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14 Natural Sciences as Constraints on Ideas about the Divine

Abstract: The sciences are very successful. The Periodic Table of Elements covers all of material existence. There is coherence across levels of reality. However, there are limit questions that cannot be answered by science, and worldviews are underdetermined by theories and data. Furthermore, our human practices and judgments are categorically different in kind. What are the implications of the natural sciences for views of reality and of the divine? It is argued that the sciences provide constraints on philosophical theology; much is excluded. But the sciences do not imply a single worldview or theology. A theist can emphasize divine transcendence, envisaging God as the creator of all of natural reality. A religious naturalist may appreciate natural reality as a reality with sacred depth. Different 'ontologies of the divine' may be consistent with the sciences.

14.1 Introduction

Though this volume is about the divine, this contribution focuses on our knowledge of 'all else,' of the universe and our own bodily existence. What does it imply for possible views of reality and of the divine if we depart from the natural sciences as our prime source of knowledge?

We will begin with a characteristic example of successful science: the Periodic Table of Elements. The insights it represents cover all of material existence. Chemistry is relevant to biology and other 'higher' disciplines, while chemical properties can be explained by physics. There is coherence across levels of reality.

The sciences provide answers to some questions, by collecting data, making models, and formulating theories. Answers may give rise to further questions. Some of those are passed on to other disciplines, e.g. from chemistry to physics, from geology to cosmology. At the outer limits of science, we encounter philosophical questions that may be raised in the context of science but cannot be answered by science. Furthermore, scientific theories are underdetermined by data, and worldviews are underdetermined by theories, leaving room for multiple metaphysical and epistemological interpretations. And though we, humans, as natural beings can be understood by the sciences, in our scientific knowledge we assume that we can step outside the limitations of our natural existence. And as agents we bring to our deliberations considerations that need a richer vocabulary. Moral

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judgments cannot be justified by reference to the natural sciences alone; values are categorically different from the descriptive and explanatory insights provided by the sciences.

What might be consequences of the success of science, but also of the unavoidability of limit questions, of underdetermination and of categorical distinctions for our thinking about God and the world? If one accepts scientific knowledge in this space age, we cannot envisage God as a being sitting on the clouds. It is also problematical to claim a role for God by arguing for the incompleteness of scientific explanations, a 'God of the gaps.' The sciences function as a constraint on philosophical theology. They do not imply a single worldview or theology. A theist could emphasize divine transcendence, envisaging God as the creator of all of natural reality—a reality with an internal coherence as uncovered by the sciences. A religious naturalist might appreciate natural reality as a reality with sacred depth. Different 'ontologies of the divine' can be consistent with the sciences.[1]

14.2 Strengths of the Sciences

In school classes where chemistry and physics are taught, we find depictions of the Periodic Table of Elements. A table with at the top Hydrogen, Helium, followed by a couple of rows with other elements. These are the basic elements for all materials. The Table embodies discoveries from the nineteenth and twentieth century, discoveries made in many culturally different settings. 94 of those elements occur naturally on Earth; some more have been constructed artificially. Columns in the Periodic Table represent groups of elements that have similar properties, as metals, noble gases, and so on. The Periodic Table and the chemistry it embodies is extremely successful consolidated science. These scientific insights allow for the explanation of materials and the development of new ones, all with the same basic ingredients. This Table is not merely about materials on Earth. Helium was discovered in 1868 as an element by analyzing light from the Sun. This chemical knowledge applies everywhere in the Universe, under a very wide range of conditions qua temperature and density.

Chemical knowledge is directly relevant for biology. Molecules, complex configurations of the elements, make up living beings. They form membranes around single cell organisms, setting up a boundary between inside and outside. Molec-

1 This contribution draws upon earlier publications by the author, on cosmology and limit questions (Drees, 1990), religion and science (1996 and 2010), religious naturalism (2006, 2021b) and the humanities (2021a).

ules are chemically transformed in digestion. Molecules are the stuff of neural activity in mammals. Modern medicine rests upon such insights; that is why we have pharmacies. Scientific disciplines and theories do not stand alone, in isolation from other disciplines and theories.

If we wonder why the elements are the way they are, and hence why the Periodic Table catches something adequate about natural reality, we can dig deeper. Physicists have discovered that elements consist of protons, positively charged particles, neutral neutrons, and negatively charged electrons. Beginning with Hydrogen, with just a single proton and electron, up to Lead with 82 protons, and even heavier elements. Quantum physics explains the configurations of protons, neutrons and electrons that together make up atoms. Chemistry can be reduced to physics.

The Periodic Table describes the fundamental constituents of all living beings and material objects. Some criticize such an understanding of living beings as 'reductionist.' However, if that is reductionism, we better be grateful for it, as it allows for important therapies and remarkable materials. Philosophically, such 'reductionism' could be labeled as well 'holism'—it shows some of the coherence in our Universe. In this context, one can also speak of 'emergence,' as complex configurations arise out of more elementary units.

By way of summary: Chemistry exemplifies the strength of the sciences, a range of disciplines that are intertwined, and that together offer a very successful, theoretically coherent and technologically eminently applicable understanding of reality. Passing by the impressive results of the sciences is intellectually problematical. Not accepting consolidated scientific insights is also a moral failure. Science-denial has deprived some humans of effective anti-viral medicines to treat HIV/AIDS and, more recently, reduce the impact of COVID-19, and of knowledge we need to address climate change and hence the conditions of life for future generations.

However, accepting science does not do away with all philosophical issues. We will consider three key issues: limit questions, the underdetermination of our worldview by our scientific knowledge, and the peculiar position that we, humans, exemplify.

14.3 Unanswerable Limit Questions

In 1868 Thomas H. Huxley lectured "On a Piece of Chalk," on chalk as found at the cliffs of Dover. Why is it white? Why is it soft, so that we can write with it? Why are these cliffs made of chalk? He explains how such questions are addressed in physical, chemical and geological lines of inquiry. Each discipline answers some

questions, while passing on other questions to other disciplines. The image of passing on questions as a disciplinary division of labor, is still a helpful image of the way disciplines work together to develop our understanding of reality. Some questions can be addressed at a particular disciplinary level. But answers give rise to new questions. At each level some questions are passed on to other disciplines.

A child can keep asking: "Why?" So too can the scientist. If we pursue scientific questions as persistently as we can, two lines of inquiry stand out. We have questions about the fundamental structure of reality, its entities and laws: Why is the universe the way it is? At the level of chemistry, the Periodic Table is the answer, but this gives rise to further questions. And so too for questions about origins. Where does the chalk in Dover come from? A question addressed by geology. But then, why is there this planet with those properties? Thus, questions are passed on to astrophysics.

Questions about the structure of reality are passed on until they end on the desk of those engaged in fundamental physics, while questions about origins end on the desk of cosmologist. Cosmology, the astrophysical study of the natural history of our universe, is nowadays to a large extent a regular discipline drawing on the repertoire of established physics, developing hypotheses regarding the conditions in the early universe, tested against a variety of increasingly precise observational data. This has resulted in the Big Bang theory, a very successful scientific theory about the development of the universe. In astrophysical cosmology the issue is to understand the universe as we observe it, applying rules and concepts of physics as we have them. However, the Big Bang theory does not explain the Big Bang itself; we need new physics in order to push the explanatory quest in cosmology further. Such new physics brings one to the more speculative side of cosmology, where the framework itself is in dispute.

At the end of our explanatory quests, questions of physics and cosmology are intertwined. This was brought home forcefully by Steven Weinberg in *The First Three Minutes* (1977): when we discuss the early universe, we need particle physics, and when we want to test particle physics, we need to study the early universe. The earlier a miniscule event in the history of the universe takes place, the larger the scale of its effects in the later universe. To understand the largest scale of the universe, we need to go to the extreme end of high-energy physics. Theories about the fundamental nature of matter are explored for their cosmological consequences. In the quest for a more complete understanding, cosmological research coincides with the quest for yet unknown physics.

The physicist and the cosmologist have no scientific colleagues from an even more fundamental discipline, to whom they might shove off the remaining questions. This particular position of physicists and cosmologists in the quest for explanations may explain why they might be drawn into philosophical and theo-

logical disputes in ways that are less common to geologists, biologists, or chemists. Their work touches upon limit questions to the scientific enterprise, where the explanatory contingency of reality and its laws seems unavoidable. Is there always an earlier moment? Or does 'time' lose its meaning? Or should we understand reality as space-time, and give up the idea of the flow of time? Do we have a highly ordered initial state, or rather a chaotic one?

There are multiple research programs in quantum cosmology (Butterfield and Isham, 2001). Experimental tests and observations may well be insufficient to decide among the various research programs in cosmology. Aesthetic judgments are, at least partly, decisive in opting for a specific scheme. However, what one considers elegant, another may reject. And could a single and relatively simple complete theory be fair to the complexity of the world? Or, as Mary Hesse (1988, p. 197) wrote, is it the case that for "the explanation of *everything* there must in a sense be a conservation of complexity, in other words a trade-off between the simplicity and unity of the theory, and the multiplicity of interpretations of a few general theoretical concepts into many particular objects, properties and relations"? Any simple unified theory will leave something about reality and about itself unexplained.

This may be illustrated by considering the conceptual difference between a vacuum and nothing. Our Universe may have arisen 'out of nothing,' at least without input of any material, that is, out of a vacuum (Tryon, 1973). According to modern cosmology, conservation laws valid for the universe conserve quantities that might add up to zero. Take, for example, electric charge. Negative charges of electrons are matched by positive charges of protons. Atoms are electrically neutral, and so too, it seems, is the observable universe. Similar arguments can be made about other properties: either they add up to zero or they are not conserved. As far as the conservation laws are concerned, the universe might have come from a vacuum However, the equivalence of the Universe to 'nothing' only holds net. It is like someone borrowing a million euros and buying stock for that amount. Such a person would be as wealthy, fiscally speaking, as someone without any possessions. However, the first would be of far more significance to the financial market than the second. When there is the option of borrowing, the financial system is taken for granted. And a physical vacuum may be electrically neutral, but the possibility of having equal numbers of positive and negative charges is there. The vacuum behaves according to quantum laws that allow for the fluctuations to happen, just as the apparent millionaire only can get started once there are concepts of money and of borrowing.

Even the most successful scientific explanations do not explain without remainder. Many forms of apparent contingency may be explained and thus replaced by natural necessity, but such explanations introduce contingency at

other levels, such as the contingency of the general laws and of existence. Science answers many questions, but these answers give rise to further questions. Any explanation has certain assumptions upon which it relies, at a minimum assumptions about existence and the applicability of mathematics. Thus, with the success of science, there are philosophical limit questions such as "Why is there something rather than nothing?," "Why is reality mathematically intelligible?," and "Why are the laws or properties of reality as they are?"

There may be new scientific answers beyond our current horizon. Some questions will be resolved, but limit questions should be expected to arise again and again. In science, we move on in a continuing cat-and-mouse game of questions and answers. Science explains, but it does not explain the most encompassing questions. A theistic answer might be envisaged, but such would give rise to further questions—as any child can continue with 'why'-questions. The theological tradition has resolved this by speaking of God as God's own cause (*causa sui*), or of God's necessary existence. Whatever the intellectual merits of such ideas, discussed in other chapters in this volume, by then we clearly have left the domain of the natural sciences.

14.4 Unavoidable Underdetermination

Not only are there always more questions, including philosophical ones at the limits of science. There is also underdetermination: theories, answers, are not uniquely determined by the data. There may be more than one possibility to work with those data. A simple mathematical example: Even if you have a finite number of data points on a straight line, the line is not implied by those data. There are an infinite number of alternative models that fit these points as well, for instance oscillating curves. We may prefer a particular understanding of measurements—the straight line—but such a preference relies on additional assumptions about rationality, naturalness, simplicity or beauty. Data constrain theories—not all curves fit the data points—but they do not determine them uniquely. And the data are not free from theoretical assumptions either. In physical experiments, measurements rely on equipment and calculations, and those involve theories; they may even involve the same theory that they are supposed to support.

Furthermore, each theory introduces concepts that are as such not in the data. Data in support of Newton's theory of gravity (1687) were the observed positions and movements of planets, but the theory introduced the concept of a gravitational force, a hypothetical entity. With Einstein's Theory of General Relativity, of 1915, this gravitational force disappeared; the theory now envisaged

reality as curved, and particular motions as the consequence of curved spacetime. Though data are essential to science, scientific theories go beyond the data.

And a theory may be interpreted in various ways; worldviews are underdetermined by scientific theories. This phenomenon is best known for quantum theories. How to understand the entities that arise in this theory, such as 'the wave function'? Should we understand it as a theory about our knowledge of nature, about what we will find when we engage in measurements, or does it describe reality as such? If so, does this imply that reality realizes an overwhelmingly vast number of possible states or that reality is fuzzy? What does quantum physics say about determinism? The Schrödinger equation, the basic equation of quantum physics, is deterministic, mathematically. But upon various interpretations the theory allows for multiple outcomes of measurements, and is thus claimed to support indeterminism. But then, a Many Worlds Interpretation treats all states represented in the wave function as equally real, which treats the theory as deterministic, as there is nothing possible that is not realized.

The co-existence of multiple interpretations is not exclusive to quantum physics. Einstein's Special Theory of Relativity describes space and time as a four-dimensional whole. Thus, some have argued that we should understand reality as timeless, as a block universe, without a meaningful notion of a flowing present. But for an observer, there may be a meaningful way to understand the flow of time. And from an empiricist perspective, the four-dimensional universe is a model that goes far beyond the data that can be available to us, ever, as we do not have a point outside space and time, from where we could see the universe as a whole.

Our own position in relation to the scientific image brings me to the third reflection on science, aside of the persistence of limit questions and the underdeterminations of theories by data and of worldviews by theories: How to understand humans, ourselves, in relation to our scientific perspective on reality?

14.5 Categorical Distinctions

We, humans, are material beings. We can be the object of scientific study. No separate ingredients, such as a soul, show up within the scientific study of humans. Within the terms of the sciences, we are nothing but matter. At the same time, not all that is important is addressed by the natural sciences. We are also the ones who study reality, as if we are looking at it from outside. And we evaluate reality, the actions of others and of ourselves, in aesthetic and moral terms. Those are categorically of a different kind than scientific terms. We are biological beings, one form of natural reality, but we may envisage ourselves as outsiders. In reflecting upon reality, we behave as if we are able to observe reality from an external point

of view. Such a *View from Nowhere*, to recall the title of a book by Thomas Nagel, is not accessible to us, but in our imaginative, reflective activities, we assume such a position, going beyond now and here.

The philosophical anthropologist Helmuth Plessner offered one way to reflect upon our reflexive capacities in his *The Levels of Organic Life and the Human* (2019), originally *Die Stufen des Organischen und der Mensch* (1928). Plessner introduces his own conceptual language to speak of human experience and agency. Basically, each living organism is characterized by a metabolism, taking food in and pushing waste out, and with that by a permeable boundary between inside and outside. Thus, with life there arises an inner world, while the organism is within its outer world, its environment. An organism has a particular place in the world; *positionality* becomes a characteristic of life. However, the relation to one's own position works out differently for different kinds of organisms, say plants, animals, and humans. Plants have no center that coordinates actions, and hence no relationship to their own positionality. Animals are aware of their environment and of their own position in it. As they move around, they engage in intentional actions; they have a *centric* positionality. For an animal one might say that it has a body, while it also is that body.

With humans, a further step is made with the emergence of *self*-awareness, awareness of one's own center, and of the possibility that one could have been at a different place or time. In the words of Plessner, "He not only lives and experiences, but also experiences himself experiencing [*Er lebt und erlebt nicht nur, sondern er erlebt sein Erleben*]" (Plessner, 2019, p. 271; De Mul, 2019). In our experiences we may take distance from our own center, which thus might also be 'looked at' as if from outside that center. Thus, one can want to be more one's true self, as if at any moment one is not one's self. Plessner speaks of persons as having an *ex-centric* positionality, given their ability to engage in self-reflection, to consider their own actions as if from an external perspective. And in this self-reflective process as ex-centric beings, we also encounter others, and hence participate in a shared historical, cultural, and social world (*Mitwelt*). We are products of this shared world that precedes us and shapes us, but we are also its creators.

Plessner's imagery and language is just one conceptual vocabulary for philosophical anthropology; others have done it differently, but touched upon similar issues. The fundamental insight is that even if one accepts that the natural sciences are in their own terms successful in describing the world, including humans, there is something about us as humans that requires a richer vocabulary, that takes into account that we are humans who study reality, including ourselves and other humans, who may be influenced by such knowledge, and who act intentionally within reality. A self-reflective vocabulary that I have called elsewhere the human humanities (Drees, 2021a).

In our scientific study, we approach reality in objective terms. In grammatical terms: we use third-person language. But in personal engagement and agency, we also draw on the second person, seeking to understand others, while we cannot avoid speaking from a personal point of view, the first person perspective. We have intentions and values; we act for reasons. From a third-person perspective actions of people may be explained sociologically, as consequences of circumstances and interests. Such explanations do not exhaust our personal existence; they do not do justice to the values we espouse. Why we have those convictions may be explained, but a sociological or evolutionary explanation does not justify them. Issues of justification fall outside the scope of scientific explanations. A classic formulation of this issue is the is/ought distinction, the categorical distinction between on the one hand descriptive and explanatory projects, that deal with what is, and on the other hand prescriptive, normative discourse, that expresses convictions about that we hold which ought to be.

To summarize the discussion of science so far: The sciences are a very coherent and successful way of understanding natural and social reality. But there always will be questions at the limits of science. Furthermore, scientific insights are underdetermined by the data, and the consequences for our worldview are underdetermined by the best scientific knowledge. And our human practices have person-involving features that are not represented within a scientific perspective with its quest for objectivity. Thus, scientific knowledge is very relevant to our lives, to the actions we may consider and the judgments we express, but there is a need for more than science. There is a legitimate role for philosophical discourse.

14.6 Worldviews

Even more than for what it tells, science is informative for ideas that are discarded. The Earth is not flat. The Sun is not being drawn on a chariot, rising in the East and going to rest in the West. Six days of creation, of 24 hours each, have not been enough. Living beings have not been around for a mere few thousand years. Thunder is not an arrow, thrown by an angry god. When Jurij Gagarin, the first cosmonaut, returned to Earth, he had not seen God in space, above the clouds. Up there, no man with a beard, nor a woman, sitting on a throne. More philosophically, given what we know about atoms, it is not convincing to speak of substance as space that is full of matter, infinitely divisible. Rather, substance includes, physically, a lot of empty space. Mythic images, creation narratives and ancient philosophy may evoke poetically a sense of awe and wonder and install in us humility

and a sense of responsibility, but intellectually these are no match for scientific understanding.

The rich variety of life forms has evolved in the course of millions, or even billions, of years, in a process of variation and selection. Neither the variation (mutations) nor the selective pressure is beyond the scope of the natural, as studied by the sciences. Of course, data are always incomplete, but it would be against the scientific ethos to introduce alongside the natural causes someone who tinkers with organisms. Where science faces limitations, the appropriate response of scientists is to develop science further. They will not appeal to miracles, but assume that we do not know the natural conditions in sufficient detail or all laws, or that we have failed to deduct possible implications of those laws and conditions. This attitude may be called 'methodological naturalism' (Perry and Ritchie, 2018). Attempts to find room for God within natural processes, as a factor alongside natural causes, are suspect philosophically and theologically, as they introduce a God-of-the-gaps. Thus, for those who take the sciences seriously, much is excluded, often going against a common sense understanding of phenomena.

Positive consequences for many issues of philosophical interest are less definitive. The Periodic Table spoke of elements; physics understands those in terms of protons, neutrons and electrons. In particle physics, protons and neutrons are understood in terms of quarks, particles that may have 1/3 of the elementary charge of an electron, held together by gluons. And at much smaller scales (or at far higher energies), those may consist of 'superstrings' or of something else; we are in a range where there is no consolidated science yet. What then is matter, the substance of reality, deep down? We don't know. Similarly for other topics of philosophical interest. From consolidated science, that provides a clear constraint on ideas about substance, we come into domains where theories are not settled, their interpretation is in dispute, and the view of reality thereby offered is quite different from the ways at the scales with which we are familiar. Thus, scientific knowledge can serve, negatively, as a constraint upon credible understandings of reality, but does not determine a unique worldview or metaphysics.

As an aside, the sciences not only have an impact on ideas about reality, our worldview or metaphysics, but also on ideas about knowledge. Does science offer an adequate image of reality, or should we rather treat it as models that are pragmatically useful? Thus, should we face some modest form of realism, or is empiricism such as advocated by Bas Van Fraassen (2002) a more honest stance? If so, religious thought is perhaps to be appreciated more for what it does in human lives, pragmatically, strengthening communities, helping us live with finitude and providing moral orientation, than for its ontological truth.

14.7 Theologies

Among the many definitions of religion, a favorite of mine is Clifford Geertz's anthropological understanding of religion. According to him, religious symbols and practices integrate the ways in which we experience and orient ourselves in the world with our understanding of reality.

> Sacred symbols function to synthesize a people's ethos—the tone, character, and quality of their life, its moral and aesthetic style and mood—and their world view—the picture they have of the way things in sheer actuality are, their most comprehensive ideas of order. (Geertz, 1966, p. 3)

Religions integrate models *of* the world, a worldview, and models *for* the world, a vision. Geertz expresses this in an oft-quoted definition:

> A religion is (1) a system of symbols which acts to (2) establish powerful, pervasive, and long-lasting moods and motivations in men by (3) formulating conceptions of a general order of existence and (4) clothing these conceptions with such an aura of factuality that (5) the moods and motivations seem uniquely realistic. (Geertz, 1996, p. 4).

As a definition of the empirical phenomena of religiosity this definition places too much emphasis on the cognitive role of symbols, as contributing to conceptions of the order of existence, bypassing ritual, social and other non-cognitive roles of religious symbols. And the definition suggests a causal arrow from symbols via conceptions to moods and motivations, whereas the symbols may also express moods and motivations rather than establish them. Nonetheless, as a definition that involves the cognitive side of a religion, what could be called 'a theology' (or non-religious equivalent), Geertz' definition highlights the observation that in religious thought conceptions of the order of existence are intertwined with the appreciation of reality and norms for our behavior, moods and motivations. For instance, to speak of the world as God's creation has a descriptive and a prescriptive aspect to it—by speaking of origins it calls for gratitude, humility and care.

In relation to the conception of the order of existence, science has its place—especially given that the worldview should have an 'aura of factuality.' Moods, e.g. wonder, may be influenced by knowledge, or lack thereof, and motivations may relate to ideas about what is technologically possible, and hence to our scientific understanding of reality. Nonetheless, in relation to the 'moods and motivations,' science by itself has less to offer; that touches upon important other spheres of human life.

Thus, science serves as a constraint on some elements of theologies, especially the worldview dimension, but is not fully determinative of them. How then might we think about the divine, if we accept science? I see a spectrum from theism, emphasizing transcendence, to religious naturalism, monistic in ontology.

One option is to assume a radical distinction between God and 'all else,' creation. Upon such an approach, natural reality with its structure and dynamics, as studied by the sciences, is seen as creation. That would be a valid form of 'creationism.' One would not insert divine activity where natural processes could be operative, as if God were in competition with God's created processes, but one would appreciate natural reality with all its laws and materiality as God's creation.

Such a theology can draw on the notion of *creatio ex nihilo*. 'Out of nothing' does not apply to causal processes within empirical reality, but refers uniquely to God's creative causality. God creates and sustains all things as their primary cause. All natural causes are real too, just as are all entities and events, but they are so because they have been created by God. Such real natural causes are 'secondary causes.' This distinction between primary and secondary causality was articulated in the European Middle Ages, for instance by Thomas Aquinas, but its roots can be traced back at least to Augustine. God creates everything—past, present, and future events—and God creates them not as an amorphous bag of events but with their temporal, spatial, and causal relations.

A distinction between God and God's activity on the one hand, and creatures and creaturely activity on the other, might also be articulated as a difference with respect to time: creatures are temporal, whereas God, as conceived in this view, is not temporal. God's eternity is not envisaged as everlastingness but timelessness (Leftow, 1991). Accepting the whole natural world as the creation of a timeless transcendent God may be consistent with a naturalistic view of the world, since it accepts the world as understood by the natural sciences as God's creation. There is no need for particular gaps within the world.

Upon such an understanding of God, one could accept the sciences as explanatory within the world, even though they are not explanatory of the world as such; limit questions are addressed in philosophical theology and not in the sciences. Science offers explanations, but every explanation assumes an initial state and laws. I find such a naturalistic theism a genuine and attractive possibility—that is, a fully science-inspired naturalism with respect to the world we live in and experience, combined with openness to the possibility that this remarkable reality is continuously created by a transcendent God. Such a theism has one major problem, as I see it. It is hard to give reasons, once one accepts a naturalist understanding of created reality, why one would hold such a theological position; "since there are no real 'gaps' to fill, we may be left without an argument for God's existence of the kind that would convince a science-minded generation" (McMullin, 1988, p. 74).

Less dualistic, though still within the theistic tradition broadly conceived, might be speaking of God as Ground of Being. A major figure in the articulation of such a theological position has been Paul Tillich; a more recent advocate is Wesley

Wildman (2006). Another idea is that all of natural reality is in God, even though God surpasses the world, pan-en-theism (Clayton and Peacocke, 2004). I found a most inspiring poetic expression among aphorisms in *The Aristos* of John Fowles (1980, p. 27).

> The white paper that contains a drawing; the space that contains a building; the silence that contains a sonata; the passage of time that prevents a sensation or object continuing forever; all these are 'God'.

Whatever the precise formulation, such positions have more deeply ingrained science-inspired naturalistic presuppositions by seeking to avoid a strong ontological dualism of a transcendent God alongside the natural world, even though they maintain a concept of God as given reality that is not identical with natural reality, but rather its ground or the reality-transcending setting within which natural reality exists, as in panentheism.

There are some positions that may be further removed from theism, as they do not understand God as an entity (or its ontological ground or all-encompassing being) but rather as a symbol used to speak of our existence and the world we live in. Perhaps, one can speak of *The Sacred Depths of Nature*, as the biologist and religious naturalist Ursula Goodenough titled a book (1998).

With all that we now know about 'all else,' science, we cannot definitively decide what should be our worldview and ethos, our theology. In that sense, it seems that with respect to answering ultimate questions an agnostic stance is scientifically most appropriate. That fits well our social reality, with a plurality of human religious orientations. For people who take science seriously, science is a constraint within each of the available religious orientations, often more easily accepted by the more liberal among its adherents. Scientific insights may rule out various ideas about God and created reality. But that need not be perceived as a loss. Religiously speaking, many of the ideas that are to be discarded are 'too small' to be adequate to our knowledge of natural reality and the magnitude of ultimate questions such as the question why there is anything at all.

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