belief is potentially contaminated by bias; the mere accusation that

there is a possible bias in favor of moral objectivism is hardly sufficient to discredit that belief. Indeed, Carroll admits that he himself has a strong cognitive bias again moral objectivism (and religion): "I would rather live in a universe where I am responsible for creating my own values and living up to them the best I can, than in a universe in which God hands them down, and does so in an infuriatingly vague way" (149). Hence if anything the evidence is much stronger that Carroll is motivated by a bias against moral objectivism, than that philosophers are motivated by a bias in favor of it. In sum, Carroll has given us no good reason to reject moral objectivism on grounds of an alleged bias.

Toward a Pluralist Metaphysics

Carroll's poetic naturalism should be commended in its rejection of reductionism and scientism and its admission of multiple, distinct levels of reality. I have argued however that Carroll does not go far enough in his pluralism; there is no good reason to dismiss morality as merely a product of human invention. In fact, Carroll's pluralism can be described as halfhearted at best. His claim that only "underlying physical reality" is truly "fundamental" reality remains largely undefended and undefined (what constitutes being "fundamental," other than being the lowest level?). Further, a close analysis of his writing reveals his uncertainty about whether emergent entities should even be called "real" at all, despite his frequent insistent that emergent entities are indeed real. Thus it is somewhat disconcerting that he regularly puts the word "real" in quotation marks, and at one point writes that emergent entities "can be called 'real'" (Carroll 2016, 19)—hardly a strong endorsement of their genuine reality. We are also told that only the fundamental level truly exists, and "everything else is a convenient way of talking" (171). His characterization of emergent entities as "stories" or "ways of talking," frequently prefaced by the qualifiers "just" or "merely" or "simply" also suggests that Carroll is not totally convinced that emergent entities are real, as opposed to useful fictions or mere products of human discourse, like poetry invented by us but not really part of reality.

A thoroughgoing pluralist ontology (what Carroll calls "strong emergence") would reject Carroll's three-part hierarchy of diminishing levels of reality, the fundamental level, the real objective level, and the real but subjective level. For a true pluralist, no level of reality is privileged as more real or objective than any other. Thus Arthur Peacocke asserts that "There is no sense in which subatomic particles are to be graded as 'more real' than, say, a bacterial cell or a human person or a social fact" (Peacocke 1993, 41). It is not clear what advantages Carroll's more reductionistic hierarchy brings us, or why we need to find the mean between reductionism and pluralism.[20] One can of course concede that different levels have different

uses; fundamental physics is more comprehensive and more mathematical than other levels, but it has very limited use when it comes to complex entities, most notably rational entities such as persons. The field of ethics, at the opposite end, can be frustratingly inconclusive, and yet it is the most important field of all for practical purposes (even the practice of science is and should be constrained by ethics). There is no obvious need to create different categories of reality; it is not obvious why a fundamental particle should be taken as more real than a molecule or an organism, and why a cell or a tree should be more real than a moral rule. Physicist David Deutsch argues that "There is no reason to regard high-level theories as in any way 'second-class citizens.' Our theories of subatomic physics . . . are in no way privileged relative to theories about emergent properties" (Deutsch 1997, 27).

Ironically, despite his stated moral subjectivism, Carroll ends up adopting a position that sounds much like traditional moral objectivism. Though he insists we "invent" values, nonetheless at the same time he says that we can "shape our world for better or worse" (Carroll 2016, 418), that we can still believe in "moral progress" (417, 422). But a true moral subjectivist is not entitled to use those terms, since for them there is no independent, objective standard by which to say that one set of values is better than another. For the subjectivist, whatever values one adopts are by definition better. Moreover, Carroll also recognizes the centrality of ethics to the scientific process itself; he repeatedly reminds us of the necessity of acting in "honesty" and "good faith" in science as well as in any rational debates (e.g., 118, 137, 422, 430). Indeed, Carroll's book could be viewed as itself a moral treatise, a sermon on the necessity of honesty and good faith in our lives. Even the recommendation to pursue the truth is a moral prescription. Carroll's inability to avoid moral quasi-objectivism himself is further evidence of the indispensability of moral argument even for a scientist, thus making us wonder what the basis is for insisting on downgrading its ontological status. It also calls into question whether the notion of moral "subjectivism" is even well-defined, if in practice it is indistinguishable from moral objectivism. The defining question is whether the idea of "inventing" morality means any moral principle we create is as good as any other, or whether there are standards of better or worse. The moral objectivist claims that, just as the Indiana legislature cannot determine the value of pi, so too a society cannot simply determine that slavery is morally permissible. There are prior moral standards to guide us (even if there is substantial uncertainty and controversy about what the proper standards are).

Carroll attempts to find a middle ground between moral objectivism and moral relativism, by claiming that morality is not objectively real, and yet we create binding ethical rules. But as philosopher Alexander Rosenberg has pointed out, rather than finding an acceptable middle ground this position

ends up as incoherent: "Creating purpose in a world that can't have any is like trying to build a perpetual motion machine after you have discovered that nature has ruled them out" (Rosenberg 2011, 279). If normativity is inconsistent with science, then it cannot be created by human beings either. For humans are part of the universe too, so if humans can create norms, then norms can exist—so the argument that the existence of normativity is ruled out by science collapses. In the end, Carroll cannot have it both ways. Either norms are possible within naturalism or they are not; if they are not, then you cannot create them either. Calling them real but "subjective" does not provide a solution either—if morality is binding on us independent of our desires, then it is an objective norm in any meaningful sense. If it is not binding on us, then it is not a genuine moral norm, and morality is an illusion—moral preferences are in the end just one more form of desire, with no special normative status.

Why is Carroll then so resolutely opposed to the possibility of moral objectivism? In part, it may be (as I have suggested) his tendency towards reductionism. But judging from the overall direction of the argument in his book, what seems to motivate him is the fear that allowing for moral objectivism would open the door to allowing objective meaning and purpose into the universe, and that to do so would be to concede far too much to the religious worldview. Thus Carroll at one point refers to moral objectivism as a form of "transcendent truth" (Carroll 2016, 414). Now, "transcendence" is for him a dirty word, the sort of supernatural commitment that is the opposite of the scientific, empirical approach to the world (e.g., 130–31). However, as I have argued, moral objectivism does not imply "transcendence" (whatever that word may mean) any more than logic or mathematics implies transcendence, let alone religious commitment. Carroll's worry is that moral objectivism, by allowing for a form of otherworldly truth, opens the door to religious belief. And since religious belief, he assumes, is based on cognitive bias, then moral objectivism must be as well. Needless to say, the argument rests on a series of dubious assumptions and mere speculations. And, I might add, it suggests that his argument itself is based on his own form of "cognitive bias": the desire to stamp out any remnants of religious belief!

Conclusion

Sean Carroll's account provides a clear expression of a very influential reductionist tendency in modern thought but also the tools for a way out of this tendency. Physics remains the paradigm example of precisely verified empirical knowledge, and as such it is difficult not to judge such messy fields as moral philosophy negatively by comparison. However, Carroll rightly resists the extreme reductionist temptation, one in which the *only* true reality is that discovered by physics. It is disappointing then that he does

not extend this liberality to moral philosophy, since the only argument for excluding moral philosophy as a form of genuine knowledge is the extreme reductionist view that any property that does not appear at the level of physics cannot be real. But as we have seen, this argument is unsound, for virtually none of the properties of higher level entities appear at the level of physics. Carroll's pragmatic principle—what is real comes down to what is useful in negotiating reality—leads rather to the conclusion that morality should be taken as objectively real. Nor can it be said that any properties posited by moral philosophy explicitly contradict any principles of physics—no one claims that morality requires violation of any laws of physics. In short, Carroll seems to have been unable to fully extricate himself from the reductionist and scientist tendencies that are so prevalent. What we end up with, as so often in naturalistic philosophies, is a form of mind-body dualism: there is the physical world, and then there is the product of human minds (values, ideas, logic) which exists on a different level of reality. In contrast, a true pluralistic naturalism provides us with a single, coherent unified theory of rational behavior: all rational processes (science included) presuppose norms; the normative is just as real and fundamental as the descriptive. If so, pluralistic naturalism, rather than undermining moral objectivity, provides strong support for it.

Notes

1. Carroll largely takes for granted in this book that religion can no longer be part of our worldview.
2. And also avoids the notorious problems with making sense of causation taking place at multiple different levels of reality.
3. It is not quite clear what Carroll means by "incompatible," though presumably he does not mean that the principles of one level contradict those of other levels, only that the one level is not explicable in terms of the other.
4. Clearly this is meant as a partial list; presumably it includes all of the natural and social sciences. It remains unclear just what is the status of humanities disciplines such as history, literature, and philosophy.
5. Carroll's mixing up of two distinct categories, entities versus fields of study, is confusing. Nor is it clear why physics should be grouped along with biology and psychology, at least with regard to physicists who study the fundamental level of reality. However, elsewhere in the book he describes these three categories as three different kinds of descriptions of the world (Carroll 2016, 20–21).
6. I discuss the issue of mathematics below.
7. For a defense of moral objectivism, see Huemer (2005); Rachels (1999); Timmons (2002).
8. Carroll acknowledges this difficulty on page 408.
9. Presuming of course one accepts that "emergence" is a useful or meaningful term; it has been widely criticized as presupposing a reductionist position, such that only fundamental entities are real and everything else "emerges" from them.
10. The classic expression of this view is John Mackie's argument that values are too "queer" an entity to be part of the scientific world view. See Mackie (1991).
11. I have argued elsewhere (Kaufman 2016) that even the notion of free will does not contradict any scientific laws. Moreover, Carroll's theory posits that we choose or create our values, and thus seems to require a strong notion of free will.

12. This obscurity about mathematics is common among naturalists. See for example Jerry Coyne's insistence that mathematics is not a genuine form of knowledge of the world, but merely knowledge "about the logical consequences of a series of assumptions" (Coyne 2015, 188). It is unclear why he, like Carroll, thinks that logical knowledge is not knowledge of the world—if logical principles exist, surely they are part of the world (what else could they be?). In any case, this simply evades the question of whether they are objectively normatively binding on us, the same question that arises for morality.

13. For example, Bayesian reasoning tells us what we "should" take into account and that we "can't pick and choose" the evidence (Carroll 2016, 82), and that this method requires us to "objectively weigh the evidence" (Carroll 2016, 149).

14. The classic expression of the situation is in the Davis and Hersh book *The Mathematical Experience*: "Most writers on the subject seem to agree that the typical working mathematician is a Platonist [views mathematics as discovery] on weekdays and a formalist [views mathematics as invention] on Sundays. That is, when he is doing mathematics he is convinced that he is dealing with an objective reality whose properties he is attempting to determine. But then, when challenged to give a philosophical account of this reality, he finds it easiest to pretend that he does not believe in it after all" (cited in Livio 2009, 225; bracketed comments by Livio). One might speculate that if mathematicians recognized that the "discovery" view does not entail a strict Platonism (i.e., an independent ontological reality), they might be far less concerned about admitting their objectivism.

15. Carroll accepts as true Joshua Greene's psychological studies purporting to refute deontology as a valid moral theory (Carroll 2016, 406-07), unaware that Greene's study has been refuted on multiple fronts (see Kahane 2012; Berker 2009).

16. Further, his claim that the desire to resist evil people represents a "bias" gets things exactly backwards. The imperative to fight evil is a *product* of the belief in moral objectivism, not a biased motivation to believe in it.

17. Carroll at one point refers to the "consolation of objective certainty" (2016, 415), but this is a red herring. Objectivity is very different from certainty, and no moral objectivist would probably ever say that moral principles are known with certainty. So even if certainty would be consoling, it does not follow that objectivity is.

18. Carroll's endorsement of this theory is evident throughout the book (e.g., 149, 427).

19. For instance, Richard Dawkins (2004), Chapter 9.

20. Carroll questions the "operational benefit" of moral objectivism, but one could ask the same question regarding his moral subjectivism—not to mention the potential great harm of revealing that moral truth is an illusion.

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