Critique of Daniel Dennett's, *From Bacteria to Bach and Back, the Evolution of Minds*

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Abstract

My starting point for this paper is the common view: nature has produced human beings. Accordingly, I seek an account of nature that can support an account of how human beings have come into existence on this planet. I regard human inquiry as an extraordinary phenomenon, especially our scientific inquiry into the natural world. An account of nature would be deemed a failure if it turned out to block an account of how human inquirers have come into existence on this planet. It would also call into question its own claim to be known. Such a failure would motivate seeking a richer view of nature. From this starting point I approach Daniel Dennett's From Bacteria to Bach and Back, The Evolution of Mind which aims to draw on the best scientific theory today of how our minds came into existence. The book aims to show how increasing competencies of biological organisms passes over into comprehension facilitated by the evolution of communities where people are called on to justify their actions, thoughts. The paper argues that the book fails in this aim, signalled for example, by Dennett's partial appropriation of the work of W. Sellars on the logical space of reasons. Dennett overlooks Sellars' distinction between the logical space of reasons and the logical space of explanation in terms of natural laws, and that the former cannot be cashed out in terms of the latter. The last part of the paper considers what would be involved in a principled approach to forming a richer view of nature.

Keywords: nature; laws of nature, logical space of reasons, logical space of explanation by natural law, reasons without reasoners.

Introduction

My starting point is the common view: nature has produced human beings. Accordingly, I seek an account of nature that can support an account of how human beings have come into existence on this planet. I regard human inquiry as an extraordinary phenomenon, especially our scientific inquiry into the natural world. An account of nature would be deemed a failure if it turned out to block an account of how human inquirers have come into existence on this planet. It would also call into question its own claim to be known.

Daniel Dennett says the book, *From Bacteria to Bach and Back, The Evolution of Minds Dennett,* (2017) (hereafter *Bacteria to Bach*), "is a sketch, the backbone, of the best scientific theory to date of how our minds came into existence, how our brains work all their wonders, and, especially how to think about minds and brains without falling into alluring philosophical traps (Sellars et al, 1962)." This looks exactly what I am seeking, an account of how human inquirers have come into existence on this planet. I find myself agreeing with much of

what Dennett has to say, scientifically, yet I claim that his book blocks giving an account of human inquirers. To support that claim, I list Dennett's twelve main ideas in the story of the evolution of human beings and I summarise discuss the four of those I judge important in Dennett arguing his case for the evolution of human inquirers.

Summary of Dennett's View

Dennett tells the story of the evolution of life from bacteria to Bach with twelve key ideas supported by a great deal of scientific work with some acknowledged speculations, and some rejection of counter-positions. I am in large agreement. Here are Dennett's twelve key ideas [1,4-5];

1. Darwin's strange inversion of reason
2. Reasons without reasoners
3. Competence without comprehension
4. Turing's strange inversion of reason
5. Information as design worth stealing

Here I discuss four of these sections from which I assess Dennett's views.

Reasons without Reasoner

The abiotic world is full of processes, of cycles with different periods of repetition and with different persistence over time. "Differential persistence must then gradually turn into differential reproduction [1,47]." By the time we get to a reproducing bacterium, there is functional virtuosity galore. "In other words, there are reasons why the parts are the way they are. We can reverse engineer any reproducing entity determining its good and its bad and saying why it is good or bad [1,47]."

"[W]e see the gradual emergence of the species of reasons out of the species of mere causes, *what fors* out of *how comes,* with no essential dividing line between them [1,48]."

Dennett correctly say there are *how comes* – mere causes – but for <u>blind</u> processes can there be any *what fors?* In Dennett's work, the idea of what fors is only glimpsed in his reference to reverse engineering performed by reasoners with comprehension of intelligent design [1,42,48]. I am supported in this view by Dennett inviting us to imagine "a process where persistence gradually turns into multiplication of some type of items, where before there were none and we ask, 'Why are we seeing these improbable things here?' Dennett says the question is equivocal! For now, there is both a process narrative answer, *how come* and a justification, *what for* [1,48]." As we shall see the language of justification belongs to the logical space of reasons whereas the process narrative telling *how come*, is told in terms of the logical space of explanations under natural law. As we shall also see, there is an essential line between the two logical spaces.

If it is correct to say there are reasons (*what fors*) before there are any reasoners only reasoners with comprehension can introduce this way of redescribing the blind *how comes*.

Inversions of Reasoning

Robert MacKenzie Beverley, 1886 sums up the "essential purport of the Theory and to express in a few words all Mr Darwin's meaning, "who by a strange inversion of reasoning, seems to think Absolute Ignorance fully qualified to take the place of Absolute Wisdom in all the achievements of creative skill (Dennett, 2017)." Dennett makes a similar point about Alan Turing using Beverley's language, "In order to be a perfect and beautiful computing machine, it is not requisite to know what arithmetic is." [1,55.]. Dennett sums up: "Darwin and Turing claim to have discovered something truly unsettling to a human

mind - *competence without comprehension."* [1,56.] This goes against the view that competence follows comprehension. "This is indeed a strange inversion, overthrowing the pre-Darwinian mind-first vision of Creation with a mind-last vision of the eventual evolution of us, intelligent designers at long last [1,58]."

I accept Dennett's examples and accompanying narrative of the evolution of a vast array of increasingly complex biological forms of greater competencies without comprehension and that his task is to explain how comprehension evolved from competence, where 'comprehension' is shown in what he calls his "top-down" examples of intelligent design by human beings illustrated by Gaudi, Turing, Picasso, [1,197] to which he add Bach, Einstein , Shakespeare [1.324].

The logical space of reasons

Dennett refers to Wilfred Sellars (Sellars, 1962) (with no page reference) speaking of the human interaction of asking each other to justify our choices and actions as creating or constituting "the logical space of reasons". [1,41.] "The space of reasons is bounded by norms, by mutual recognition of how things *ought* to go – the right way, not the wrong way to play the reason giving game. Wherever there are reasons, then, there is room for, and a need for, some kind of *justification* and the possibility of *correction* when something goes wrong… This normativity is the foundations of ethics: the ability to appreciate how reason giving *ought* to go is a prerequisite for appreciating how life ought to go in society." [1,41, emphasis original.]

Earlier, Sellars had said, "In characterising an episode or state as that of *knowing*, we are not giving an empirical description of that episode or state; we are placing it in the logical space of reasons, of justifying and being able to justify what one says [3,298]." and again, "the idea that epistemic facts can be analysed without remainder – even in principle – into non-epistemic facts, whether phenomenal or behavioural, …. is, I believe, a radical mistake – a mistake of a piece with the so-called naturalistic fallacy in ethics[3,257]." Clearly, what Sellars says on the 'logical space of reasons' is also relevant not only to ethics but also to epistemology and human inquiry. Dennett gives just a hint of this connection between epistemology and the logical space of reasons when he adds [1;42,48] instrumental 'reverse engineering' as drawing on the logical space of reasons.

In discussing an episode or state of knowing Sellars says we are placing that state in the logical space of reasons in contrast to giving an empirical description of that state. John McDowell [4;94,95] makes the contrast between the logical space of reasons and the space of explanation via natural law, as natural law has come to be understood within the rise of modern science. Under these conditions McDowell says, "it is tempting to identify nature with the subject matter of the natural sciences so conceived." McDowell says that when "Sellars warns of a naturalistic fallacy he is implying that the structure of the space of reasons is sui generis by comparison

with the kind of structure the natural sciences find in nature [4, 92].” McDowell shows how Sellars space of reasons can include not only knowledge, but also Davidson's propositional attitudes and Dennett's intentionality [4, 93].

From Sellars and later McDowell I add to Dennett's discussion of the logical space of reasons the contrasting logical space of explanation by natural law, which as far as I can see Dennett omits. The point I take from Sellars, and McDowell is that the logical space of reasons is logically different from the logical space of subsumption under natural law. This has significant consequences. I conclude that no story situated in the logical space of explanation by natural law can ever become a story about activities situated in the logically different space of reasons. It follows that Dennett's engrossing stories of the about the vast evolution of biological competencies can never become a story about comprehension, which presupposes the logical space of reasons.

'User Illusion'
According to Dennett, "The manifest image composes our *Umwelt*, the world we live in for almost all human purposes – aside from science. … We view our prospects, make our decisions, plan our lives, commit our futures in its terms. It's life or death for us, and what else could matter more? Our own reflections on all this are cast in terms of meanings, or contents, the only readily usable 'access' we have to what goes between our ears and behind our eyes." [1,366.]

"Our thinking is enabled by the installations of a virtual machine made of virtual machines, made of virtual machines, made of virtual machines. The user interface of an app exists in order to make the competence accessible to users – people – who can't know and don't need to know the intricate details of how it works. The user-illusion of all the apps in our brain exist *for the same reason:* they make our competences (somewhat) accessible to users…." [1,341.] Dennett's idea (shared with others) is that "explaining ourselves to others is the novel activity that generates the R&D that creates the architecture of human consciousness." [1,344.]

My difficulty with Dennett's idea about user apps giving us some access to our competencies, is that the apps cannot give us access to comprehension. Recall Sellars point that attempting to get epistemic facts from empirical descriptions of natural processes is akin to the naturalistic fallacy in ethics. It is not logically possible to get an 'ought' (epistemic or ethical) from descriptions of natural processes operating according to natural laws, including all the virtual machines, that according to Dennett have been loaded into the brain by genetic and cultural evolution. It is not logically possible to obtain relations of justification from lawful natural processes that just happen. The virtual machines are logically unable to produce the user illusion enabling us to engage in explaining and justifying our actions to each other, as all these presuppose the logical space of reasons, whether with respect ethics or the normativity informing our many forms of inquiry.
The account of nature Dennett is using is not rich enough to do

the explanatory work he wants to do, in accounting for human inquiry via "a sketch, the backbone, of the best scientific theory today of how our minds came into existence, how our brains work all their wonders, and, especially how to think about minds and brains without falling into alluring philosophical traps."

Besides Dennett holding strongly to the many branches of the natural sciences, he also espouses scientific naturalism as his metaphysics. Scientific naturalism is the conjunction of naturalism - the claim that nature is all there is and hence there is no supernatural order above nature - with the clam that all objects, processes, truths, and facts about nature fall within the scope of scientific methods (Davis & Collins, 2002). Dennett certainly wants to banish any suggestion of gods or God or any supernatural order, relative to this natural order conceived by naturalism. These are mere 'sky hooks' not 'cranes' that can do real work [1,54].

Summarising My Argument
There is much to say about human inquiry [7] and here I want include the following claims.

(i) Human inquiry has a normative dimension that is both evaluative (says what counts as good arguments/ good experiments), and regulative (e.g., says inquirers ought to take on board the good arguments/experiments relevant to their inquiries).

(ii) Human inquiry presupposes that the field being inquired into is intelligible and open to rational explanation and I add, without prejudice to the forms of intelligibility and the forms of rationality that may be called for. The first part of the previous sentence comes from Ward, [6]. Ward, notes this is what K. Popper, (8,438) would call a metaphysical assumption of science. Ward thinks this presupposition is not the result of empirical inquiry but rather what gets and keeps inquiry going.

(iii) The logical space of reasons is logically different from the logical space of explanation in terms of subsumption under natural law.

(iv) From (iii): the explanation of human evolution in terms of the operation of natural laws, however it is elaborated, logically cannot lead to an explanation of the human capacity to grasp rational inference, which occurs in the logically distinct space of reasons. I don't expect any evolutionary story in terms of the operation of natural laws leading to biologically more complex entities with extraordinary competencies to lead on to an account of the kind of comprehension identified by Dennett in his prime examples Einstein, Turing, Picasso, Shakespeare et. al.

(v) From (iv) the explanation of the 13.8-billion-year-old evolution of the universe, using all the resources of the natural sciences, though stunningly surprising in so many ways, and encompassing so much, cannot on its own provide an adequate account of how human inquirers ((i) to (iii)) have come into existence on planet earth.

(vi) From (i): the 'evaluative' dimension says what counts as good arguments or good experiments and the 'regulative' says inquirers ought to take account of the good arguments and good experiments relevant to their inquiry. Those espousing physicalism (the strongest form of scientific naturalism) have made various attempts include the regulative ought in their account of human inquiry by using a hypothetical imperative, but do not succeed, as made clear by the physicalist D. Papineau, [9] who was persuaded that a hypothetical imperative is not available to naturalists like himself. See also S. Ames, [10,263-268].

The last reference includes a private communication from Michael Smith of Princeton explaining how to give a consequentialist reading of an 'ought' statement. Smith later criticised my response to his argument by pointing me to his constitutivism in metaethics [11] and inviting me to imagine "that you have aching limbs and cold extremities, so you go to the doctor. He examines you and then wonders aloud, 'Why isn't your heart functioning properly?', or perhaps, 'Why isn't your heart doing what it is supposed to do?', or even 'Why isn't your heart doing what it ought to do?' How are we to explain these uses of 'properly', 'supposed to', and 'ought'? The answer lies in the fact that a heart is something whose function is to pump an adequate supply of blood around the body (an is-claim). This entails that a properly functioning heart pumps an adequate supply of blood around the body (an initial ought-claim), that a defective heart is one that fails to do so (another ought-claim), and that hearts are supposed to pump adequate supplies of blood around the body (yet another ought-claim). The doctor's uses of 'properly', ' supposed to', and 'ought' are in this way explained by reference to the heart's pumping an adequate supply of blood around the body (an is-claim)." [11,372]. I have two responses. In my view, Smith's example of the doctor's 'ought claims' and 'is-claims' might easily be accounted for by saying the doctor has idealised the heart as if it were a designed system as a useful tool for diagnosis. My second point concerns what is thinkable assuming physicalism. This can't be addressed by Smith's example, without assuming human beings, including doctors, are physicalist entities. But that is what I am questioning.

According to physicalism, what there is, is what physics says there is, or complex configurations of the same. At any stage in the evolving complexification process leading to humankind, a scientific account of the complex physicalist entity will be in terms of the (probable) range of its operations under various changing conditions, but logically these accounts cannot provide a basis for saying what ought to happen, including no basis for saying what ought to happen in human inquiry. What has to be shown is how a physicalist entity however complex can have language with which we are familiar, including normative language that is evaluative and regulative. Smith does not show this, and Dennett, for example, simply assumes it in invoking his 'user illusion', [1,341f].

Assuming nature has produced human beings, then in the light of this argument concerning human inquiry, a richer account of 'nature' is needed that includes but goes beyond the natural sciences. On its own, the scientific story about the evolution of human beings is unable to properly include the human beings who are telling that scientific story. This is because on its own it cannot give an adequate account of human inquiry.

A Start towards a Richer View of Nature

If it is true that nature has produced human beings, then we need a richer view of nature than that offered by Dennett. Where to Start? McDowell response is instructive. He takes Sellars point that the structure of the space of reasons is *sui generis* by comparison with the kind of structure that the natural sciences find in nature and then says that it is understandable that this distinction should generate metaphysical anxieties which "crystallise in a felt threat of supernaturalism." [4, 93.] McDowell says, "we can avoid those anxieties if we can entitle ourselves to count thinking and knowing as natural phenomena after all." This we can do by holding our thinking and knowing are not supernatural but are aspects of our lives, "understood as the career of a living thing, and hence obviously, the concept of something natural." McDowell accepts Sellars contrast between the logical space of reasons and the realm of law, and says, "it need not imply that the space of reasons is alien to the natural."

McDowell's approach "does not accept that to reveal thinking and knowing as natural we need to integrate into the realm of law the frame in the concepts of thinking and knowing function." [4;94,95] For McDowell, 'nature' is clearly larger than the realm of law uncovered by the natural sciences.

Two issues are firstly, just what is the larger view of nature to which McDowell is pointing? It is not clear to me, save that it includes the realm of laws shown by the natural sciences and the space of reasons disclosed in our knowing and our propositional attitudes. Secondly, I was not aware that supernaturalism to which he also refers was a matter of some anxiety among those identifying nature with the vast realm of law identified by the natural sciences. I have been more aware of people like Dennett confidently dismissing of any suggestion of the supernatural – a mere 'sky hook'. Dennett and McDowell agree at least in not countenancing anything supernatural in the stories they tell.

If it is true that nature has produced human beings, then based on the above argument we need a richer view of nature than that offered by Dennett. Where to Start? We can't start just anywhere. Is there a principled starting point? Since human inquiry resists being completely naturalised, I take this as a principled starting point. (There may be others.) Human inquiry resists scientific naturalism's account of what there is and shows it to be a too narrow account. Something of what there is shows up in human inquiry as not being able to be completely squeezed into a scientific view of the world. I take human inquiry as a principled starting point for a richer view of nature. But how to proceed?

Recall 3(ii). Human inquiry presupposes that the field being inquire into is intelligible and open to rational explanation without prejudice to the forms of intelligibility and the forms of rationality that may be called for. The richer view of nature begins by generalising 3(ii) as follows. History shows the incessant character of human inquiry, especially the last 450years of scientific inquiry. Human inquiry conducts itself and envisages itself as continuing. It does not envisage itself as coming to an end. Even if institutions (secular or religious) suppress inquiry, questions continue to erupt! Let us recognise these aspects of human inquiry by the assumption that "all there is, is fully intelligible", again without prejudice to the forms of intelligibility involved. I take this as a presupposition of this richer view of nature. This generalization is parallel to the generalization that is at the base of physicalism – all there is, is what physics says there is, or complex configurations of the same. Each is a move beyond physics because physics does not make either move. Each is a move to metaphysics.

Clarification. The generalised presupposition does not entail that everything is fully intelligible to us now. However, it does entail that human inquiry will never be faced with a 'brute fact', a fact for which there is no explanation. Furthermore, inquiry is not faced with an infinite regress of explanations of the way things are, for then the supposedly 'fully intelligible' is unintelligible. One way this presupposition can be challenged is via an open ontological question, 'Is all there is, fully intelligible? After all, the universe may be a brute fact.' My reply is that this claim risks falling into a 'gaps' argument by asserting that something is a 'brute fact' when without further argument all we can mean is that we haven't yet filled the gap in our explanation.

This general presupposition of a richer view of nature is an abductive inference [12] motivated by 3(i)-(vi), and by the incessantly expanding character of human inquiry, especially the last 450years of scientific inquiry. Other challenges quickly come into view by seeing that two questions follow from the general presupposition: (a) why is there anything at all? and (b) why is the universe structured and structured the way it is? These questions are unavoidable for anyone claiming that all there is, is fully intelligible. Each why-X question can be taken to mean how has X come about, or for what purpose has X come about. If the presupposition of full intelligibility of all there is, is true of this world, then we should expect to find an answer for howX and for what purpose X, for each case when X = (a) and X = (b). Seeking a richer account of nature using the general presupposition is no easy path. Here I am only making a start.

There is a traditional answer to (a) why is there anything at all? [13]. That question can only be answered if there is something that explains the existence of everything else, the very nature of which explains its existence, which is to say its existence does not depend on anything else, but rather exists necessarily. This is the idea of God, the creator of all there is ex nihilo – that is to say, not from pre-existing 'stuff' [14]. Such a God would have complete understanding, including

therefore self-understanding, including being self-explanatory. Ward, [6,8] comments, "being self-explanatory, after all, does not entail that anyone else can understand the explanation, only that it exists." I would add, nor does it entail that no one can understand the explanation. Here is the beginning of an answer to the first question – why is there anything at all? It is a beginning of an answer because, this idea of God has been variously criticized and here I will only take up two criticisms.

Firstly, the claim that God created everything often provokes the question, 'who created God?' It is not hard to see an infinite regress of such questions. On the other hand, Laurence Krauss, [15,167,170] concedes that if God is understood as the cause of all causes, then there is no regress of explanations. This understanding of God is well matched by the idea of God as the creator of all there is ex nihilo. Krauss also says there is no evidence in support of the idea of God. That clam will be addressed in a separate paper.

Secondly, the claim that God exists necessarily has been criticized on the grounds that a God existing necessarily cannot but act necessarily including creating necessarily. This necessity excludes freedom from the act of creation and from what is created. This would contradict the freedom manifest in human living, including human inquiry. It would also contradict any idea of God creating freely. This well-known difficulty is noted by Ward [6,3]and by physicist and philosopher P. Davies, [16,231],[17,66] citing Ward. Davies sees this as a fatal difficulty for this idea of God but does not consider Ward's extensive answer to this difficulty in the last chapter of [6]. On this difficulty, help is also given by P. Laughlin, [18; 655]. A key point is what kind of 'necessity' is meant when God is said to be necessary. For example, did Aquinas intend 'logical necessity' when he spoke of God being necessary? Laughlin shows [18,655] from a close examination of Aquinas that this is not the case. Aquinas[19] concludes, 'from the divine will, therefore, an absolute necessity cannot be inferred. But only this excludes contingency.'

There is no answer I know of to (b): why is the universe structured and structured the way it is? A common view would be that the universe is structured according to the laws of physics. A possible entrée to answering (b) is to seek an explanation of the laws of physics. Two works seeking such an explanation are by Paul Davies, [17] and by Victor J. Stenger, [20]. Davies' approach makes information (Shannon information) ontologically basic and foundational for physics [17; 75]. Davies is seeking to derive the laws of physics from this informational starting point. This is still a promissory note, which may yet succeed. In the light of the above discussion, we can see that even if successful this approach to the laws of physics will not lead to a richer view of nature which includes both the logical space of subsumption under natural laws and the logical space of reasons.

Stenger starts by considering the kind of objectivity physicists seek in making models of reality. He illustrates this by contrasting the observations physicists make to observations

from a subjective point of view – like taking a photograph. "Instead, physicists seek universality [20,55]." This claim is supported by a brief sketch of science's history of increasing objectivity from Galileo to Einstein (chp.3). Stenger's key idea is, "[p]hysics is formulated in such a way to assure, as best as possible, that it does not depend on any particular point of view or reference frame. This key idea helps make possible, but does not guarantee, that physical models faithfully describe an objective reality, whatever it may be." [20;9,55]. Thus, a model [20,15], "should be able to successfully describe in a repeatable, testable fashion a whole class of observations of the same general type; enable the predictions of other unexpected observations; and provide a framework for further applications, such as in technology or medicine." From the principle of 'point-of-view-invariance' and some other assumptions and principles Stenger elegantly derives virtually all the laws of classical, relativistic and quantum physics (Mathematical supplements A to G). This is an impressive tour de force. Stenger is clear, "The principle of point-of-view-invariance … is an eminently testable, falsifiable principle. So far, it has not been falsified" [20,161]. For Stenger, nothing guarantees the agreement. The universe might have turned out to be otherwise. From the principle of 'point-of-view-invariance' and some other assumptions and principles Stenger elegantly derives virtually all the laws of classical, relativistic and quantum physics (Mathematical supplements A to G). This is an impressive tour de force. For Stenger, "The principle of point-of-view-invariance … is an eminently testable, falsifiable principle. So far, it has not been falsified" [20,161]. For Stenger, nothing guarantees the agreement. The universe might have turned out to be otherwise.

I want to connect Stenger's work with the preceding discussion drawing on Sellars and McDowell. Stenger is speaking about physicists as inquirers into an assumed objective reality which they attempt to model in a way that does not depend on any particular point of view. It turns out this leads to his deriving the laws of physics. This result show us how human inquirers situated in the logical space of reason with theoretical and empirical knowledge, with propositional attitudes (beliefs) and intentions (to make models of an assumed reality), can produce models of an assumed reality, such that the models replicate laws of nature. These are the laws of nature, which are presupposed in the logical space of explanation in terms of natural law.

From the standpoint of the answer to question (a), this account of human inquirers could be carefully thought of as reflecting what has occurred in the mind of God, the creator of all there is, the universe (or multiverse), who freely brings it into existence. It is a way of possibly beginning to link the answer to (a) why is there anything at all? and (b) why is the universe structured and structured the way it is? But so far, we lack a direct connection between Stenger's account of the laws of nature and God. Stenger is an atheist and so doesn't envisage any such link and doesn't think of his work as even suggesting such a link. We also would like an account of why God would create such a universe or indeed any universe. What would be God's purpose in creating? We would also like some insight into how does God create ex nihilo. These tasks sketch some of the work to be done in setting out a richer account of nature. In this argument nothing at the intersection of science, philosophy and theology involve a compromise of the natural science.

Conclusion

Daniel Dennett provides a large-scale narrative of the journey from bacteria to Bach, set within the still larger scientific cosmological narrative, which includes a multiverse. He aims to give an account of human life, including religion, within this setting. The problem with this project is that while it presents a scientific view of the world (and naturalistic worldview) it is not possible for it to include an adequate account of those who are constructing this remarkable view of the world. A richer view of nature is called for. But where to start? My argument is that there is a principle starting point within Dennett's vast narrative for an alternative view. The starting point is the practice of human inquiry – which resists being completely naturalised and so is understood as indicating something of what exists, that cannot be squeezed into a completely 'naturalistic' frame. A richer view of nature is called for. This richer view begins by drawing on a presupposition of human inquiry – that what is being inquired into is intelligible and open to rational explanation, without prejudice to the forms of intelligibility and rationality that may called for. Also guided by the relentless expansion of human inquiry that conducts itself as if it will never end, the general presupposition of the richer view of nature is that all there is fully intelligible. The presupposition leads to a still larger philosophical discussion answering two questions: (a) why there is anything at all? and (b) why is the universe structured and structured the way it is? Just a hint of how these questions might be answered and the answers linked comes into view using V.J. Stenger's derivation of the laws of physics.

Further work is needed on whether there is an argument from Stenger's work to God. A clue I intend to pursue is an apparent oddity. The principle of point-of-view invariance is a central premise in Stenger's derivations of the laws of physics. The apparent oddity is that the laws of physics which are operative in the universe from the earliest moment after the Big-Bang are rationally derived from something that only shows up in the universe billions of years later, that is scientific inquiry pursued by physicists guided by the principle of point-of-view invariance. If the oddity can be explained entirely within the resources of the natural sciences, then after all it is only an apparent oddity. If it logically cannot be so explained, then it would become an interesting oddity to be explored.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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