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Intelligibility All the Way Down: Interpreting Nagel's *Mind and Cosmos*.

Thomas Nagel's *Mind and Cosmos* is, to date, his most recent philosophical monograph.¹ It has also proved to be his most controversial as Nagel was dragged into America's culture wars over the respective roles to be played in intellectual life between the claims of scientific belief and of religious faith. Yet, as I will demonstrate in this paper, this book is simply the latest development of an anti-reductionism that has been present, as a leitmotif, in Nagel's oeuvre over a forty-year period. So those scandalized by the book are a little late to the party. I will outline the main claims of the book and trace their continuity with earlier themes in Nagel's work before assessing their philosophical merits.

The Continuity of Nagel's Arguments

The arguments of *Mind and Cosmos* are clearly a continuation of some of the central themes of Nagel's earlier work, particularly as expressed in the most comprehensive presentation of his philosophical outlook in *The View from Nowhere*². In *Mind and Cosmos* Nagel's argument opens with the claim that there is an ineradicable tension between two forms of our self-understanding that appears most vividly in the restricted case of the mental/physical problem (this claim is also made in *The View from Nowhere*). But while this particular example of « placing » mentality in the physical world is where the tension appears most strikingly, the ramifications of the problem are far wider. Solving the problem involves a radical change in our self-understanding. So the later book represents a development in Nagel's thought as he works through what this change involves:

« [A] true appreciation of the difficulty of the problem must eventually change our conception of the place of the physical sciences in describing the natural order³. »

What do I mean here when I refer to « two forms of self-understanding »? First, that we think of ourselves as conscious subjects who have a rational nature and who engage with value; second, we also think of ourselves as part of the natural

¹ T. Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False*, Oxford: Oxford University Press, 2012.

² T. Nagel, *The View from Nowhere*, Oxford, Oxford University Press, 1986.

³ T. Nagel, *Mind and Cosmos*, p. 3.

order. By « the natural order » is meant, in turn, a conception of nature – viewed as a totality – whose existence is independent of us and which we claim to know via different forms of understanding including that exemplified by the sciences.

Nagel believes that a tension arises because, at the level of reflection, we have two sets of irreconcilable commitments: that to which we seem committed when we explain mentality seems to be ruled out by a conception of ourselves as part of the natural order *as* that latter idea has been developed by the physical sciences. (That is, given the contingent historical pathway of their development – this point will prove important to what follows.) Nagel's implication seems to be that science has been set on the wrong path by philosophers' commentary on its content and implications. Early in the book Nagel identifies his target as a certain philosophical view and not a scientific one:

« [A] comprehensive, speculative world picture that is reached by extrapolation from some of the discoveries of biology, chemistry and physics – a particular naturalistic *Weltanschauung* that postulates a hierarchical relation among the subjects of those sciences, and the completeness in principle of an explanation of everything in the universe through their unification⁴. »

So Nagel is not describing current physics. It is – notoriously – not even internally unified. Nor is he simply defining « science » by iterating a list of disciplines whereby physical science is conjoined to all the other non-special and special sciences (however the line is drawn between those two classes). He is, rather, describing a philosophical view – hence the word « speculative » – that « extrapolates » from the success of the core sciences to a comprehensive philosophical naturalism that is also committed to the positivist project of explanatory completeness and unification by explanatory reduction.

It is important to what follows that Nagel's own view is also, ultimately, a form of philosophical naturalism; unfortunately, « naturalism » is one of the most protean terms in recent philosophy. It is also true that the view that Nagel describes as reductionist naturalism does not understand itself to be reductionist – its proponents take it to be the one true naturalism. However, Nagel is not alone in identifying a view of this kind – in *Mind and World*, John McDowell calls the view

⁴ T. Nagel, *Mind and Cosmos*, p. 4.

that Nagel targets by the name of « bald naturalism »⁵. So, for convenience, I will refer to Nagel's view as « naturalism » and a view that he rejects « reductionist naturalism » even if its proponents would reject that characterization of their view.

Nagel further conjoins reductionist naturalism to an epistemological project envisioned by the Vienna Circle in the guise of the *International Encyclopedia of Unified Science*. That project is the unification of all the sciences via reductive bridging laws. So, once again, Nagel is not critiquing any of the results of the physical sciences, but a philosophical view that is extrapolated from them:

« [S]uch a world view is not a necessary condition of the practice of any of those sciences ... most practicing scientists may have no opinion about the overarching cosmological questions to which this materialist reductionism provides an answer⁶. »

This echoes Nagel's earlier critique of a view that he called « physicalism » in *The View from Nowhere*: a critique grounded on his radical realism. Radical realism is the view that not only is our current understanding of the world fallible – something most philosophers would admit – but that future conceptions of the world might have the feature that we could not, now, understand them. To understand them now, we would have to have completed an iterated sequence of understandings of the world – from « here and now » to « then and there ». Nagel is sceptical that this ambition could be realized.

He believes that our current form of scientific understanding, then, is inherently limited. Nagel does not mean by this that, given our current methods, there are things we *do* not know – that is platitudinous. Rather, our current methods have necessary, not contingent, limitations: there are some things we *cannot* know relative to our current understanding. That is, however, no reason to cut reality down to our size by drawing a principled connection between the knowable and the real that ensures that the latter cannot outstrip the former. In *The View from Nowhere*, the physicalist, like the idealist, is accused of cutting reality down to size: of privileging one form of description of the world that

⁵ J. McDowell, *Mind and World*, Cambridge, MA, Harvard University Press, 1994, p. xvii, ff.

⁶ T. Nagel, *Mind and Cosmos*, p. 4.

aspires to be both comprehensive and complete. Nagel thinks, once again, that this ambition cannot be realized. His radical realism is the true form of realism and one that runs against a counter-current of idealism that Nagel detects in the work of Wittgenstein and Davidson – as well as the misguided view of the physicalist.⁷

In order to begin to make the case for an alternative to reductionist naturalism, Nagel proposes a transcendental argument that begins from an assumption shared with the scientific enterprise: that the world is rationally intelligible – all the way down. This places Nagel, as he confesses, in the tradition of the « objective idealism » of Plato, Schelling and Hegel: an underlying order to experience is postulated to make a superficial phenomenon intelligible. To admit that our explanations have hit bedrock is, for Nagel, a failure and ought to be re-interpreted as a counsel to dig deeper⁸. There is always a deeper intelligibility conferring explanation to be found; if we cannot find one, that is a contingent limitation on our (current) abilities. We are in a world not of our own making that exists anyway; if we fail to make sense of part of it, that reflects the necessary limitations of the current state of our understanding.

From Nagel's rationalist perspective, as expressed in *Mind and Cosmos*, merely identifying the cause of a phenomenon is not enough; nor are correlations between distinct phenomena. We seek explanations and to explain is to bring events under some description or other. Those descriptions introduces an element of generality that is, for Nagel, part and parcel of any explanation⁹. This is the basis of his claim that there would be a « double involvement » of mind in the natural order in the renovated worldview that it is the task of *Mind and Cosmos* to make plausible to us:

« The intelligibility of the world is no accident. Mind, in this view, is doubly related to the natural order. Nature is such as to give rise to conscious beings with minds; and it is such as to be comprehensible to such beings. Ultimately, therefore, such beings should be comprehensible to themselves. And these are fundamental features of the universe, not byproducts of contingent developments whose true explanation is given in terms that do not make reference to mind¹⁰. »

⁷ T. Nagel, *View from Nowhere*, pp. 97, pp. 105–109.

⁸ While accepting that, metaphysically, “all explanations come to an end somewhere”. T. Nagel, *Mind and Cosmos*, p. 22.

⁹ T. Nagel, *Mind and Cosmos*, p. 47.

¹⁰ T. Nagel, *Mind and Cosmos*, p. 17.

For Nagel, the hybris of the reductionist is the claim that the reductive naturalist world picture, which excludes the mental *ab initio*, suffices reflexively to explain its own generation and acceptance by conscious subjects with reason. The reductive naturalist can give us no reason to believe her own view since the very idea of « reasons for belief » does not feature in her austere ontology.¹¹

For the reductionist naturalist, her position suffers merely from the defect of incompleteness: we are already in a position to state, now, that « mentalistic, teleological, or evaluative intelligibility ... have been left behind for good as fundamental forms of understanding¹² ». By contrast, Nagel asks us to envisage what a conception of explanation might look like that kept these alternative forms of intelligibility in play – that make « mind, meaning, and value as fundamental as matter and space-time in an account of what there is¹³ ». In envisaging such an alternative Nagel argues that we need to re-conceive of the sciences of life in such a way that they can be integrated into a reflective account of the world and our place in it as conscious, rational, persons such that it is highly probable that a temporal process could have led to the evolution of minds like ours.

Now the constraints of Nagel's commitment to panpsychism intrude on the argument in a way I will explain below: because he is a panpsychist, Nagel believes that we cannot understand mentality as having emerged from the fundamentally non-mental. It can have arisen as a development only from that which was « proto-mental » – a Nagelian term of art that I will explain below. (He also uses the phrase « proto-psychic » to refer to the same properties.) Having given grounds for rejecting theistic and materialistic explanations of this development, Nagel feels compelled to give an explanation based in the complexity of the natural order itself.

So in his non-reductionist naturalism, we have to assume that some of the basic laws of working of the universe are teleological in form and do not all take the form of mechanistic causal laws. That which the Dutch historian of science Eduard Jan Dijksterhuis called the « mechanization of the world picture » has been mistakenly over-generalised: some causal processes may only be constitutively

¹¹ For an argument that parallels Nagel's see L. Rudder Baker, *Saving Belief: A Critique of Physicalism*, Princeton University Press 1989.

¹² T. Nagel, *Mind and Cosmos*, p. 20.

¹³ T. Nagel, *Mind and Cosmos*, p. 20.

understood in terms of the end state that they seek (metaphorically) to realise »¹⁴. Mentality, or proto-mentality, must be built into our understanding of the universe and its workings at the ground floor: its most fundamental laws of working must include the capacity to explain how proto-mentality led to mentality in the guise in which it is exemplified in us. As Nagel puts it in a striking metaphor, at some point the non-mental universe « woke up ». He seeks a non-reductionist, non-materialist, explanation of how that could be possible that makes it intelligible that such an occurrence would be a probable development in the workings of nature. He thinks the only way in which that is possible is by postulating some fundamental laws of nature that are teleological in form.

Saving the Data

At some point in the history of the universe sentient and conscious beings came into existence; from our vantage point in history we are witness to the evolution of a species in which we instantiate a capacity for reason that is reflectively applied to understanding that evolution itself. For a rationalist like Nagel, reason gives us privileged insight into the truths of reason, and given his other philosophical commitments he has always believed that ethics and mathematics are paradigms of objective knowledge that also have a rationalist basis. Reason also, as he argues in both *The Last Word* and *Mind and Cosmos*, gives us a direct and unmediated access to certain truth of reason that are plausibly to be interpreted as a priori¹⁵.

Furthermore, we can reflect on the operations of our mind itself and see that we face, to borrow David Chalmers's expression, a « hard » problem of consciousness that suffices to show the falsity of psycho-physical reductionism about the mental¹⁶. Such reductionism neither therapeutically dissolves the hard problem; nor does it explain it away. Hence the persistent sense that the reductionist has redefined the problem of placing mental properties in the physical world to make it “easy” – that means, in effect, soluble to her own

¹⁴ E. J. Dijksterhuis, *The Mechanisation of the World Picture*, Princeton University Press, 1961.

¹⁵ T. Nagel, *The Last Word*, Oxford, Oxford University Press, 1997. T. Nagel, *Mind and Cosmos*, pp. 79–81.

¹⁶ D. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory*, Oxford, Oxford University Press, 1996.

satisfaction, but to no-one else's. As always in Nagel's philosophy, we begin from forms of objective knowledge, and capacities that find their expression in them, and seek a reflective account of our place in the world that is non-revisionary towards both. In that loose sense, of beginning from a minimally theorised conception of the world and our place in it, Nagel is a phenomenologist¹⁷.

Mind and Cosmos is replete with subtle discussions of the phenomenological data to be derived from experience of consciousness, rationality and engagement with value. Each of Nagel's separate discussions is of interest in its own right. Individual chapters of the book are devoted to consciousness, cognition and value, interwoven with the exposition of Nagel's central argument. In each case, Nagel rejects a reductionist account of the form of knowledge in question.

In these characterisations of the data of our experience it is the problem of consciousness that plays the most important role in Nagel's overall conception. He is, after all, seeking a speculative metaphysical foundation for the sciences of life in this book. The inadequacy of the views that he criticises seems to him most evident in the case of the mental/physical relation. It is his solution to that problem – the case of neutral monism – that explains a great deal else about the arguments of *Mind and Cosmos*.

Nevertheless, Nagel does distinguish the challenges that each of the three problems poses for the reductionist as that carries over to the problem facing the anti-reductionist naturalist as she constructs her alternative explanations. Nagel seeks explanations that address two kinds of questions: one constitutive and one historical that he distinguishes as follows:

« An ahistorical constitutive account of how certain complex physical systems are also mental, and a historical account of how such systems arose in the universe from its beginnings¹⁸. »

Nagel is sensitive to how these two different problems may place different constraints on their solution. Take the case of consciousness: given his repeated rejection of emergentist explanations, his explanation will be « reductive » in his

¹⁷ M. Ratcliffe, « Husserl and Nagel on Subjectivity and the Limits of Physical Objectivity » *Continental Philosophy Review*, vol. 35, no.4, pp. 353–377, 2002.

¹⁸ T. Nagel, *Mind and Cosmos*, p. 54.

own sense of that term. That is what drives him towards panpsychism; but if that adequately answers the constitutive problem, Nagel doubts that it can be an answer to the second, historical, question.

« [I]t is not clear that this kind of reductive explanation could really render the result intelligible ... The protopsychic properties of all matter, on this view, are postulated solely because they are needed to explain the appearance of consciousness at high levels of organic complexity. Apart from that, nothing is known about them: they are completely indescribable and have no predictable local effects, in contrast to the physical properties of electrons and protons, which allow them to be detected individually.¹⁹ »

Nagel is also troubled by how we are even to understand how « proto-mental » properties can be spatially locatable. But that is not the real problem, as frankly acknowledged in this paragraph: given that we know nothing about the intrinsic nature of protopsychic properties it is difficult to envisage the historical counterpart to the constitutive explanation of conscious mentality.

Further sensitivity to the difference between the problems emerges when Nagel turns to the nature of rational cognition. Here, some kind of holism seems to him inescapable, and any constitutive account given in terms of more basic elements does not come close to offering a satisfactory explanation of rationality: as he notes « just as consciousness cannot be explained as a mere extension or complication of physical evolution, so reason cannot be explained as a mere extension or complication of consciousness²⁰. »

Nagel believes that the same two questions – constitutive and historical – emerge in connection with values²¹. The answer to the constitutive question, in this case, involves the phenomenon of reason responsiveness: Nagel claims of evaluative facts that « it is through being recognized as reasons by a value-sensitive agent that they affect behavior²² ». This is an avowedly anti-psychologistic conception of explanation; again, a legacy of Nagel's much earlier work in *The Possibility of Altruism* where psychological explanation is constrained by some identifiable a priori principles of practical reason.²³ As in the case of

¹⁹ T. Nagel, *Mind and Cosmos*, p. 62.

²⁰ T. Nagel, *Mind and Cosmos*, p. 81.

²¹ T. Nagel, *Mind and Cosmos*, pp. 112–114.

²² T. Nagel, *Mind and Cosmos*, pp. 113.

²³ T. Nagel, *The Possibility of Altruism*, Oxford University Press, 1970. For an assessment of this radical anti-psychologism see A. Thomas, *Value and Context: the Nature of Moral and Political*

rationality, Nagel does not think that a reductive explanation will be plausible in this case.

When it comes to the historical question about value, Nagel argues that the answer is « much more obscure²⁴ ». Conscious, rational beings come to find value, not only in themselves but also in the world:

« According to the hypothesis of natural teleology, the natural world would have a propensity to give rise to beings of the kind that have a good – beings for which things can be good or bad²⁵ . »

This meets Nagel's criterion for an acceptable explanation as « value is not just an accidental side effect of life; rather, there is life because life is a necessary condition of value²⁶ . » This « predisposition » on the part of the cosmos is, Nagel admits, a speculation that is unlikely to find favor; but he endorses it only because he thinks no other explanation is plausible: it is an « admissible conjecture given the available evidence²⁷ . »

Before I turn to the alternative conception of the sciences of life that Nagel develops, and an associated critique of the current form of evolutionary theory, more needs to be said about his neutral monism. This is the crucial metaphysical breakthrough that has led Nagel to this large-scale critique of the sciences of life even though, as I have just noted, Nagel is worried about whether the view can be a comprehensive answer to *both* of the questions that he tries to answer, constitutive and historical, for each of the three domains of mentality, rationality and evaluation. Nagel believes that a relatively local philosophical problem – explaining the relation between the mental and the physical – has this dramatic consequence. That is because in understanding this relation between the mental and the physical we are given insight into the fundamental nature of the real, namely, that it is correctly described by neutral monism. I will now explain what that

Knowledge, Oxford, the Clarendon Press, 2006, chapter four; A. Thomas, *Thomas Nagel*, London, Routledge, 2008, chapter four.

²⁴ T. Nagel, *Mind and Cosmos*, pp. 117.

²⁵ T. Nagel, *Mind and Cosmos*, pp. 121.

²⁶ T. Nagel, *Mind and Cosmos*, pp. 123.

²⁷ T. Nagel, *Mind and Cosmos*, pp. 124.

view is supposed to be and how it relates to Nagel's independent commitment to panpsychism²⁸.

The Central Role of Neutral Monism

A version of neutral monism first emerged in Nagel's paper « The Psychophysical Nexus », where he first speculated that we are on the verge of discovering the nature of a substance whose nature necessitates that it manifests itself in both physical and mental properties²⁹. Nagel recapitulates some of the main claims of that paper in *Mind and Cosmos*:

« [T]he appearance of contingency in the relation between mind and brain is probably an illusion ... it is in fact a necessary but nonconceptual connection, concealed from us by the inadequacy of our present concepts ... we should expect theoretical progress in this area to require a major conceptual revolution ... We ourselves are large-scale, complex instances of something both objectively physical from outside and subjectively mental from inside. *Perhaps the basis for this identity pervades the world*³⁰. »

This « perhaps » forms the basis of the arguments of *Mind and Cosmos*: as « the Psychophysical Nexus » made clear, uncovering this substrate that upwardly necessitates both its mental and physical aspects would be an empirical discovery by the sciences of the mind; but there is philosophical insight in coming to understand the form that an intelligibility conferring explanation of the mental/physical relation has to take. So while there is one sense in which it is up to science to discover the substrate, there is another sense in which we have solved the philosophical problem of the mental/physical relation in that we have identified the form that any successful explanation would have to take.

This underlying substrate, then, is neither mental nor physical in its own right: hence the word « neutral ». There may well be a plurality of such substances, but each of them is of the same fundamental type, hence the monism. Yet, for reasons I will shortly explain, Nagel seems to have come to accept that this view is

²⁸ This commitment goes back to one of Nagel's earliest papers: T. Nagel « Panpsychism » in *Mortal Questions*, pp. 181–195.

²⁹ T. Nagel, « The Psychophysical Nexus » in *Concealment and Exposure*, Oxford, Oxford University Press, 2002, pp. 194–236.

³⁰ T. Nagel, *Mind and Cosmos*, pp. 41–2, emphasis added.

more accurately classified as a version of dual aspect theory and in *Mind and Cosmos* it is revised to make it a purer exemplar of neutral monism.

The key components of Nagel's version of neutral monism – a view with a long history in philosophy – is that it « accounts for the relation between mind and brain in terms of something more basic about the natural order »³¹. This « more basic » thing is unitary as « the constituents of the universe have properties that explain not only its physical but its mental character ». In *Mind and Cosmos* Nagel quotes Thomas Sorrell's view that these basic elements are « transphysical and transmental³². » This, then, captures both the neutrality of the elements – they are neither physical nor mental – and their unitary nature as they form one kind. Any basic constituent, even if is not part of a person, could be a part of something with mental features. Therefore, it must form part of an explanation of why a mental subject has an underlying nature that is, in itself, neither distinctively mental nor physical.

However, Leopold Stubenberg has noted an important shift between Nagel's position in « The Psychophysical Nexus » to the view later defended in *Mind and Cosmos*³³. The former explains the « neutrality » of mental and physical aspects via what Stubenberg calls the « neither » view: an aspect of a substrate is « neutral just in case it is intrinsically neither mental nor physical » He cites this passage as evidence of Nagel's earlier view of neutrality:

« [T]his view would imply that the fundamental constituents of the world, out of which everything is composed, are *neither physical nor mental but something more basic*. This position is not equivalent to panpsychism. Panpsychism is, in effect, dualism all the way down. This is monism all the way down³⁴ ».

Stubenberg contrasts this paragraph with the later position in *Mind and Cosmos*:

« Everything, living or not, is constituted from elements having a nature that is both physical and nonphysical—that is, capable of combining into mental wholes. So this reductive account can also be described as a form of panpsychism: *all the elements of the physical world are also mental*³⁵ ».

³¹ T. Nagel, *Mind and Cosmos*, p.56.

³² T. Sorrell, *Descartes Reinvented*, Cambridge, Cambridge University Press, 2005, p. 95. Quoted in T. Nagel, *Mind and Cosmos*, p. 57.

³³ L. Stubenberg, « Neutral Monism » in *The Stanford Encyclopedia of Philosophy* 2016.

³⁴ T. Nagel, *Mind and Cosmos*, p.231.

³⁵ T. Nagel, *Mind and Cosmos*, 2012, p.57.

Stubenberg's worry is that this is an equivocation – or shift – in what Nagel means by « neutral ».

In the earlier paper, Nagel holds what Stubenberg calls the « neither » view of the neutrality component of neutral monism: the aspects are neither intrinsically mental nor intrinsically physical. However, by the later book Nagel holds the « both » view of neutrality where aspects are both physical and mental. These are two different senses of « neutrality ». Seeking clarification, Stubenberg received the following explanation in personal correspondence from Nagel:

« [T]he fundamental elements would be neither merely physical nor merely mental, but something that was necessarily both physical and mental, (or protomental); but since this necessary connection can't hold directly between the physical and the mental as we conceive them, it would require that the real character of these fundamental constituents be something more basic that accounts for their being both physical and (proto)mental³⁶ ».

So Stubenberg is right: there is an important change here.

The view in « The Psychophysical Nexus » ought – in retrospect – to be interpreted as a form of dual aspect theory with a clear distinction between an underlying substance and the upwards entailment of two kinds of aspect – mental or physical. By *Mind and Cosmos* that view has been superseded by pansychism in a way driven by the commitment to monism. Nagel has always been a panpsychist, so in the period between the publication of these two works he seems to have revised his dual aspect theory to make it consistent with his panpsychism: on the « both » view of neutrality in the later work « the fundamental elements [are] necessarily both physical and mental ».

Yet, as we have seen, *Mind and Cosmos* combines a re-affirmation of Nagel's commitment to panpsychism with the frank expression of a problem for that view: Nagel is concerned that panpsychism may do better as an explanation of the constitutive nature of consciousness than as an account of its historical evolution. I would surmise that the postulation of teleological laws in *Mind and Cosmos* is developed precisely to address this subsidiary problem. Panpsychism remains as an answer to the constitutive question, but fundamental teleological laws are

³⁶ T. Nagel, T. personal correspondence, not dated, cited in L. Stubenberg, « Neutral Monism » in *The Stanford Encyclopedia of Philosophy* 2016.

necessary postulates if one wants to answer the historical question. They might also then play a role in any holistic account of the nature of rationality or in an explanatory account of the origin of value – Nagel is clear that his aim is nothing less than a « theory of everything ».

So what motivated Nagel's move from dual aspect theory to panpsychism as an answer to the constitutive question? I surmise that the crucial argument for the change is this: mentality does not manifest itself everywhere. Persons have mental attributes; pet rocks do not – not really. However, in any case where mentality does not manifest itself, the same underlying substrate must be involved (because of the commitment to monism). That substrate, then, either manifests physicality and mentality (where mentality is instantiated) or physicality and proto-mentality (where mentality is not instantiated). To preserve the unified nature of the underlying substance – this is, after all, a form of *monism* – it is always either one or the other: hence the panpsychism (in its « both » version where the fundamental elements are « transphysical and transmental »).

This is not, then, the claim that everything is mental, but that everything is either mental or « proto-mental ». This is the view, then, whose « appearance ... casts its shadow back over the entire process » – the process, that is, described by the sciences of life³⁷. Nagel presents his basic argument for monism as follows³⁸:

« [S]ince conscious organisms are not composed of a special kind of stuff, but can be constructed, apparently, from any of the matter of the universe suitably arranged it follows that this monism will be universal. Everything, living or not, is constituted from elements having a nature that is both physical and nonphysical – that is capable of being combined into mental wholes. So this reductive account can also be described as panpsychism; all the elements of the physical world are also mental³⁹ ».

Nagel frankly admits that his outline of how we might change our foundational assumptions in the life sciences is speculative, but it is reasoned speculation that appeals not to theism, but to « complications to the immanent character of the natural order⁴⁰ ». It would not only be a unifying explanation, but a *more* unifying

³⁷ T. Nagel, *Mind and Cosmos*, p. 8.

³⁸ Nagel explains his distinction between “reductive” and “reductionist”: T. Nagel, *Mind and Cosmos*, p. 44, fn. 14.

³⁹ T. Nagel, *Mind and Cosmos*, p. 57.

⁴⁰ T. Nagel, *Mind and Cosmos*, p. 12.

explanation that its theistic rivals given that those views, too, assume that the only naturalistic option is a reductive naturalism. Reductive naturalism shapes the form taken by the theistic « intelligent design » alternative; absent the presumed sexism, we can use J. L. Austin's phrase that these two positions "take in each other's washing"⁴¹. Nagel's position is, in that sense, even more radical than that envisaged by proponents of intelligent design: his view is that « materialist naturalism, is false, and not just around the edges »⁴². One immediate payoff, as the book makes clear, is that we need to take another look – a more sceptical and challenging look – at the reductionist, materialist, understanding of the theory of evolution.

Nagel's Critique of Evolutionary Theory

Nagel's critique of the theory of evolution is at the heart of his book and explains a great deal of the controversy that it has generated. This is not least because in developing this critique Nagel is happy, in developing a sceptical account of the theory of evolution in its current guise, to borrow arguments from religiously motivated proponents of intelligent design – even while he rejects their alternative theistic explanation for the appearance of design. (In their case, that the appearance ought to be accepted at face value.) We need to explain how mentality could have evolved, given the truth of Nagel's neutral monism, as opposed to simply accepting existing conceptions of evolution too closely tied, he implies, to psychophysical reductionism.

As Nagel notes – anticipating the controversy his book would cause – criticizing the theory of evolution is viewed as both « politically incorrect » as well as scientifically incorrect. But Nagel believes that standard conceptions of evolutionary theory – he calls them variously « materialist » or « neo-Darwinian » – fall with the psycho-physical reductionism they seek to vindicate. He argues that, to this point, we have understood the « Book of Nature » in physico-mathematical terms that have omitted the mind's place in nature. Concomitantly, biological

⁴¹ « [T]hese two terms, 'sense data' and 'material things', live by taking in each other's washing – what is spurious is not one term of the pair, but the antithesis itself. » J. L. Austin, *Sense and Sensibilia*, Oxford University Press, p. 4. (I think we may safely presume that Austin did not take in his own washing.)

⁴² T. Nagel, *Mind and Cosmos*, p. 15.

theory has restricted itself to mechanistic explanations as part of this unhappy alliance with psycho-physical reductionism. Neutral monism opens up the prospect of a reorientation of the sciences of life around principles that « are in their logical form teleological and not mechanistic⁴³ ».

« Mind, as a development of life, must be included as the most recent stage of this long cosmological history, and its appearance ... casts its shadow back over the entire process and the constituents and principles on which the process depends⁴⁴. »

Can we infer, then, from this foundational error in the assumptions of evolutionary theory, that it is intellectually unsatisfactory in its current form?

Nagel thinks that we are entitled to draw this conclusion. In particular, he claims that evolutionary theory, understood in a reductive and mechanistic way, cannot answer two questions:

« [W]hat is the likelihood that self-reproducing life forms should have come into existence spontaneously on the early earth, solely through the operation of the laws of physics and chemistry?

In the available geological time since the first life forms appeared on earth, what is the likelihood that, as a result of physical accident, a sequence of viable genetic mutations should have occurred that was sufficient to permit natural selection to produce the organisms that actually exist?⁴⁵ »

Nagel adds further claims to his critique: that evolutionary theory is incomplete (merely an explanation sketch or « schema »); it lacks sufficient evidential support and must rest on « general assumptions »; that it runs contrary to common sense⁴⁶.

Critics are surely right to find this conjunction of claims about the current understanding of evolutionary theory unconvincing. To take them in reverse order: being « contrary to common sense » is a weak argument given that many well-established scientific claims seem contrary to common sense. An historical perspective on how scientific theories of the past were received by the audiences

⁴³ T. Nagel, *Mind and Cosmos*, p. 7.

⁴⁴ T. Nagel, *Mind and Cosmos*, p. 8.

⁴⁵ T. Nagel, *Mind and Cosmos*, p. 6.

⁴⁶ T. Nagel, *Mind and Cosmos*, pp. 6–7.

contemporaneous to them would seem to strengthen this point – particularly so in the case of the theory of evolution when first put forward by Darwin.

On Nagel's second objection: whole books are written on why superstring theory is a sociologically well-entrenched position in physics poorly supported by evidence. On any realistic conception of how science actually operates sometimes « general assumptions » do play an important role in the acceptance of scientific theories. Clearly, there may be something intellectually unsatisfactory about this state of affairs if it persists – or the critiques of superstring theory would not be written – but my point is that it is not unusual for « general assumptions » to carry a burden of proof, at least provisionally. The answer to Nagel's concern would seem to be: more and better science (of the same general type) in the field concerned that will see us do better « over the long run ».

Finally, on the third point, if we have only explanation sketches in these cases, then the answer, once again, is that scientists working in the field face the task of coming up with better, more detailed, more convincing explanations – a task that does not require comment from the sidelines from those not expert in the field.

If Nagel's challenge to the current understanding of evolutionary theory is to be stronger than this, then, he needs to do more than raise sceptical questions about it; these are what Peirce called « paper doubts ». He needs to substantiate the claim that the transition from psycho-physical reductionism in the philosophy of mind to neutral monism pays substantial philosophical dividends. It is *because* we have been successfully convinced that we need a new paradigm for the explanation of mind and value that we are forced to revise our assumptions about evolutionary theory and to look at its foundational commitments in a new light.

Nagel may reasonably respond that it is not his job to re-write the life sciences; it is simply to draw attention to some of their deepest foundational commitments in order to hold open intellectual possibilities that seem definitively closed for mistaken reasons. But if we seek more than that, there must at least be an outline of an argument that takes us from Nagel's foundational re-orientation to better answers to the two, fundamental, probabilistic questions with which he begins: first, how does the recovery of natural teleology allow us to give better

answers to the questions of the origin of life? Second, is a single mechanism adequate to explain all the current forms that life takes?

Nagel believes that we are justified in beginning from our well-grounded experiences that we use our ordinary capacities for knowledge – perception, reason and conscious awareness – and to conclude on that basis that this is data that no intellectually satisfying explanation can overturn. Re-capitaluating some of the central claims of his book *The Last Word*, the exercise of our basic capacities for knowledge gives us reasons with greater intellectual authority than that of any sceptical challenge to those capacities and reasons.⁴⁷ On the contrary, this basic point guides us towards a constraint on a solution to the problem to hand:

« [T]he appearance of living organisms has eventually given rise to consciousness, perception, desire, action and the formation of both beliefs and intentions on the basis of reasons. If all this has a natural explanation, the possibilities were inherent in the universe long before there was life, and inherent in early life long before the appearance of animals. A satisfying explanation would show that the realization of these possibilities was not vanishingly improbable but a significant likelihood given the laws of nature and the composition of the universe. It would reveal mind and reason as basic aspects of a nonmaterialistic natural order⁴⁸ .»

It is worth recalling that by « nomaterialistic » Nagel is here referring back to his neutral monism in which the basic elements of reality are trans-mental and trans-physical alike. What conception of law would make it intelligible how elements like these developed over time to compose conscious, rational, valuing creatures like us?

Nagel is transferring the burden of proof: given other things we know, of at least *as much* certainty as the theory of evolution, then that theory must meet the standard of rationalist intelligibility in explaining how creatures with our capacities came into existence – or we must reject that standard. Several of Nagel's critics have willingly embraced the latter option; now the burden of proof is on *them* to offer individual explanations of how we do not seem to know what Nagel thinks we can demonstrate that we do know. We know, in a way immune to sceptical challenge to our basic capacities for knowledge, that we

⁴⁷ T. Nagel, *The Last Word*, Oxford, Oxford University Press, 1997.

⁴⁸ T. Nagel, *Mind and Cosmos*, p. 32.

are conscious beings with direct knowledge of the truths of reason. Given his wider philosophical rationalism, Nagel extends this defense to the truths of mathematics and ethics, too. If, however, we accept the standard, and accept the validity of the knowledge claims, then we need to look again at the foundational assumptions of the sciences of life as Nagel recommends and as I shall now exposit.

Nagel's Renovated Conception of the Sciences of Life

Given the boldness of Nagel's claims, one might have expected in *Mind and Cosmos* a detailed working out of the new form that the sciences of life must take. However, Nagel believes – correctly in my view – that this is not the role of the philosopher. The task she faces is to articulate the relation between high level and abstract conceptions of how the world works to the more detailed specification of those conceptions exemplified by the sciences themselves. Philosophy and the sciences may well have parted company for good in the seventeenth century – those who complain that philosophy makes no intellectual progress forget that it spins off successful sciences that become autonomous from it – but philosophical presuppositions may continue to place empirical enquiry on the wrong path by falsely constraining the available options. That seems to be Nagel's view: empirical scientists go about their business with no regard for philosophy, but he implies that high level philosophical misconceptions may play a role in prematurely shutting down paths of enquiry that should have remained open. The mechanisation of the world-picture was undoubtedly a significant intellectual achievement, but if philosophers are guilty of over-generalising its success, then they are prematurely foreclosing on explanatory options in the sciences of life without sufficient grounds for doing so.

The basic idea, then, is that we need a general conception of the sciences of life that does not reflect the false philosophical outlook of the reductionist materialist. Nagel's specific proposal, as I have noted, depends on the constraints placed on these sciences by his panpsychism.

The panpsychist has to deny that the mental emerges from the fundamentally non-mental, whether in the development of each individual or at the level of the whole species. The obvious opponent here is the emergentist, who

argues that the fundamentally non-mental can develop in its complexity until we reach the point at which sophisticated biological organisms start to exhibit cognitive states – at some particular time in their evolutionary history. As a further, complex development within cognition – and different accounts explain this complexity in different ways – cognition develops into consciousness⁴⁹. So conscious mentality is an emergent feature of sophisticated organisms that also have a « base level » description that is wholly physical. This is the emergentist explanation of mentality that is a rival to Nagel’s panpsychism.

Nagel recapitulates, and endorses, his earlier critiques of emergentism interpreted as a constitutive account of what makes a given organism conscious; « it still seems like magic »⁵⁰. Emergence, for Nagel, can play a limited part in derivative explanations; his critique applies only its deployment in basic explanations. However, he thinks that even in derivative explanations the idea of emergence must always be « cashed out ». However, when we do cash it out we see that it is « analysed through the character and interactions of ... more elementary components⁵¹ » and can see its inadequacy. Any such explanation rules out the « completely new »; but this is why the emergentist cannot explain consciousness⁵². Nagel can accept the uncontroversial claim of epistemic emergence where we can be surprised by a discovery of a consequence of what we know. Metaphysical emergence is categorical different. The panpsychist denies that the mental could ever emerge from the non-mental even if we add in complexity. If you make a complex physical system even more complex, well, that is what you end up with – a difference of degree, not one of kind. For Nagel, even the most complex physical systems still fall the wrong side of the mental/physical divide:

⁴⁹ J. Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*, Houghton Mifflin, 1990. D. Dennett « Julian Jaynes’ s Software Archaeology » in *Canadian Psychology*, vol. 27, no. 2, pp. 149–54, 1986.

⁵⁰ T. Nagel, *Mind and Cosmos*, pp. 55–6.

⁵¹ T. Nagel, *Mind and Cosmos*, p. 56.

⁵² This objection is repeated in connection with a suggestion of Sharon Street’s proposal of a psychophysical, historical, theory of the emergence of conscious organisms: a “brute fact of emergence ... therefore essentially mysterious”. Yet Nagel concedes that this view “[requires] the smallest alteration to the prevailing physical form of naturalism”. T. Nagel, *Mind and Cosmos*, p. 61.
[huh? This is obscure.]

« If evolutionary theory is a purely physical theory, then it might in principle provide the framework for a physical explanation of the appearance of behaviorally complex animal organisms with central nervous systems. But subjective consciousness, if it is not reducible to something physical, would not be part of this story; it would be left completely unexplained by physical evolution – even if the physical evolution of such organisms is in fact a causally necessary and sufficient condition for consciousness⁵³ .»

For the rationalist such as Nagel, it is not sufficient to assert a brute correlation between sophisticated physical things and mental features: their co-occurrence must be intelligible, hence necessitated. (Needless to say, those not equally committed to philosophical rationalism deny this connection: for them, perhaps necessities are intelligible, but the converse does not hold.⁵⁴)

From Nagel's perspective it is non-accidental that some physical things are conscious, so a reductionist naturalism that sees a world wholly describable in terms of basic physical causal laws is failing even to explain the actual world. That is because it is failing to explain part of it – its conscious, mental, part. If the implication of reductionist naturalism is that the fundamental workings of the world can stay the same whether parts of it are conscious or not – modulo some magical mind stuff added to it to explain why parts of it are conscious when they are – then this is a flawed basic conception⁵⁵. This is the fundamental thought that motivates Nagel's panpsychism: we have to build in to our basic conception of the world that part of the world manifests mental properties. This potentiality, then, must be an aspect of even the most fundamental properties: hence the conception of them as trans-physical and trans-mental⁵⁶.

An important intermediate assumption in Nagel's argument is that what he calls a « nonhistorical » theory of consciousness, which explained of any particular organism why it was or was not conscious, cannot be independent of a theory of how conscious organisms arose in the first place. A single process would have to explain both the evolution of conscious mentality and supply the basis for the

⁵³ T. Nagel, *Mind and Cosmos*, p. 44.

⁵⁴ I am grateful to an anonymous referee for this journal for reminding me of this anti-rationalist position by, as it were, holding it.

⁵⁵ "On a purely materialist understanding of biology, consciousness would have to be regarded as a tremendous and inexplicable extra brute fact about the world". T. Nagel, *Mind and Cosmos*, p. 45.

⁵⁶ T. Nagel, *Mind and Cosmos*, p. 45.

« nonhistorical » product of that process. That is why his panspsychism evolves in *Mind and Cosmos* to include a novel conception of scientific law that could accommodate that explanatory demand.

Nagel thinks that a reconsideration of the sciences of life would have to include « a teleological account » that postulates the existence of « principles of self-organisation or of the development of complexity over time »⁵⁷ that are not solely grounded on casual law as conceived of in an orthodox way:

« Natural teleology would mean that the universe is governed rationally in more than one way – not only through the quantitative laws of physics that underlie efficient causation, but also through principles which imply that things happen because they are on a path that lead toward certain outcomes – notably, the existence of living, and ultimately of conscious organisms⁵⁸ .» [Nagel, 2012, p. 67]

To this point panspsychism has not taken this extra step; from Nagel's perspective, the panspsychist is being unduly conservative about the kinds of laws that there are. If they can appeal only in their reductive, historicist, explanation of the emergence of conscious life to orthodox causal law their account will be unconvincing. It is forced to take the form of a “mentalist reductionism” that sees mentality as a propensity built into the nature of matter. Nagel is sceptical that this general form an explanation does confer any intelligibility:

« The protopsychic properties of all matter ... are postulated solely because they are needed to explain the appearance of consciousness at high levels of organic complexity. Apart from that nothing is known about them: they are completely indescribable and have no predictable local effects⁵⁹ .» [Nagel, 2012, pp. 61-62]

So as an answer to Nagel's two questions, then, he seems to have come to believe that panspsychism can really only answer his constitutive question about conscious mentality. Explanations of its historical emergence or parallel explanations of cognition or value are going to need to appeal to his novel postulation of basic, teleological laws in the life sciences. As always, this need arises because Nagel can see no other way of doing justice to that which needs to be explained.

⁵⁷ T. Nagel, *Mind and Cosmos*, p. 459.

⁵⁸ T. Nagel, *Mind and Cosmos*, p. 67.

⁵⁹ T. Nagel, *Mind and Cosmos*, pp. 61–2.

Is this a Vindication of Theism?

In the development of his project, Nagel unfolds a dialectical contrast between theism and materialism; predictably enough, both postulate « explanation stoppers » that fail to meet the requirement posed by Nagel's « form of the principle of sufficient reason⁶⁰ ». Theism ends the regress of justification in mentality, admittedly the mentality of an agent of an unusual kind (as it also has the feature of existing necessarily):

« Theism offers a vicarious understanding, by assigning it to a transcendent mind whose purposes and understanding of the world we cannot ourselves fully share, but which makes it possible to believe that the world is intelligible, even if not to us⁶¹ .»

As a counter-reaction to reductionist naturalism, the view is well-motivated. But, for Nagel, theism is finally unacceptable because it « pushes the quest for intelligibility outside the world⁶² ».

Materialism is fundamentally grounded on a compact set of physical laws that are, conceivably, a selection from alternative possible sets. The explanations it offers of our human capacities is insufficiently reassuring: « evolutionary naturalism provides an account of our capacities that undermines their reliability, and in doing so undermines itself⁶³ . »

Neither theism nor reductive naturalism (materialism) can, then, be anything other than a temporary stopping point for Nagel's kind of objective idealist. The key elements Nagel isolates in both views is that they seek comprehensiveness, and must therefore include their own generation and acceptance. They must be « reflexive » by which I mean that both views have to give an account of the social practices, norms and values in which the very enterprise of finding out the fundamental truth about reality that each project is embedded. Each places a constraint on the vocabulary we can use to give this

⁶⁰ T. Nagel, *Mind and Cosmos*, p. 17.

⁶¹ T. Nagel, *Mind and Cosmos*, p. 23.

⁶² T. Nagel, *Mind and Cosmos*, p. 26.

⁶³ T. Nagel, *Mind and Cosmos*, p. 27.

account: the austere resources of reductionist naturalism seems unable to explain the very idea of a reason for belief. The limited resources of theism postulate an agent in some ways like us, but in a fundamental way not – an agent whose motivations must be opaque to us. Nagel's aspiration is for something less ambitious: a reflective « placing » of our human point of view that is a « plausible picture of how we fit into the world⁶⁴. »

Rather than allowing evolutionary naturalism to undermine our most basic capacities of knowledge – given that such an ambitious would be internally self-undermining – Nagel claims that the argument ought to be reversed: our most « basic forms of thought » are not candidates for being undermined by evolutionary understanding:

« [I]t seems reasonable to run the test equally in the opposite direction: namely, to evaluate hypotheses about the universe and how we have come into existence by reference to ordinary judgements in which we have very high confidence⁶⁵. »

Again, consistently with Nagel's previous expressions of his philosophical outlook, we should not resile to quietism where that would mean delineating our conceptual scheme « from within » and noting differences between different forms of representation without investigating issues of explanatory priority⁶⁶. Because reality is unitary, all our representations – of different degrees of « perspectivalness » – have to be mutually adjusted and reconciled to be placed in some intelligible relation to it: quietism does not face up to the fact that « the question is there, whether we answer it or not⁶⁷. »

The failure of theism and reductive naturalism, then, leaves that which is to be explained intact: the exercise of basic capacities of knowledge.

« The existence of conscious minds and their access to the evident truths of ethics and mathematics are among the data that a theory of the world and our place in it has yet to explain. They are clearly part of what is the case, just as much as the data about the physical world provided by perception and the

⁶⁴ T. Nagel, *Mind and Cosmos*, p. 25.

⁶⁵ T. Nagel, *Mind and Cosmos*, p. 29.

⁶⁶ T. Nagel, *Mind and Cosmos*, p.31.

⁶⁷ T. Nagel, *Mind and Cosmos*, p. 30.

conclusions of scientific reasoning about what would best explain that data. We cannot just assume that the latter category of thought has priority over the others, so that what it cannot explain is not real⁶⁸ .»

These facts are as they are; Nagel is convinced that neither reductionist materialism, nor theism, offer any credible explanation for them. Like Ryle, in his rejection of the ghost in the machine, Nagel is aware of how these two flawed conceptions – one of mentality and the other of matter – work in tandem to make both equally unacceptable.⁶⁹ The picture of a mechanised nature into which a divine agent intrudes is a macro-level equivalent of the micro-level account of the mental-physical relation to which Ryle and Nagel are equally opposed.

How Plausible are these Arguments?

I turn now from exposition to criticism. Nagel's book has met with a great deal of criticism, much of it severe, but not always charitable. I will begin with the simpler cases where exegetical charity might have led to a more reasonable understanding of Nagel's position that might have forestalled some of this criticism (or at least muted its tone).

First, Nagel's defense of « common sense ». Peter Godfrey-Smith's response, in a fair-minded review, is the most forthright: « this is one area in which intuitions are worth nothing⁷⁰ ». I think that is correct: it would be unfortunate indeed if a developed scientific theory were being rejected on the basis of common sense. However, that would be a very uncharitable reading of Nagel's argument. By vindicating « common sense » Nagel is not setting the truth of any specific claim of common sense against the truth of a theory; he is, rather, vindicating the underlying capacities for knowledge manifested in such claims. The only exception to this claim are the truths of reason that Nagel claims are self-evident, but if he is right, then the interest here is in the claim of self-evidence and not in the observation that such truths form part of common sense (if they do). If there are a priori truths – and plausibly there are – every view needs an explanation of their special epistemic status.

⁶⁸ T. Nagel, *Mind and Cosmos*, p. 31.

⁶⁹ G. Ryle, *The Concept of Mind*, Chicago, University of Chicago Press, 2000.

⁷⁰ P. Godfrey-Smith, « Not Sufficiently Reassuring: review of Nagel's *Mind and Cosmos* » *London Review of Books*, vol. 35, no. 2, pp. 20–21.

Nagel is avowedly a rationalist and has been since *The Possibility of Altruism*: we have a capacity for reason that is expressed by our capacities for knowing specific truths of mathematics and ethics (to take two of Nagel's favourite examples)⁷¹. When that capacity seeks to find a home for itself in the world, and does not find a convincing explanation of this in the world-view of the reductionist naturalist, Nagel asks whether another view is possible.

A second objection runs as follows: ought the philosopher be lecturing to the scientist? Again, that is not Nagel's view: reductionist naturalism is extrapolated from the actual results of the sciences and is not itself a scientific view. Conversely, the philosophical question of whether there are irreducibly teleological forms of causation has not been answered solely by the rise of a mechanistic world-picture in the seventeenth century as John Hawthorne and Daniel Nolan point out in a paper to which Nagel refers approvingly⁷².

If the question had been settled in this way, then at least we are owed an account of the empirical content of the theory and the process by which it was refuted. Yet, Hawthorne and Nolan note that « the relation of the hypothesis of final causation to evidence is much more of a philosophical puzzle » than workaday cases of explaining, say, how phlogiston theory was overturned by the evidence. In their paper, Hawthorne and Nolan construct a model teleological law, where law-likeness is explained in David Lewis's way as combining simplicity and informativeness. They then ask, rhetorically, why there could not be laws of this kind? (They strengthen their argument by noting that teleological laws might be found in the special sciences and thereby restricted to particular domains.) If Hawthorne and Nolan have presented, as it were, a « proof of concept » then we can conclude, at least, that Nagel's proposed natural teleology is not a priori false nor internally inconsistent. If he can make a prima facie case that teleology of this kind is necessary to explain the sciences of life, then there is, as it were, a case to answer – even if the final determination is handed over to the empirical sciences and not left to philosophers.

⁷¹ T. Nagel, *The Possibility of Altruism*, Oxford, Oxford University Press, 1970.

⁷² J Hawthorne & D. Nolan, Daniel « What Would Teleological Causation Be? » reprinted in J. Hawthorne, *Metaphysical Essays*, Oxford, Oxford University Press, 2009, pp. 265–284.

A third objection could be viewed as meta-philosophical: Nagel is bundling together non-reductionist solutions to the explanation of how we have knowledge across several domains such as the moral, the mathematical, and a priori truths about the structure of reason itself. Neutral monism is an overarching metaphysical theory that explains the fundamental nature of the reality that can accommodate such truths and the capacities of reason that underlie them: so we need an account of the sciences of life consistent – strictly, *more* consistent – with the truth of neutral monism or panpsychism. (We have seen Nagel canvas the advantages or disadvantages of both views.)

If this his how we are best to understand Nagel's project, then it looks like a particular ambitious version of an inference to the best explanation. *Mind and Cosmos* is the search for an overall package of commitments that is strengthened by its comprehensiveness. The critic may urge that we ought, case by case, to explain specific problems in specific ways and that inferences to the best explanation are not meta-philosophically defensible. But if he is mistaken on this point, then Nagel is at least in good company: for example, David Lewis's *On the Plurality of Worlds* defends modal realism precisely by such an inference to the best explanation that spans solutions to several distinct philosophical problems⁷³. Lewis seems also to believe that his overall view – whatever its intrinsic plausibility – gains credibility from its comprehensive coverage of disparate problems.

Most charitably, Nagel is not telling the scientist in the life sciences what to do in the practice of her discipline, simply freeing up that practice from false assumptions imposed by other philosophers – not scientists:

« Philosophy cannot generate such explanations; it can only point out the gaping lack of them, and the obstacles to constructing them out of presently available materials⁷⁴. »

Reductionist materialism is the premature closing down of options that need to be kept open. This is a claim at a high level of generality; I have heard the distinguished philosopher of science Hilary Putnam remark that Karl Popper's

⁷³ D. Lewis, *On the Plurality of Worlds*, Oxford, Wiley-Blackwell, 2001.

⁷⁴ T. Nagel, *Mind and Cosmos*, p. 68.

criterion of falsifiability could not be a mark of a genuine theory because many theories are so crazy that there is no point testing them in the first place. But Nagel is not adding another crazy theory to this list; simply issuing a reminder that the case against basic teleological laws in the life sciences has not conclusively been made – a claim at a high level of generality. So there is at least a *prima facie* case for considering whether teleological laws are admissible candidates for a renovation of the life sciences. The task of producing such theories is not Nagel's; but that task can be pursued freed from a false philosophical preconception that laws of a certain character are not even candidates for reasonable consideration.

A fifth objection seem to me to carry more weight: it is raised by John Dupré in his insightful review of the book. Nagel postulates irreducibly teleological developmental laws to explain why conscious mentality (and rationality, and an inner nisus towards value) historically developed in a way that makes them *more* probable than they would be on a purely mechanistic understanding of their development. As Dupré notes, it may certainly be desirable that an explanation make an event very probable relative to the set up in which it develops. However, he also notes not all explanations work like this:

« Nagel constantly asserts that to explain the existence of consciousness, etc., evolution must not just show that they are possible, but also that they are likely, or to be expected ... [this] seems to me poorly motivated. At the time of my birth it was very unlikely that I would several decades later be reviewing a book by a famous philosopher; but it is not mysterious that this eventually came about. The improbability has been declining rapidly for the last few decades. Just so with evolution. The evolution of reason may well be very unlikely indeed on a young, hot planet. It's a great deal more likely by the time there are highly social, if not yet rational, multicellular organisms with very complex nervous systems⁷⁵. »

Perhaps we should view the developmental process as involving a series of discontinuous breaks that, in each case, fundamentally re-set the baseline probabilities *relative to each new set up*.

That may invite a response from Nagel that we would like to do better: his rationalist, teleologically grounded explanation of the emergence of conscious and rational subjects is more intellectually satisfying than its materialist rival. (We

⁷⁵ J. Dupré, « Review of Nagel's *Mind and Cosmos* » *Notre Dame Philosophical Reviews*, 29th October 2012.

have seen that his critique of emergentism involves denying Dupré's last quoted point: for Nagel, no amount of biological complexity can explain the emergence of conscious mentality.) But the point is that there is a gap between the claim that one style of explanation can do better than another when it comes to making the development of an event more probable, and the claim that does better in making the occurrence of the event more « intelligible ».

I take Dupré's deeper point to be that intelligibility is, in that sense, quite a weak constraint and both kinds of laws – causal–mechanical and teleological – can meet it. It may be *less* intellectually satisfying to postulate a low-probability event that then makes subsequent events more probable relative to the new set up that it establishes; but it meets Nagel's constraint of being intelligible. Perhaps we simply cannot do any better in this case.

The sixth, and final, objection is that Nagel is too loose in his definitions and attacks a straw man – or a succession of them. An example that a critic might cite is Daniel Stoljar's paper in which he argues that neutral monism is actually a form of physicalism and not an alternative to it.⁷⁶ I think the best response here is to say that of course a book like *Mind and Cosmos* is an invitation to further work and to further arguments – such as formulations of non-standard versions of physicalism of the kind Stoljar develops. If no one remains committed to the epistemological project of unity represented by *the Encyclopedia of Unified Science*, or to psycho-physical reductionism, then from Nagel's perspective that can only be good news. In fact, it seems to me that he is right to identify « bald naturalism » as a strong undercurrent in recent philosophy in the analytic tradition.

Conclusion

I think it is reasonable to describe the critical reception of Nagel's book as unfortunate. It should be clear from all of the foregoing that Nagel is simply working through the implications of philosophical commitments that he has held for decades. « The Psychophysical Nexus » is only a comparatively recent paper;

⁷⁶D. Stoljar « Two Conceptions of the Physical », *Philosophy and Phenomenological Research* vol. 62, no. 2, pp. 253–281.

his commitment to panpsychism pre-dates it by decades. The central part of the argument of *Mind and Cosmos* is driven by Nagel's attempt to specify the impact of absorbing the claims of the later paper into the framework of the earlier and envisioning the consequences for the sciences of life⁷⁷. That we ought not simply to assume that the idea of a teleological law is an obsolete relic is an option worth pursuing, particularly given Hawthorne and Nolan's clear explanation of how a law could take this form. They explain how such laws are possible; Nagel gives grounds for taking some of these laws to be actual. It is not his job to discover them, but to enrich the intellectual possibilities of those working in the sciences of life given that we can all agree that the problem of explaining mentality, rationality and value are hard problems.

On specific issues, Nagel is not alone in holding the views he does: he shares his conception of the problem of consciousness with David Chalmers; he shares his « reasons realism » with Charles Larmore and Thomas Scanlon; he shares his panpsychism with Galen Strawson⁷⁸. Neutral monism, in its Russellian guise, is currently undergoing a resurgence⁷⁹. Nagel's sin, it seems, was to attempt to weave these views together in a single synthesis and then derive implications from them for the life sciences that led to his critique of the theory of evolution. It is the latter that has earned him the hostility of several of his reviewers.

Nagel explicitly states that he has been influenced by the critique of evolutionary theory developed by proponents of the intelligent design hypothesis, but he is equally explicit that he rejects both that hypothesis of intelligent design and the theism that grounds it. It seems odd, then, for his critics to accuse him of supernaturalism when Nagel explicitly states that specific explanations in the natural sciences cannot be grounded on facts about divine agency – the conception

⁷⁷ As he remarks, those who remain committed to psycho-physical reductionism “can regard the argument that follows as a hypothetical one”. He adds “I assume this hypothetical position will be welcome to reductionists, since it shows just how extravagant and costly a position antireductionism in the philosophy of mind is”. T. Nagel, *Mind and Cosmos*, p. 43.

⁷⁸ D. Chalmers, *The Conscious Mind*; C. Larmore, *The Autonomy of Morality*, Cambridge, Cambridge University Press, 2008; T. Scanlon, *Being Realistic About Reasons*, Oxford, Oxford University Press, 2014; G. Strawson, et al *Consciousness and Its Place in Nature: Does Physicalism Entail Panpsychism?* Exeter, Exeter Academic, 2013.

⁷⁹ B. Russell, *The Analysis of Matter*, London, Kegan Paul, 1927; G. Rosenberg, *A Place for Consciousness: Probing the Deep Structure of the Physical World*, Oxford, Oxford University Press, 2005; P. Goff *Consciousness and Fundamental Reality*, Oxford, Oxford University Press, 2017.

of God as some kind of party magician.⁸⁰ The general charge seems to be that Nagel is keeping bad company.⁸¹ But it can hardly be a constraint on a work of speculative metaphysics that it ought not to be published because some things ought not to be said, as it were, « in front of the children ». Nagel's sympathies are with intelligent design's critique of reductionist naturalism – not with intelligent design itself, that he makes clear is an explanatory non-starter.

More generally, there are complaints that Nagel begs the question when it comes to assuming the truth of moral or mathematical realism, or to there being truths of reason, or to there being a hard problem of consciousness.⁸² These really are instances where one philosopher announces assumptions and draws a certain conclusion only for critics to respond that, given the conclusion, the assumptions are unacceptable – it is not as if Nagel has not already discharged his intellectual responsibilities in making arguments for each of these claims in what is now an extensive body of work. Each is, undoubtedly, a disputable claim; but there are not many indisputable claims in philosophy. If Nagel's inventory of his own candidates for indisputable truths is faring as poorly as everyone else's similar list then so be it. However, given that Nagel has made the case for these theses elsewhere is he not entitled to draw out what would be, for him, the inference to the best explanation that makes them both probable and credible?

Perhaps we should conclude that philosophers do stand to learn at least this much from the sciences: Helen Longino has convincingly made the case for what she calls theoretical or explanatory pluralism.⁸³ We need to keep as many theoretical options open in the sciences as possible, because that which we seek to explain is very complex. She concludes that we *may* need many intellectual tools in our toolkit. Hasok Chang has added the claim that we need a lot of theoretical options in the sciences even to explain very simple things, for which we *do* know

⁸⁰ Leiter, B., & Weisberg, M., « Do You Only Have a Brain?: On Thomas Nagel » *The Nation*, October 12, 2012.

⁸¹ Leiter, B., & Weisberg, M., « Do You Only Have a Brain?: On Thomas Nagel » *The Nation*, October 12, 2012; J. Dupré, « Review of Nagel's *Mind and Cosmos* » *Notre Dame Philosophical Reviews*, 29th October 2012.

⁸² S. Blackburn, « Thomas Nagel: A Philosopher who confesses to finding things bewildering » *The New Statesman*, 8th November, 2012; J. Dupré, « Review of Nagel's *Mind and Cosmos* » *Notre Dame Philosophical Reviews*, 29th October 2012.

⁸³ H. Longino, *The Fate of Knowledge*, Princeton, NJ, Princeton University Press, 2001.

that we need a lot of intellectual tools in our toolkit.⁸⁴ For a subject on a less secure epistemic basis than the sciences, namely philosophy, this would seem to be methodologically sound advice pertinent to the present case. Speculative rationalism is not well represented in the toolkit of recent philosophers, but it would be unfortunate if philosophy decided it could dispense with it altogether.

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⁸⁴ H. Chang, *Is Water H²O?*, Berlin, Springer, 2012.

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