

THESE ULTIMATE SPRINGS AND PRINCIPLES: SCIENCE, RELIGION AND THE LIMITS OF REASON

RAYMOND AARON YOUNIS

Central Queensland University

Abstract. The question of the limits of reason, not just within philosophy but also in the modern sciences, is arguably more important than ever given numerous recent commentaries on “life”, “reality”, meaning, purpose, pointlessness and so on, emanating not from philosophers or metaphysicians, but rather from physicists and biologists such as Steven Weinberg and Richard Dawkins. It will be argued that such commentaries concerning the “pointlessness” of the universe, or the purpose of “life”, and other such things, are flawed and unconvincing, not least because they seem to overlook or forget a number of well known and significant philosophical contributions on the question of limits, particularly by Kant, but also by Hume, Russell and Sir A J Ayer.

A certain confusion, however, arose in science, which cannot determine how far reason is to be trusted, and why only so far and no farther; and this confusion can only be cleared up and all future relapses obviated by a formal determination, on principle, of the boundary of the use of our reason. . . .

We cannot indeed, beyond all possible experience, form a definite concept of what things in themselves may be. Yet we are not at liberty to abstain entirely from inquiring into them; for experience never satisfies reason fully but, in answering questions, refers us further and further back and leaves us dissatisfied with regard to their complete solution. . . .

Who can satisfy himself with mere empirical knowledge in all the cosmological questions of the duration and of the magnitude of the world, of freedom or of natural necessity, since every answer given on principles of experience begets a fresh question, which likewise requires its answer and thereby clearly shows the insufficiency of all physical modes of explanation to satisfy reason? Finally, who does not see in the thoroughgoing contingency and dependence of all his thoughts and assumptions on mere

principles of experience the impossibility of stopping there? (Kant, *Prolegomena*, pp. 99-101)

Many thinkers, from Socrates, Plato, Aristotle and the ancient skeptics to Kant, Hume, Russell and Ayer, have reflected memorably on the limits of reason. It is certainly not a new topic, though there remains much to consider. The ancient Pyrrhonists warned of the equipollence of competing claims or arguments and of the suspension of judgment in relation to such things; Socrates spoke of perplexity (see Mathews, 1999) and the nature of philosophy and Aristotle warned of *aporiai* in his *Metaphysics*. In modern philosophy, a rich vein of significant material, Hume and Kant, Russell and Ayer, provided profound reflections on the question of the limits of reason (and by extension, of empirical knowledge).

The question is arguably more important than ever given the recent upsurge in quite grandiose and sweeping claims about “reality”, “life”, meaning, purpose and so on, made not by enlightened metaphysicians, but by prominent scientists such as Steven Weinberg and Richard Dawkins, among others. It will be argued that these scientists’ positions concerning the “pointlessness” or purpose of the universe, or “life”, are flawed and unconvincing, not least because they seem to overlook or forget some significant philosophical contributions of the kind mentioned above, and particularly by Kant.

I.

Kant’s contributions to debates on the limits of reason, and by extension, of our knowledge of things, are well known. There is a considerable and significant body of literature too: for example, Forster discusses varieties of skepticism (2008); Hanna discusses human nature and freedom (2006); Waxman explores Kant and the empirical tradition (2005); Watkins (2005) and Ewing (1924) are concerned fundamentally with the problems of causality; Dickerson explores representation and its limits (2003); Campbell focuses on constructivism, epistemology and ethics (2002); Rescher explores the limits of philosophy (2000); Grier (2001) and Gardner (1999) examine Kant’s understanding of transcendental illusions; Llewelyn compares and contrasts Kant and Levinas with respect to ethics and the limits of freedom and duty (2000); Langton reflects on ignorance (1998); Strawson focuses on reason, limits and the task of philosophy (1989); Velkley (1989) stresses the limits of cognition; Peacocke (1989) and Gram (1984) focus on the transcendental aspect of Kant’s philosophy; Shell (1996) emphasizes the collapse of reason and the limits of autonomy (2009); Beiser focuses on

reason's questions about its authority (1987), and on the challenge to subjectivism (2002); Buchdahl explores reason and the structure of Kantian thinking (1992); Guyer (1987) and Prichard (1909) focus on epistemology; Beets discusses the Kantian analogies (1986); Friedman discusses reason and faith in Kant and Kierkegaard (1986); Bennett focuses on dialectical reasoning (1974); Vesey (1972) and Green (1997) discuss the Copernican Revolution in Kant's thought; Jalal discusses the antinomies of pure reason (1972); McFarland explores teleology (1970); Ewing (1967) discusses the impossibility of knowledge of the transcendent; Heidegger (1962) and Sellars (1968) discuss in very different ways the relation between Kant's thought and metaphysics;

This listing is not exhaustive either. It is, however, possible to go further, notwithstanding the value and significance of these studies. Kant himself in his *Critique of Pure Reason* (his other works are outside the scope of this paper) understood "limits" in several respects; a point that has not been noted with sufficient force or clarity. It might be useful to outline several of these respects at the outset.

First, he argued that reason "is called upon to consider questions which it cannot decline" but also "cannot answer" because these questions "transcend every faculty of the mind". What he meant is that reason employs principles, "the truth and sufficiency of which . . . are insured by experience"; these principles are then applied to "ever higher and more remote conditions", which lie beyond the limits of experience. (One might think here of the attempt through reason and these principles to discover the true nature of a transcendent being such as "God" or of a sphere of being which is genuinely or truly not subject to the conditions of space and time – if, of course, one grants for the purposes of argument that such things are ontologically possible).

There are in fact four aspects here in relation to limits, not one, though Kant does not make this point clearly. First, he wrote of a limit that applies to *reason generally* inasmuch as seeks to discover, so to speak, things that lie outside of the "sphere of its cognition"; second, he wrote of a limit that applies to *principles specifically*, which reason seeks to apply, so to speak, principles which are anchored in experience, in the sense that they are useful in the field of experience and in the sense that they are "insured" by experience, to things which we have no experience of, such as the universe as a whole, or genuinely and truly *transcendent* things (in Kant's understanding of that term); third, he wrote of the *manifestations* of overstepping such limits, so to speak, namely confusion, contradiction and error; and fourth,

he wrote, repeatedly, of the limit that applies to the attempted application of reason to *objects in general* that lie outside of the sphere of experience.

So, according to Kant, there are *objects* which lie beyond our reason, our cognition, our faculties *and* our experience, particularly in relation to what he called “the sphere of the supersensible” (1952, p. 8). This is, of course, one of the major reasons why he sought in the *Critique* to confine speculative reason “within its proper bounds” (1952, p. 9); to limit its bounds and therefore, remove the problems that “arise out of her own bosom” (1952, p.20). But elsewhere, he wrote also of the limits that apply to *conceptions* and of the principles that derive from them (1952, p. 10). He argued that our *theoretical cognition* is limited to “mere phenomena”, by which he meant, presumably, that we are unable through reason and the conceptions that it forms in its speculative functions, to attain “transcendent insight” – insight into the true nature of things in themselves which lie outside the sphere of our possible experience (that is, things in relation to which *experience* cannot offer sure guidance or comprehensive, true knowledge, according to Kant).

Intriguingly, he also linked the question of limits to the importance in the *Critique* of thoroughly investigating *dogmatism and its limits*. He understood dogmatism in terms of a *presumption*: that it is “possible to make . . . progress with a pure cognition, derived from (philosophical) conceptions, according to the principles which reason has long been in the habit of employing” (1952, p. 11). However, he pointed out that there is a preliminary task: inquiring “in what way and by what right reason has come into possession of these principles”. So, *dogmatism* is limited because it employs pure reason without a critique of the very “powers” that are employed in its procedures. This kind of searching, reflexive criticism is a necessary preparation, according to Kant, and it involves such things as clearly defined conceptions, demonstrations that withstand the “most severe scrutiny” and which avoid rashness or precipitousness (in the Pyrrhonist sense of that term) – in short, the “spirit of profound and thorough investigation” (a phrase that Kant repeats, significantly; 1952, pp. 11, 13)

He wrote of limits in other memorable and significant ways: first, he wrote of an inability to render complete our “edifice of cognitions” (1952, p. 148). This is the “architectonic limit”, one might say. He argued, as is well known, that human reason is by its very nature “architectonic”, which means that every cognition is regarded as part of an overall system. But the limit is introduced here by our discovery of antitheses or antinomies or *aporiai* (puzzles, enigmas or impasses, as Aristotle would have it) when we try and employ reason to give a comprehensive and true account of

whether or not the world had a beginning in time or whether or not all things are conditioned, and so on. In this context, our attempt to form an *a priori* unity (in terms of our cognitions as a whole), becomes difficult if not impossible (Kant's position here is unforgettably clear, if not compelling: it is "utterly impossible", 1952, p.149).

Crucially, he distinguished between "bounds" and "limits": "in all bounds there is something positive (for example, a surface is the boundary of corporeal space . . .) . . . but limits contain mere negations" (1950, p. 103). He added:

Human reason admits of limits but not of bounds, namely, it admits that something indeed lies without it, at which it can never arrive, but not that it will at any point find completion in its internal progress . . . Natural science will never reveal to us the internal constitution of things, . . . Reason through all its concepts and laws of the understanding which are sufficient to it for empirical use, that is within the sensible world, finds in it no satisfaction, because ever recurring questions deprive us of all hope of their complete solution . . . (1950, pp. 100-101)

If Kant is correct and reason, for example, as a faculty, has limits but not bounds, that is, reason allows us to provide *some explanations* but not *complete* ones or a "complete solution", for instance, to the problems of cosmology and cosmogony, then it would follow that natural science, inasmuch as it draws upon or is based on reason, would not be able to furnish complete explanations

Finally he linked the question of limits to the question of comprehensive, true knowledge. His position again is fairly clear: our perceptions are subject to conditions; if this is true, we cannot arrive at a comprehensive (and true) understanding of things (*through perception*) – assuming for the purposes of argument that such as these exist – that are *unconditioned*. He realized that this argument has important implications in relation to explanations or more broadly to the explanatory function of our knowledge, especially in the theoretical sphere. His position suggests that if there are in fact things or objects which we cannot perceive, or which are not subject to those conditions which make our perception possible, then a comprehensive and true explanation of the whole is not an object of experience but rather the object of a transcendental problematic (wherein the limits of reason and of dogmatism would need to be set out systematically, wherever possible). This aspect of Kant's work has important implications of course, but is outside the scope of this paper; in what follows it will be argued that several other aspects of Kant's work on the limits of reason, augmented by

the work of Hume, Russell and Ayer on the *limits of empirical knowledge*, need to be recalled again, in relation to a number of arguments that have emerged in recent times in the physical and human sciences concerning purpose and “life”.

II.

Hume, as Kant was well aware, provided one of the most memorable accounts of such “limits” in his *Treatise of Human Nature*:

We speak not strictly and philosophically when we talk of the combat of passion and reason. Reason is, and ought only to be *the slave* of the passions, and can never pretend to any other office than *to serve and obey* them... (II.iii.3, pp. 414-15)

It is significant that Hume, strictly speaking, found talk of the conflict between reason and passion problematic. He found it problematic because he believed that passion is more powerful, by which is intended, in the words of Ayer, a “rhetorical [one might say “passionate”!] way of making the point that the ends of our actions are determined by our desires” (1972, p. 123), or put in an amplified way, our “passions”.

This is not the place to critically assess the literature surrounding Hume’s argument but it is important to note that it does harmonize with Kant’s work in one very important respect, at least: it emphasizes another limit of reason, inasmuch as it conflicts with “passion”, and inasmuch as desire determines the ends that we choose. In this sense, rhetorically de-amplified, reason is a “slave” and its two functions are to “serve” and “obey”; this presumably would strike Hume as more strictly and *philosophically* accurate. In another sense, Hume seems to be sounding a warning about not *understanding properly* the nature, function and scope of “reason” as a faculty or capacity; about *employing it correctly*, another point of emphasis that anticipates and in fact, harmonizes with, Kant’s conception of the *Critique* as a corrective in relation to the extent to which reason oversteps its limits.

In short, and Kant may have known this, Hume’s work highlights no less than five “limits” to “reason”: an inability *to explain* the *ultimate cause* of the impressions that we get through the senses; an inability *to know* (that is, with certainty) whether *impressions* arise from external things (“objects”), the “creative power of the mind” or the “author of our being”; an inability *to give* a “reason for our most general and most refined principles, *beside our experience* of their reality” (*Treatise*, Introduction, #9); an inability *to*

discover the causes of general laws (derived from observation or from our experience of numerous effects, or from reasoning by analogy) –

But as to the *causes of these general laws*, we should in vain attempt their discovery; nor shall we ever be able to satisfy ourselves, by any particular explication of them. These *ultimate springs and principles* are totally shut up from human curiosity and enquiry . . .” (Enquiry Concerning Human Understanding, section 4, part 1, parag. 12, p. 45)

The fifth “limit” concerns an impasse: the “ultimate springs and principles”, according to Hume, remain inaccessible to reason (and more broadly, “enquiry”), presumably because “ultimate” things are, as Kant would say, beyond the sphere of possible experience (at the very least, as far as *we* can tell). The question of whether or not these *springs and principles* (note the connection here, in passing, between Hume’s work on *principles* that are not accessible and Kant’s work on *principles* that cannot be extended to the sphere of the unconditioned) are *totally* shut up, *strictly and philosophically*, it must be said, is debatable, for Hume, *strictly and philosophically*, does not and arguably cannot show that they are and will remain *totally shut up* in this kind of way. However, this objection does not invalidate Hume’s general argument concerning the limits of the “particular explications” that we attempt or the limits of human enquiry into “ultimate” things, or for that matter the limits of our experience of reality, in the broadest sense.

III.

Russell and Ayer, both of whom were, of course, profoundly influenced by Hume, also made important contributions in this field and in these contexts, though these contributions are somewhat under-researched. Three further examples of limits, at least, are found in their work: Russell wrote of the absence of “positive knowledge” and of what we know in relation to, or in association with, observers; Ayer argued that there is a circularity in our rational methods, or at least, that our procedures are question begging.

Russell reminds us that there is a great deal that we do not know about the world or nature as a whole (even though he was writing in 1948 and 1961):

Physics is mathematical not because we know so much about the physical world but because we know so little: it is only its mathematical properties that we can discover. For the rest our knowledge is negative . . . *We cannot find out what the world looks like from a place where there is nobody*, because if we

go to look there will be somebody there; the attempt is as hopeless as trying to jump on one's own shadow . . ." (1961, pp. 163-164)

This is an important point. What is implied is that we make connections between parts of the physical world, which we do know, and parts, which we do not know, and quite conceivably cannot, know completely (to return to Kant and Hume for a moment). Analogy or inductive inference helps us to bridge such gaps; complete certainty cannot be attained. (It is debatable whether or not non-mathematical knowledge is "negative" but this debate is outside of the scope of this paper.) Russell suggests, quite sensibly, that our observations are also limited and therefore that those parts of the physical world that we cannot observe cannot be spoken of with complete certainty so long as analogy and induction are the bridging devices in our explanatory systems or rational procedures. It is interesting to note that modern physics with its current emphasis on dark energy and dark matter, in particular, largely harmonizes with Russell's striking claim concerning how little we know. It is debatable, again strictly and philosophically speaking, whether or not we can *only discover* the physical world's *mathematical properties*, but this debate is outside the scope of this paper. At any rate, even if Russell turned out to be wrong about this, his point about the limits of some, if not all, of the rational methods that we employ in our quest for true knowledge and understanding of the physical world, would not be invalidated.

Ayer extends this kind of analysis further. Not only are our models, in one sense at least, and our observations limited, but our use of induction is also limited.

In calling such inferences reasonable, we do not mean to claim that they are demonstrative. What we mean, when we say that we have good reason to believe a proposition, which is not formally demonstrable, is . . . simply that it is supported by strong inductive evidence, or, in other words, that it accords with our past experience. And if this is so there is no sense in asking whether the accepted general procedure of arguing from observed to unobserved cases is itself reasonable; for in the application of the criteria by which we determine what is reasonable the validity of this procedure is already presupposed (1971, pp. 190-191)

The *accepted general procedure*, which allows us to proceed from what has been observed to what has not been observed, is useful, perhaps even necessary, but clearly limited, inasmuch as it requires those things that have been observed; this much is nothing new.

But it is limited in another significant way, as Ayer pointed out: if we wish to establish that something is reasonable, for example, a proposition, we apply an *accepted general procedure*; if someone asks if this procedure is reasonable, we can point out that the application of the criteria, which allow us to determine whether or not something is reasonable, presupposes the validity of the procedure itself. In this context, Ayer's sense of the limit of inductive inferences becomes clearer: we can say that something accords with our past experience or that there is good inductive evidence for it; and that our inferences on that basis are reasonable; but we cannot argue validly or truly at the same time that our inferences are *demonstrative*.

Ayer developed this theme in a number of works, though, once again, it remains under-researched (and a further, critical exploration of its central thrust will have to wait for another time). It is clearly of some importance in debates not only about inference and induction, but also about the formation or articulation of theories and explanations, and by extension, in debates about the comprehensive, true knowledge, if any, that natural science provides in relation to the physical world as a whole. For example, in a later work, Ayer argues:

admittedly there is *a circularity in our procedure*. The special theories which we hold about the behavior of physical objects presuppose the validity of the general principles which enter into our conception of those objects, such principles as that they are accessible to different senses and to different observers, and that they are capable of existing unperceived; but equally these principles are themselves consolidated by the success of the theories which presuppose them . . . We cannot stand in the void, and there is nothing exterior to our system by which it could be justified . . . (1990, p. 137)

IV.

What then of the significance of such work, by Kant in particular, but also by Hume, Russell and Ayer, in relation to some fairly grandiose claims about the universe and "life" in recent times in the physical and human sciences, and more particularly by Steven Weinberg, who argues that the discoveries of modern physics reinforce the sense that the universe seems "pointless", and Richard Dawkins, who argues that evolution *explains* "life" and *as a whole*?

Weinberg has famously argued that the "more the universe seems comprehensible, the more it also seems pointless" (1988 quoted in Glanz, 2000 and Koupelis and Kuhn, 2007, p. 551) He also argued:

[though] aware that there is nothing in the universe that suggests any purpose for humanity, one way that we can find a purpose is to study the universe *by the methods of science*, without consoling ourselves with fairy tales about its future, or about our own . . .” (Overbye, 2002)

If Weinberg is aware of those limits to reason and enquiry set out by Kant, in particular, but also by Hume, Ayer and Russell, he does not say so. Weinberg’s argument deserves careful scrutiny, for though it sounds memorable and persuasive, it is flawed.

First of all, if one grants that there is, in fact, *nothing in the universe that suggests any purpose for humanity*, it would not follow that there is, *in fact, no purpose for humanity*. Weinberg’s argument is fallacious. Even *if there is no evidence in the universe to suggest that there is* a “purpose for humanity” (the phrase is ambiguous and vague, but this is a problem that shall be put to one side for the time being), he cannot logically infer the non-existence of any kind of purpose for humanity. This latter objection would be strengthened further if Russell is right and we do in fact know very little about the universe as a whole. Weinberg then, seems to be arguing from ignorance.

So, there are at least four problems that would need to be overcome before Weinberg’s argument can be salvaged: first, the claim that *there is nothing in the universe that suggests any purpose for humanity* is ambiguous: it might mean “nothing in fact”, or it might mean “nothing that we have discovered” or “nothing that we can discover”; and it is neither clear what would count as *purpose for humanity* nor is it clear what would count as *evidence* for such a thing in the universe itself. A Kantian critique would emphasise, validly, that “purpose” of this (overarching?) kind is not an object of experience and is certainly not an object of perception or observation.

Second, the claim that *there is nothing in the universe that suggests any purpose for humanity* is itself unconvincing, precisely because much of what we know about the universe at the subatomic level is probabilistic, not certain, and precisely because, as Russell reminds us, we know so little about the universe as a whole (on one conservative estimate, about 97% of the universe remains unobserved! If this is so, the sample that Weinberg is extending the range of evidence to would seem to be very small indeed!). Strictly and philosophically, to invoke Hume again, Weinberg’s claim should be modified to make clear how much we do not know about the universe; how much we grasp about it in terms of statistical probabilities; how much room for uncertainty therefore remains; how much remains to

be discovered about it; how much is subject to *a priori* principles and the extension of the principles of pure reason beyond their proper sphere; and how Kant's work had already prepared us for some of these objections over 120 years ago.

Third, even if one grants for the purpose of argument that the evidence in the universe does not *suggest any purpose for humanity*, it would not follow that there is, in fact, no *purpose for humanity*. The connection between the "evidence" and "purpose" remains obscure: it is not clear what sort of evidence would suffice to establish whether or not *purpose for humanity* exists, especially since Kant and Hume, among others, would take *purpose for humanity*, particularly in the sense of "purpose" which is *genuinely and literally universal*, as something that belongs to the order of the *transcendent* (in the Kantian sense) or to the order of *ultimate springs and principles* (in the Humean sense) – and neither order would in any evident or clear way escape the limits already elaborated upon by these philosophers.

Weinberg seems to believe that what we have learned about the universe to this point allied with the *expectation* that we will learn *more in this vein*, justify confident conclusions about the *pointlessness* or otherwise of *the whole*. It is important to note that Weinberg presents what looks like negative knowledge: "there is nothing in the universe that suggests any purpose for humanity". He not only concludes that there *is no purpose* for humanity (in the grand teleological or ontological sense, presumably) in the universe, but also suggests that *religious accounts of purpose* in the universe, though they offer possible sources of consolation, are not defensible – at least not more so than "fairy tales".

It would seem that Weinberg is arguing that "science" (this term is also a little ambiguous, but presumably Weinberg understands "science" in terms of some analogy with physics *as a science*, though it is not easy to tell just what the clear sense is) is sufficient to refute religious accounts of purpose (which, in turn, are bound by analogy, by implication, to "fairy tales". Such an analogy raises numerous problems though they remain outside the immediate scope of this paper.) But this kind of argument too, is problematic and for at least 3 reasons: first, it implicitly overlooks or ignores (again) the Kantian and Humean emphases on the limits of human enquiry *and* reason. Both Kant and Hume would argue that the universe (as a whole) is either not something that we can observe or not something that can be an object of our experience. It is important for Weinberg to address these arguments carefully and thoroughly if his own broader argument concerning science – presumably *empirical* science is what he has in mind

– and the knowledge that it has produced about the universe as a whole, is to be convincing or compelling.

Moreover, Weinberg would need to show how such sweeping claims about non-evidence and *purpose for humanity* are *not* subject to the dialectic of pure reason, as Kant understood it in *Critique of Pure Reason*, with its emphasis on *inferred concepts* (for example, of the *universe* or of *nature* as a purposeful or purposeless *whole*), *the object of which cannot be given empirically*.

Richard Dawkins argues in *The God Delusion* that the theory of natural selection furnishes a theory of “life” (presumably in its broad sense, though the vagueness is part of the initial problem here, but more of this in a moment). Dawkins seems to be arguing that we begin with a “theory” which allows us to explain how some living things (which we have observed) evolve through adaptation, mutation and “selection”, and then we arrive (somehow!) at an explanation of how *all* living things, including those that we have not, and cannot possibly, observe (for example in the distant future), evolve. Dawkins does not address Hume’s argument that it is a *presumption* that allows us to affirm that the events of the past will continue to resemble the events of the future, just as Dawkins does not address Hume’s important work on the limits of some of our rational procedures.

And one can go further: Dawkins seems to suggest that this “theory” will also allow us to explain, accurately and comprehensively, *all* “life” – which means, presumably again, where it came from, what it is, how it develops and where it is heading (if this kind of talk makes any logical or empirical sense at all, and if it does not lead to paralogisms, antinomies or contradiction, in the Kantian senses of these terms). Such a position cannot deliver certainty – it is inductive though it does not escape Hume’s and Ayer’s well-made points about this kind of procedure. Moreover, the available evidence is not sufficient, strictly speaking, to justify such sweeping generalizations about *life* as a whole or nature in its totality, for such things, as Kant and Hume remind us, are outside the range of our experience. As an *explanation, strictly and philosophically*, Dawkins’ “theory” of “life”, taken literally, would be neither verifiable nor refutable *as such*, in empirical terms. On this basis, one would wonder with some logical *and* empirical justification, just how much factual content it has at all, just how many presumptions and how much speculation gives it shape or form.

It is questionable, to say the least, to affirm – without clear justification one might add and with questionable presumptions – some empirical con-

nection between *some living things* and “life” as a whole or between some living things and *nature as a whole* – or for that matter between actually existing things, as we know them, and some ambiguous, overarching concept such as “life” now *and* in the future. This point is reinforced by the failure of Dawkins to explain clearly and convincingly how a category that can be applied to some things now can be applied to all things (that were alive, that are alive or that will be alive, in some sense, in the future). How many observations will it take for the position to be established? Well, those who are familiar with the logic of induction and its limits will answer decisively: it will only take one counter-observation to challenge the whole edifice and conceivably, generate antinomies, paralogsms or contradiction – all, as Kant pointed out long ago, manifestations of reason over-stepping its limits.

Kant, in his attempt to provide a solution to the “transcendental problems” of pure reason, argues that phenomena “require and admit of explanation, only in so far as the conditions of their explanation are given in perception” (1952, p. 151), and that wholes, in the “empirical signification of the term” (p. 151), are always “comparative”; that is to say, they lie beyond the range of our possible experience and our experience cannot provide a demonstrative guide. It is not at all clear that *all of the conditions, or the conditions generally, that govern “life”* as a whole are “given” to human perception (in the sense of being accessible to, or being common to, human perception), nor is it clear that the conditions that govern the *explanation* of wholes (such as “life”) are “given” to human perception. Dawkins’s position seems to presuppose that the conditions of the explanation of “life” (as a whole) are “given” to human perception – inasmuch as human perception informs observation and inasmuch as human perception and observation inform the evolutionary theory of “life” as a whole. If this is correct, then Dawkins would need to explain in what sense these connections evade or overcome Kantian objections based on his analysis of the limits of reason.

V.

It would seem that Kant was correct to a significant degree. There is some evidence to support this claim, quoted in the epigraph:

We cannot indeed, beyond all possible experience, form a definite concept of what things in themselves may be. Yet we are not at liberty to abstain entirely from inquiring into them; for experience never satisfies reason fully but, in an-

swering questions, refers us further and further back and leaves us dissatisfied with regard to their complete solution...

It is evident that the arguments of Weinberg and Dawkins cannot give us a *definite and clear concept* of what the universe or “reality” in itself, as Kant might say, *is*, that is to say, as a whole that exists independently of our observations, theories, experience, cognitions and sensibility. Kant may very well be right about our not being “at liberty to abstain entirely” from inquiring into the nature of such things too, if Weinberg and Dawkins can serve as representative examples. The explanations given by Weinberg and Dawkins, inasmuch as they derive from experience, do not satisfy reason fully, in the sense that they do not furnish comprehensive or convincing answers to the sorts of questions that have been asked in the course of this essay. In answering questions about the “reality” of the world or about the “pointlessness”, or otherwise, of the universe, it would seem also that Kant is correct about the claim that these accounts (since they generate further questions and objections) refer us “further back”; they certainly seem to be less than satisfactory with regard to a “complete solution”, in Kant’s words, in the sense that it is difficult to see, as things stand now, how such accounts can overcome many if not all of the objections, and problems, that have arisen.

Kant also seems to be correct on two other points:

every answer given on principles of experience begets a fresh question, which likewise requires its answer and thereby clearly shows the insufficiency of all physical modes of explanation to satisfy reason. Finally, who does not see in the thoroughgoing contingency and dependence of all his thoughts and assumptions on mere principles of experience the impossibility of stopping there?

The claims of Weinberg and Dawkins, for example, concerning “life” or “pointlessness”, *in truth*, inasmuch as they exemplify “physical modes of explanation”, also serve to highlight the extent to which reason fails to be satisfied, in the sense of a lack of a “complete solution” to the questions that arise *as a consequence of the content of such modes of explanation*. It is not difficult to see signs of contingency and dependence either in their thoughts and assumptions – for example, in the context of “theories” (which are incomplete, inconclusive or subject to statistical probabilities) or questionable assumptions about the links between some parts and the whole – with regard to “mere principles of experience”.

It would seem that Hume is also correct, to a significant degree. It is difficult to see how one might speak *truly* and *conclusively* of “pointlessness” in the universe without in some sense commanding an understanding of

the “causes of [those] . . . general laws” or of their absence – causes which, according to Hume, we vainly attempt to discover. Of course, it is difficult to show that all such attempts are vain, without using the kind of reasoning that one finds problematic in some ways in the arguments put by Weinberg and Dawkins (that is, forms of inductive reasoning), but Hume’s point is an important one inasmuch as it highlights the extent to which the arguments go well beyond the *available* evidence.

Hume also seems to be correct on this point: we cannot find (empirical or rational) satisfaction *by any particular explication* of the causes of those general laws, for example, in the arguments mounted by Weinberg and Dawkins, for Weinberg gives no convincing, unified account of the causes of the general laws that pertain in the physical universe at the macro and quantum levels, and Dawkins does not give a convincing “explication” of the *ultimate springs and principles* from which evolution by natural selection derives (if there are such things, Hume might have added), if it is a process that is caused.

Finally, it would seem that Russell and Ayer are also correct, in an important sense: the arguments mounted by Weinberg and Dawkins entail, in part, it would seem, a view of what “reality” or “life” or the universe *look like from a place where there is nobody* to observe them or to appeal to experience, or from *the void*, that is to say, where no human observation or cognition, presumably, is possible. These kinds of limits do raise important questions, as Russell and Ayer realized, for how can one *know* conclusively or demonstrably that such a view is true if there are no observers or participants to confirm or verify the claims that are made and the arguments that are preferred, or to go further, if Hume and Kant are correct, if there is no possibility of such observation, participation or experience? There is indeed much scope here for further research, reflection and debate.

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