

Book Review

The Singular Universe and the Reality of Time: A Proposal in Natural Philosophy. By Roberto Mangabeira Unger and Lee Smolin. Cambridge University Press: Cambridge, UK, 2014; 566 pp.; ISBN-10: 1107074061, ISBN-13: 978-1107074064

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To do genuinely interdisciplinary and transdisciplinary work is the goal of many scholars. Some achieve it better than others. But to engage in truly systematic and all-encompassing scholarship almost seems anachronistic, not to mention a trifle arrogant. Given the complexities involved in mastering even a single discipline, who could have the audacity to claim expertise across them all.

Such ambition and systematicity, not to mention the borderline audacity that underlies it, is part of the thrill that comes from reading any book Roberto Unger. Where others might painstakingly tie themselves into knots justifying their right to engage in interdisciplinary and transdisciplinary work, Unger simply steamrolls over all objections to think and write about whatever he wishes. In many, this might simply be intellectual over reach. But Unger is the rare exception. His seemingly encyclopediac capacity for philosophical systematization has moved from impressive to genuinely inspiring in his recent work.

Unger began his career at Harvard Law in the 1970s, as a founding member of the critical legal theory movement in American jurisprudence. His youthful manuscript, *Knowledge and Politics*, remains a minor classic and develops a reasonably novel criticism of liberal legalism. However, it was not until the 1980s that Unger's distinct philosophy was fully presented in his book on the human personality *Passion*, and the seminal three volumes of *Politics*. In the latter trilogy especially, Unger develops a novel set of philosophical ideas that he has continued to deepen until this day. In *Politics*, Unger condemns both liberal and Marxists for believing that the human personality and anthropic history can be understood through conceptualizing sets of eternally applicable "scientific" laws. This scientific ideology reinforces belief in the false necessity of social institutions which are the products of these laws and results in a frozen politics defined by immutability. He argues we must reject this "false necessity" and adopt a more open-ended and democratic approach to politics.

One might be tempted here to classify Unger as a post-modern critic, but he rejects this easy route, claiming that post-modern skeptics are left either inert or believing in the ultimate determinacy of history while rejecting all theories which attempt to explain it comprehensively. This vision of history (quite literally) reaches an appropriate peak in his book *The Singular Universe and the Reality of Time* published by Cambridge University Press, co-written with Lee Smolin, of the Perimeter Institute of the University of Waterloo, who handles many of the more technical aspects of their proposal. Unger is primarily responsible for the philosophical claims, which will be the focus of my review. Readers interested in Smolin's positions would be advised to pick up his excellent and readable text *Time Reborn: From the Crisis in Physics to the Future of the Universe*, which deals with many of the same issues from a more strictly scientific perspective.

The Rejection of Platonism

The Singular Universe is a weighty book containing many complex claims. But the basic through lines are admirably clear. Unger and Smolin believe that the discipline of physics has been hampered by their adherence to certain methodological and even metaphysical assumptions. The most central of these is that time is fundamentally an illusory, or at best purely subjective, feature of the universe we inhabit. Unger and Smolin believe that many physicists are led to this belief about time because they ontologically privilege the “laws” of physics over the various instantiations of those laws seen in the activity of physical phenomena. These laws are seen as ontologically prior to experience. This leads physicists to adopt a “vulgar” Platonism by claiming that the fundamental and eternal laws of nature can only be understood mathematically rather than through empirical assessment. For aesthetic reasons, many physicists believe it is more important to focus on using mathematics to understand these eternal laws rather than being attentive to the real and changing world around them, which evolves with the passage of time.

By contrast, Unger and Smolin believe that, while mathematics is a useful tool for physicists, its models should not be ascribed such tremendous ontological significance independent of empirical considerations. Unger and Smolin believe that a more speculative, but also empirically minded, approach to physics is the only way to cure the discipline of an addiction to Platonic abstractions. They argue that physicists should instead pragmatically engage in reflection about the empirical data presented to them before checking it against the most reliable metaphysical proposals available. This process would better enable physicists to reach an epistemic equilibrium between metaphysics and empirical facts. They can then engage in sophisticated and empirically testable speculation about the most basic characteristics of our universe without being beholden to the prejudices of mathematical models.

Applying their unique methodology to more concrete questions, Unger and Smolin believe that physicists should begin to look at evolutionary biology and social theory for ontological models of how the universe operates. Drawing on Unger’s earlier work, both authors believe that these latter schools of thought gradually abandoned a belief in the “false necessity” of eternally operative laws. Unger and Smolin interpret Darwin as saying that life, and for that matter society, evolves without a teleological orientation wherein eternally operative laws give rise to inevitable patterns of biological organization. By contrast to deterministic theories of biology and society, this implies that the future for life and the social world is probabilistic and can be changed by shifts in the past. Unger and Smolin find it unusual that this Darwinian model possesses a great deal of explanatory power in the realms of evolutionary biology and social science, and yet it has not been adopted by physicists. Unger and Smolin believe that it would be a methodological and ethical advance on previous, Platonically oriented positions for physicists to adopt such an evolutionary perspective. It would be methodologically superior because it would enable them to more effectively test their experiences against mathematic models without granting the latter undue significance. This is because, where Platonic models focus on laws, Darwinian models must look at the particular way a given entity evolved over time. Each organism and social form is different and needs to be explained independently of general tendencies. Unger and Smolin believe that same approach should be taken in physics. They also believe their model would be ethically superior because limiting mathematics in favor of descriptive language would enable other intelligent individuals to engage more creatively and inclusively in discussions about the nature of our universe, including philosophers and even intelligent laymen. Indeed, Smolin himself recounts that he was initially “seduced” to the discipline of physics in part because of the supreme elegance and simplicity of Einstein’s writing. As it is, they believe the opaque quality of physics transforms it into a more hermetic discipline occupied by experts who, despite their virtues, have been unable to resolve the most basic problems of their discipline. Much of this was explored already Smolin’s earlier book *The Trouble with Physics*, though this distrust of elite opinion also pervades Unger’s oeuvre. Unger and Smolin believe that making physics a more open discipline might enable it to assimilate insights that

practitioners would be unable to conceive of on their own. Reducing the emphasis on mathematics would be a crucial step.

The Singular Universe and The Reality of Time

Having accounted for what distinguishes their approach to physics from others, we can now briefly discuss Unger and Smolin's substantive claims. They make two claims about the nature of the universe that are important. The first is that time is real rather than an illusion experienced by finite beings in one part of the universe. The second is a rejection of the multiple universes, or multiverse, hypothesis. To Unger and Smolin, the universe we inhabit is the only one that is existent at any given moment in time.

Their position concerning time is predicated on two arguments, one of which has already been discussed. This first argument is that the universe as we experience it is the product of relational and contingent processes which lead to probabilistic outcomes. As mentioned before, they draw an explicit parallel here with the Darwinian model. The interactions of the various objects and forces, in reality, create tendencies which assume a law like behavior, but laws do not pre-exist and determine these interactions. Resultantly the universe, and indeed everything within it, is not a necessary outcome of eternal laws operating within what finite subjects experience as space-time. The second argument follows that since the universe is not fated to be a given way at every "moment," time must be accorded a robust ontological status within nature. Here, Unger and Smolin contrast their views with other historically significant perspectives. Newton felt that time was simply phenomena experienced by finite beings within the mind of God, and Einstein believed it was phenomena experienced by individuals moving within a relative worldline. Part of this was because they believed that the universe must operate according to necessary, and therefore deterministic, eternal laws. This implied that time was an illusion; albeit an important one. By contrast, Unger and Smolin argue that since the laws of nature appear to be contingent and constantly evolving, the future remains undetermined. This suggests that time does exist and that what occurs within it is open-ended. To invoke the classical metaphor, God could not stand outside the world with perfect knowledge and know everything that was going to happen within it because what occurs within the world is determined by the actions in it, not by laws which are known in advance.

Unger and Smolin's second major claim that the universe is singular, is also central to the book. In my opinion, it is somewhat less interesting to anyone not already engaged in the multiple universe debate. Many of their arguments for the singular existence of the universe flow from what has been said before and are predominately negative rather than constructive. Unger and Smolin believe that the multiverse hypothesis is unempirical, because assessing whether it is true, is by definition, beyond the reach of empirical inquiry. They understand the multiple universe hypotheses as being developed to make quantum mechanics palatable to physicists by suggesting the world was still deterministic at base rather than probabilistic. What appears to an individual subject to be probabilistic, tendencies at the fundamental level can actually be re-described in a deterministic (if fanciful way) since all probabilities will be ultimately be realized in the multiverse. Unger and Smolin believe that this is putting the needs of theoretical prejudice ahead of plausibility. They suggest that if quantum mechanics suggests we live in a probabilistic universe, perhaps we must simply accept this and spell out the consequences. Unger and Smolin also argue in a Leibnizian vein that the idea of a multitude of discrete universes existing is unattractive because it would be impossible to decisively answer the fundamental question of why any particular universe evolved at all. If the multiverse theory is understood as Unger and Smolin conceive it, within each member of a potentially infinite series of universes some distinct sequence of possibilities would come to pass. But understood in the broadest way, this implies that every possibility will ultimately be realized. Since the number of universes is constantly growing, every possibility, even those that seem rationally absurd to us, must eventually be realized. This strikes the authors as deeply unscientific. They feel that there must be boundaries on what can occur and not occur which are determined by empirical facts, which the multiverse tends to obscure since all

possibilities must ultimately be realized within it. Finally, they offer several reasons why their own account of a singular universe existing in real time meshes more consistently with the given scientific consensus on the facts while also enabling physicists to better resolve open controversies. Many of these arguments are interesting, but none come across as particularly decisive.

Unger and Smolin's book is a tremendous contribution to the literature on an inherently interesting topic. Evaluating all its various facets and segues would take significant space. Instead, I will focus exclusively on one problem: Their unremitting attack on mathematics. While I agree with many of their critiques of Platonism, I remain uncertain that it can be avoided in all circumstances. This is especially true regarding Unger and Smolin's treatment of the infinite, and how it applies to various empirical phenomena. Unger and Smolin conceive of the infinite as essentially a heuristic term of some use but without actual substance. This applies both to cosmological phenomena that have typically been understood to involve infinite quantities related to mass and density, and to mathematical "inventions" such as the system of transfinite numbers. While they offer some reasons for their position, none of them are particularly convincing. Most involve simply trying to tame the infinite by suggesting that it is little more than a pragmatic tool that cannot be connected to any empirical object. But this strikes one as quite obscure. First, it seems clear since at least the 19th century that the infinite cannot be conceptually pragmatized in the way Unger and Smolin want. Their account might have been true of the more transcendental accounts given by scholars like Kant, who did indeed use the infinite in a manner akin to a heuristic device. But in a post-Cantorian world, we have developed considerably more rigorous interpretations of the infinite and the problem of the continuum that are not so easily pushed aside. This brings me to my second point. Unger and Smolin might be able to avoid this issue if it were just a matter of mathematical interest. But the mathematics of the infinite does pertain to important issues in physical theory; a point which has been acknowledged by other philosophically minded physicists such as Roger Penrose who points to its necessity when interpreting Hilbert Spaces in his book *The Road to Reality*. This is just one example of many that could be raised, but Unger and Smolin seem largely disinterested in engaging this issue in a comprehensive way.

This suggests that Unger and Smolin's anti-mathematic disposition might be less steady than they claim. Indeed, at some points, Unger and Smolin's anti-Platonism comes across as doctrinaire. How this might problematize their philosophy of nature more generally, I leave to the reader. To give just one example that comes to mind, it remains unclear to me how Unger and Smolin can successfully answer some of the classical cosmological antinomies, such as whether the universe had a beginning or not in time, without wrestling more deeply with these matters. Determining whether the universe had a beginning or end necessarily involves questions of the finitude of not of time, and any answer they provide is unlikely to be convincing without a more thorough engagement with the mathematics on the issue. Another question raised that is less directly obvious is how Unger and Smolin would relate their philosophy of nature to accounts of consciousness that also draw on the mathematics of the infinite. For instance, in his *Pragmatism Unbound*, Unger references the linguistic theories of Noam Chomsky to give weight to his argument that human consciousness has a creative capacity to transcend social determination. But Chomsky's linguistics depends heavily on Cantorian insights about the infinite, particularly in his arguments about semantic novelty. Chomsky believes that consciousness can articulate a potentially infinite number of novel sentences and analyses this using the tools provided by the mathematics of infinity. This is also Penrose's tactic in the more Gödel inspired work, *The Emperor's New Mind*. Both these accounts of consciousness rely on the mathematical insights to show how our mind is not entirely determined by empirical reality, and it is unclear how Unger can make a similar argument without relying on analogous tools.

Conclusions

Despite these reservations, this latest co-authored book rounds off Unger's oeuvre and gives him good claim to be called one of the great philosophers of our time. *The Singular Universe*, when read alongside his previous texts, presents a comprehensive, detailed, and ambitious philosophical system

that can serve as a springboard for conversation and action. Whether it holds up over time is obviously something that cannot be predicted in advance (especially if Unger is right). But in an academic climate that all too often favors piecemeal critical approaches, his work is a breath of fresh air that commands respect and should prompt admiration. Whether one buys into his system, the world needs more thinkers with Unger's courage and intellectual ambition.

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