

# Homo metaphysicalis? The biological rootedness of the metaphysical mind

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This article gives a general introduction to reasons why metaphysics might be considered a human constant. The basic metaphysical stance is rooted in human nature and human consciousness, being open to change and continually challenged. The biological rootedness of metaphysics relates to human consciousness, human dualisms, language (especially metaphor) and the fact that humans are self-transcending beings. It is suggested that the dualisms humans experience and express are not foreign to nature and part of the knowledge process. It is argued that metaphysical concepts such as unity, holism and relatedness are still necessary for human self-understanding and understanding of reality. The focus on the exclusivity of the human mind (Kant) contributed to the objectification and eventual manipulation of nature in science and technology and culminated in modernism. The existentialist and nihilistic responses that followed were inevitable. The tacit role of metaphysics in physics is indicated with reference to concepts such as nothingness and the quest for unity. Humans are destined to update their metaphysics in an ever-changing world.

## Introduction: The metaphysical roots of thinking

Metaphysics is as old as human civilisation in the sense that humans have tried to make sense of things since consciousness awoke. Metaphysics is the way we interpret our environment to live and survive successfully. Philosophically speaking metaphysics grapples with the question of being. What is that which is? Why is there something and not nothing? What is the meaning of being? How is being related to origin, destiny, and goals? And there are more similar questions. In spite of many announcements of the end of metaphysics, new metaphysical questions keep on challenging us as we learn more about the nature of reality (e.g. particle physics). The question is whether metaphysics is a human constant or a forlorn phase in knowledge development. Although we criticise traditional metaphysical distinctions, we are destined to replace them with new ones. Luhmann, for example, replaces the traditional distinction of being-nonbeing and being-knowing with a post-metaphysical scheme of system/environment, stressing the place of species in their environment and their interaction with it. He relates metaphysical questions with science (see Moon 2010:105). Present-day metaphysical questions are 'bottom-up', emanating from a new understanding of nature, physics and human biology.

Philosophy in its metaphysical mode attempts to replace opinion about the world with knowledge about the world. Knowledge about the world should not be speculative. The origin of metaphysics in ancient Greece developed against the background of a worldview that already contained the basic dualisms we still grapple with. It represents the foundation for thinking about being. The pre-Socratic cosmologists explained reality through worldly elements and not the gods as causal factor. The human mind was redirected from the heavens (Olympus) to the world of things. This was a huge turn in human history. Knowledge of reality became a human responsibility. The nature of being was related to the nature of things. Albeit speculative, fated to err and prone to self-correction, the triumph was that gullible, accepting minds were replaced by investigating reason. This was an easy process because the 'real' keeps escaping the grasp of human reason. Being came to be understood in its plurality as expressed in the Aristotelian distinction of being as being *per se*, accidental being, being as true and being as act and potency (see Possenti 2014:261).

Moore (2012:1–2) sees metaphysics as the attempt to describe the whole of the universe and give the most general structures of reality; to explain how 'things hang together' in the broadest possible sense of the term; to '... search for the most plausible theory of the whole universe, as it is considered in the light of total science'; and to express the science of things we think can capture the essence of things. This kind of 'holistic' thinking is not restricted to metaphysics as the quest for a 'theory of everything' in physics has shown.

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It is impossible within the scope of this article to do justice to the history of metaphysics or the critique of metaphysical traditions culminating in the so-called 'end of metaphysics'.<sup>1</sup> The aim of the article is to point out that metaphysics is not foreign to the human 'makeup', that it serves a purpose in accommodating proposals about the nature of unknown and improvable aspects of reality and that it is constantly changing as human understanding grows. The article will endeavour to indicate, within the ambit of the science-religion interface that metaphysics has a footing in physics and human biology. Although this may change with new insights, our present understanding still harbours many metaphysical ideas.

### Homo metaphysicalis?

We are metaphysical beings and this can be taken as a human datum.<sup>2</sup> To recognise our *humanitas* is to do justice to human thinking in all its diversity. This means to accept the role of emotion in our thinking, the bodily nature of thinking and how thinking is embedded in our environment. To be human requires a certain construct of reality.<sup>3</sup> We cannot exist without interpreting our environment, and this usually entails some metaphysical construct. The human interpretation extrapolates environment to include the unseen and imaginary forces that co-determine their environment.

We forget that our representation of reality is but a map which can never be reality itself. We mistake map for terrain and our constructs for reality. It was a great step to realise that our perception of the world does not necessarily represent it.

Where non-rational species interact intuitively with their environment, human interaction with their world is more complex. We seemingly cannot avoid asking ultimate questions:

... we are driven to understand whatever we can about our place in the world, even if what we do know, or might discover, represents only a small and superficial part of the enigmas of nature. (Unger & Smolin 2015:x)

Before the advent of science it was especially religious and metaphysical constructs that informed us about our world. These constructs were intuitively informed. Science is usually counter-intuitive and senseless to common reason. The question to be addressed is whether science has replaced metaphysics, if science is free of all metaphysics

1. Metaphysical developments in the 21st century act as example. The linguistic-turn and the contribution of logical positivism did not focus on the wider question of the meaning of being but on nominalist issues like meaning in logical and linguistic context, the nature of natural kinds, the reality of possibilities, etc. Cognitive and brain sciences have contributed much to our self-understanding as well as efforts to overcome mind-body dualism.

2. Max Scheler (2008:13) described metaphysics as the activity of the total human being, mentally and spiritually.

3. Kant viewed metaphysics as belonging to man's nature (Heidegger 1970:56). This can be understood when we consider the nature of the human mind and the way we think which can be typified as the transcendent nature of consciousness. He modelled the transcendental ego indicating how reality fits our mind structures. He linked the reality question with the question of what thinking is and what mind is.

and if metaphysics still has any place in human thinking and self-understanding.

### Metaphysics, dualism and language against the backdrop of human biology

Recognising human biology can give metaphysics a new focus on a neglected aspect of reality. Human affect co-determines any thinking. To understand metaphysics against the backdrop of human biology does not mean that one reverts to some kind of vitalism or animistic thinking. Bergson acts as example. He endeavoured to place thinking man back into the 'real' world again to experience the world 'from within'. Intellectual intuition must take the place of intellectual analysis. In this sense metaphysics could dispense with symbols and represent reality from 'within' (see Possenti 2014:79). Bergson's reality is consequently exclusively individual reality. There could exist as many intellectual intuitions as there are people around without anyone knowing if his or her intuition about reality is at all real.

Human biology is determinative of the questions we ask and the answers we give. To a large extent this is determined by the nature of consciousness and the transcending mind. We move from mind to reality, from self to world, from inside impressions to outside experience, from outside impressions to inside explanation, etc. Human attention (*sensum*) for example is informed by the senses and constituted by an interaction with our immediate environment. Our attention comes up and is co-determined by biological internal 'forces' of organisation, which operate automatically without our awareness (see Harris 1965:333–334).

The nature of human consciousness is central to the question of being and thinking. Of all species it is only the human that grapples with dualisms. The ideal to overcome our dualisms evades us. Dualism manifest in the following distinctions: mind-body; inner world of thinking - outer world of things; subject-object; essence-existence; potentiality-act; thinking subject-extended object (*intellectus-res*); thinking-feeling; mind-brain; realism-determinism; '*ding-an-sich*'-'*ding-für-sich*'; top-down thinking-bottom-up thinking; fantasy-fact; believe-proof; and so on. *Ontos* [what is] has a dual nature: matter-form and essence-*esse*, where *esse* represents the act. This dual nature can also be expressed as essence and existence. There must be constant movement between the two as far as the human person is concerned as existence informs essence and vice versa. Because God is perfect, his essence is complete and essence and existence become one. Essence and existence are divided in humans.

All things have a specific quiddity, a 'whatness', but *what* something is different from *that* it is. Apart from the essence of something and its 'thatness', one can also distinguish the way it exists. Possenti (2014:261) explains that in Aristotle's ontology, act is the being-in-act of form or an operative potency, it is not *esse*.

The way something exists and acts actualises its potency similar to the way that form actualises matter. Thomas saw existence as logical prior to essence (see Aquinas 1997). Possenti (2014:259) stresses the evolutionary importance of act and becoming because it adds mutation to the idea of creation, stressing becoming, acting, and is similar to the Aristotle's distinction of the efficient cause. The notion of becoming is basic to metaphysics. Plato wanted to free being from becoming and its transience through his eternal forms. Aristotle introduced the notion of *energeia*, which opens being to the realm of change, becoming, and emergence (see Possenti 2014:135).

The dualism between substantialist ontology and relationalist ontology is perhaps artificial. There is something substantial to every relation and something relative in everything substantial. The same can be said for the dual essence-existence distinction. Reality cannot be constricted to the essence of things. Nothing exists in isolation. Relation (*actus/Energeia*) marks reality. We have the counterpart in the particle-wave distinction in physics.

### Dualisms as biologically given?

Dualisms are a biological given. Life is characterised by openness, adaptation and change, and this involves dualism – moving from what is to what may be without necessarily letting go of what is. The same goes for acts of transcendence. Transcendence does not necessarily imply evacuating the present to explore the new. When we do discard a present belief, knowledge or situation for the new, there is no guarantee that the new will not sometime experience the same fate.

We construe dichotomously, and this is analogous to metaphoric thinking. We need a lens through which to see something new. We try to understand the foreign in terms of the known. Raskin (2008:17) refers to the dualistic trait of human thinking in the mode of 'as-if' constructions which the human brain has evolved to organise experience. This forms part of human meaning-making mechanisms and is similar to metaphor where the *tenor* [idea] and *vehicle* [image] are always kept in creative tension. Once the unknown has become familiar, new metaphors and different dualisms await. This accords with the basic insights of evolutionary epistemology.

In our evolutionary development our consciousness has evolved with the ability to construe models and events that fit our social, natural and historical environment. We also have the ability to consciously reflect on our models, critically engage with them and adapt and change them.

One must distinguish between the 'biological' inevitability of dualism, given the nature of the human mind and established dualisms. Dualisms once established can and should be criticised and eliminated when they have served their purpose. The human mind always oscillates between what is and what is possible.

Becoming characterises human history and self-understanding. We cannot escape our subjectivity and the way our minds impose meaning on reality. But this is not static. Thinking can be objectified in mathematics and scientific theories, formulas and laws, but the human thinking itself is a continuous self-transcending phenomenon, linked to the kind of species we are.

Not only have people evolved biological structures – those structures have given rise to psychological capabilities such as the ability to imaginatively construe events.<sup>4</sup> The evolved ability to construct a coherent image of reality also allows people to change them. Social institutions and practices (politics, economics, family life) evolve in line with our psychological perspectives. The evolution of knowledge seems to be gradual. New inventions and solving mysteries seldom come at once. There are a thousand ways we discover not to develop something before it is successfully designed. Ideas may linger long in our minds before they are realised. In this regard Raskin's (2008) comment is pertinent:

... we need not hold knowledge in abeyance until the possibility of knowledge is established or until indubitable first principles or incorrigible sense data are established upon which to build. Instead, we should simply embrace that all knowledge inevitably springs from a perspective. (p. 6)

This approach can be called critical hypothetical realism. Analogous to evolution our progress may be 'blind' (see chance), but it is not random. Raskin (2008:6) sees blind variations as random and determined by factors like chance and mutation, but they are also anticipatory, similar to the development of new scientific hypotheses that build upon previous knowledge and experience. We may go blindly into the unknown but not without anticipation and hope and when we stumble upon something that holds promise we exploit it. This is the fibre of metaphysics that follows evolutionary lines. Reality in its most basic level seems to be dualist. This is the picture we get from physics. Apart from the wave-particle distinction, a particle can be in more than one place at once and move in more than one direction at the same time (Brooks 2013:211).

### Language (metaphor) emerges from the physical

Metaphysics is unthinkable without language<sup>5</sup> and its basic metaphorical structure. The basic metaphoric structure of language refers to the dualism between word and thing (*signifiant* – the acoustic image of the word, and *signifié* – the mental concept of a something); between known and

4. Something analogous happened on the level of basic organisms that developed something more than strict responses to genetic instruction. Organisms generate, according to Ward (2010:288–289), a new kind of 'semantic' information that involves consciousness, interpretation intention and understanding.

5. Possenti (2014) imposes a distinction between language (as predominantly fixed in concepts) and being as perceived on a primordial level: 'Because being is act rather than 'word' or 'language', the perception of it is open to men and woman of every epoch and civilization, insofar as it is embedded in a level of knowledge more basic and primordial than that of language ... It is not due to language that we live in the realm being, but rather our capacity for a transcultural intellectual intuition, which pertains to the conceptual-revelatory order of thought' (p. 315).

To make this statement in a credible way he needed to compare language-deprived humans with speaking humans.



unknown; between tenor and vehicle. Metaphor is analogous to the evolutionary principle of building upon proven past experiences. It is a linguistic way of resolving dualisms (without necessarily resolving them) and of 'accommodating' paradoxes. The brain is structured to think metaphorically because it reads the unfamiliar in terms of the familiar. Language develops from my experience of being embodied and how my body interacts with and experiences the environment. Lackoff and Johnson (1999:74ff.) have indicated the biological grounding of metaphor in human bodily movement, physicality and experience. They see the embodied realism as the cornerstone of conceptualisation (Lackoff & Johnson 1991:91). To move from what we 'know' in order to grasp the unknown and mysterious includes many other cognitive abilities like will, imagination, desire and phantasy. This again may be driven by biological factors like love, fear, scarcity, want and inquisitiveness.

We want to have a coherent picture of the world, reality to 'really' exist as we understand it and our causal constructs to be as we imagine it. To deny reality is to deny our bodily existence. To come to terms with reality is to come to terms with our place in it. Metaphors characterise 'reality-talk' as well as 'God-talk', the immanent and transcendent. Religions depend on metaphors to express metaphysical ideas about the transcendent. The metaphysical god and the religious one inevitably share the same goals: to act as origin/cause of all things, 'explain' why things are the way they are and how humans fit into the greater order of things. Metaphor, dualisms, paradoxes, etc. abound in metaphysical and religious discourse. In similar vein the natural sciences cannot operate without the use of models, metaphors and conjectures.

## Unity, holism and relatedness as metaphysical concepts

Metaphysics contribute to worldviews. Worldviews form the backbone of metaphysical thinking. Worldview accords with the wish for integrated understanding. We want to relate things. Where it was previously done in abstract idealistic terms, realism and the nature of the real are presently the challenge posed especially by physics. Christian theology, for example, developed a neatly integrated picture of reality from its miraculous beginnings to its eschatological completion. This stands in grave contrast to the picture of reality presented by the sciences. Of course there are various perspectives on reality, and they operate on different planes. Physical explanations are on a different level than mythical, moral or metaphysical explanations. McGrath's brave claim on science as *ancilla theologiae* probably sounds atavistic to physicists.<sup>6</sup> Science rejects both philosophy and theology as metaphysical. Science remains human science, and once the human factor is introduced, diversity, dualism, paradox, metaphysics, etc. enter the scene as well. The physical

sciences can never survive on an isolated island ignoring the human side of existence.

Mind is linked to body and rationality to our biology. Species are embedded in an environment, and our planet's fate cannot be isolated from the broader horizon of our solar system or galaxy. Physical relatedness is stressed in ecological terms where all life forms are seen to be in some way directly or indirectly interdependent and where no life form can be understood apart from its physical environment. The interrelatedness of all earthly life forms is underscored by the genes they share to a larger or lesser degree. On the level of physics *entanglement* has become metaphor for relatedness on a quantum level. Unity, holism, relatedness and similar terms are often metaphysically informed. The idea of a *nation* is a metaphysical and not a physical reality. This is valid for many abstract concepts as well.

Worldviews are intangible but real. No one really determines the outcome of it, and it is difficult to accurately describe any specific worldview in all its variety. Collective societal memes co-determine and inhabit the worldviews which are dynamic and changing. Societies need some overarching ideas to bind them together so that they can function more or less successfully. The impact of a worldview is reflected in a society's religions, politics, media, education system, science and so on.

The individual natural sciences seldom aspire to unite human knowledge. Previously it was the task of philosophy to formulate an overarching worldview while the various religions each proclaimed their own and exclusive salvific truth. Max Scheler regards philosophy as approaching what we know of the world from a different vantage point than the various sciences. Philosophy views knowledge holistically '... allocating a particular place within this totality of things to what each individual science contributes' (Scheler 2008:13). Scientists themselves are generally aware of details only in their field of specialisation. The big question is who or what kind of 'invisible hand' translates the findings of the various sciences into an integrated picture that determines our world-view. How do the various sciences guide human perception in spite of all its differences towards some kind of 'outcome' that we interpret as progress, or a standard view or the best way forward? No worldview is fully coherent as it is made up of various conflicting perspectives. How these perspectives compete, and which one becomes the dominant societal 'meme' is apparently up to the 'invisible hand'. The voice of the 'scientific expert' remains powerful in present-day societies although it does not go unchallenged and no one can guarantee that this voice will be correctly contextualised. The ongoing controversial debate on climate change is an example.

For Harris (1965:29) a comprehensive knowledge of the world can only be given by the natural sciences. None of the natural sciences aspire to formulate a comprehensive picture of the world. There runs a thread from cosmology to physics, chemistry, biology and psychology, but this is not

6. See the 2008 dissertation of Dew, James K., Jr.: *Science as the ancilla theologiae: A critical assessment of Alister E. McGrath's scientific theology from an evangelical philosophical/theological perspective*. The important contribution of McGrath is to claim natural theology back as legitimate part of theology. The dissertation can be accessed at <http://gradworks.umi.com/33/13/3313301.html>

comprehensive. It is left to metaphysicians, '... to form as complete and systematic a conception of the world as available evidence permits' (Harris 1965:29). Science could adopt a non-transcending position by accepting that there does not exist anything that science would not in principle be able to comprehend, at least within a closed universe model. In a multiverse model everything may be different, and unknown laws may apply.

Philosophy may aspire to interpret reality, but a meaningful interaction with the natural sciences is lacking. The picture from the side of philosophy refers to the various sciences but seldom interact with them while the sciences formulate their findings without any acknowledgement of metaphysics. Harris (1965:452) criticises the approach of the sciences as 'monistic'. Deloria (2012 [1979]:23) values metaphysics as an area of unification 'because the methodological assumptions of Western knowledge are designed to maintain this isolation' (between science and metaphysics/religion).

## The metaphysical priority given to the human mind

Without denying the pivotal contribution of Kant's philosophy it can be said that he contributed, perhaps without intending it, to the neglect of the object and the emergent misuse of nature in industrial, technological and scientific developments. Kant's philosophy represents the 'inward turn' towards the transcendental subject. It is an important development in a process that culminated in the modernist abuse of nature. The realist-idealist dichotomy has dire consequences for nature. Both scientific realism and metaphysical idealism can be accused of having contributed, intentionally or not, to the economic mistreatment of our planet. Kant and the idealist tradition implicitly set the scene. The role of positivistic realism will be dealt with under a brief discussion of modernism.

The quest for truth in the mode of epistemological certainty came to its apex in Kant who neglected knowledge of the object (*das Ding*) in favour of the knowledge of the mind (*Vernunft*). He stressed in his prolegomena to any future metaphysics that, '... metaphysical cognition must consist of nothing but apriori judgements' (Carus 1949:14). The sources of metaphysics are limited to the *a priori* which are expressed in the form of synthetical judgements *a priori* (Carus 1949:24, 179). All knowledge of purely formal thought is in itself empty and sense-experience in itself is blind; the two combined form the essence of experience, which alone gives access to the nature of things (see Carus 1949:172). In separating the sensory from the purely formal (mind) Kant hoped to establish the universality and necessity of the purely formal and its principles. The sensory is incidental, particular, concrete. The human mind does not represent things/reality 'as they are in themselves'. These are determined by the categories 'given' by the human mind. He thus limited the formal (how things are) to the subject while it obviously cannot be isolated from the objective. It is both subjective and objective that makes science, i.e. objective

cognition, possible (see Carus 1949:199). Kant's emphasis on the transcendental Subject subordinated reality to the human mind. Reality 'reveals' itself to fit the structures of the human mind. Mathematics represents this well.

## The metaphysics of modernist realism

### Bohr's anti-metaphysical stance representing the natural sciences

Bohr (1885–1962) is important because his atomic model is still paradigmatic in science although it has been significantly extrapolated. He represents modernism in the mode of scientific realism. Niels Bohr rejected metaphysics unequivocally. He grappled with the basic philosophical positions of dualism, idealism, realism, critical realism and rejected any form of metaphysics without any reservation. What is significant is that in spite of the exclusivity of realism, the human with its subjective baggage takes centre stage. The quantum world in all its confusing bedazzlement depends on the measuring human.

The interpretation of the quantum world brought the place of the human subject (observer), of human consciousness, of measurement, of the subject–object correlation to attention again. The problem with understanding the quantum phenomenon is that scientists had only models, measuring apparatus and methods linked to the classical mechanical approach to reality to work with. Bohr insisted on a classical description of the measuring apparatus, which was branded as a 'positivism of higher order'. Bohr stated:

... there can be no question of any unambiguous interpretation of the symbolism of quantum mechanics other than that embodied in the well-known rules which allow to predict the results to be obtained by a given experimental arrangement described in a totally classic way. (quoted in Shimony 1993:25)

The problem with a 'positivism of the highest order' is that of understanding the ontological status of macrophysical objects which seemingly 'exist' objectively with intrinsic qualities. But in quantum mode they cannot exist independent of human observers, and their intrinsic qualities cannot be known because of the uncertainty principle (Shimony 1993:26). Shimony (1993:183) depicts Bohr as an idealist who regards the contents of consciousness as 'the fundamental reality, and all physical discourse as merely an instrument or short-hand for summarizing, systematizing, and anticipating these contents'.

### Optimistic modernist metaphysics and the existentialist revolt

With modernism reality came under human hegemony in an unprecedented way. Modernism stands for scientific realism, empirical proof and pragmatic outcomes. It discards metaphysics as useless speculation and relegates human success to scientific inventions and human economic flourishing. In a sense Modernism represented the pageant of metaphysics in the mode of the *Übermensch*-dream under

influence of its techno-scientific successes. Modernist metaphysics supervenes on the human techno-scientific interpretation of the world. The World Wars were a horrific wake-up call and we woke up in the bed of metaphysical nihilism. Degrading nature had to affect humans as part of nature. Nihilism cannot be understood separately from our embeddedness in our environment. Annihilate nature and you annihilate humans:

This climate fosters the subject's experience of 'thrown into being', as if he came out of a primordial nothingness: the same primordial nothingness to which he is destined to return. (Possenti 2014:317)

Nihilism maintained the dualisms between humans and world and between man and his nature. Present-day eco-concern is the siren, to which many must still wake up.

Once humans learned to siphon energy from nature, the exploitation of the world surged. '*Being*' lost its mystery, and was instrumentalised and objectified in human production. Modernity represents a radical break: '... the break between man and world, between thought and being, between man and God, and between nature and freedom' (Possenti 2014:317). Once the Kantian *Ding-an-Sich* [nature] was interpreted as unknowable, humans were isolated and alienated from nature. But human dominance came at a prize.

The horrendousness that accompanied modernist success in the World Wars was reflected philosophically in existentialism (Heidegger, Sartre, Kierkegaard, Scheler) and theologically in dialectical and existential theology (Barth, Tillich). Existentialism is not anti-modernist but expresses the meaninglessness of modern successes.

Heidegger made an existential turn in ontological thinking. He saw metaphysics as the grounding experience of human existence (Heidegger 1970:43). Heidegger neglected the object as Kant did. He reinterpreted Kant by temporalising his transcendental philosophy. The temporalisation of being is the historicisation thereof. He redirected the question of being from the physical world (*Seiendes*), to being as being human. We find in Heidegger a turning away from the object as object to a kind of relation-less presence (being-there/*Dasein*). He was intensely critical of technological advances. His existentialism trumps metaphysics<sup>7</sup> insofar as it is diverted by everyday realities. Being is situated in the temporal, the fleeting now, which relativises human control of being.

Heidegger has radicalised the worldly, temporal and finite character of being and sidestepped the sphere of metaphysical objects (Possenti 2014:142). He moved away from knowledge and knowledge of the thing in itself in favour of the self-comprehension of Being-present, being-in-the-world and the way humans strive in this situatedness (*Geworfenheit*) for

meaning: 'Meaning is an existential of *Dasein*, not a property attaching to entities, lying "behind" them' (Heidegger SuZ §32, quoted by Possenti 2014:138).

Both Heidegger and Barth stressed the impact of nothingness (*das Nichts/das Nichtige/Das Nichts nichtige*) in the context of meaninglessness and evil. Basic to the bafflement of human existence is the presence of nothingness (Heidegger 1970:43). Although metaphysics focuses on the question of being, the question of 'nothingness' (*nicht-Sein*) encompasses all metaphysical thinking (Heidegger 1970:42). It is the threatening alienation from being which revives amazement in us.

Against this background metaphysics serves as a heuristic tool. Postmodern metaphysics represents metaphysics in its self-deconstructing mode. Metaphysics reflects the dual nature of being as well as that of *différance*. In the sense that metaphysics 'accommodates' dualisms and paradoxes and reflects being in its varied manifestations in the mode of *différance*. *Différance* is similar to non-being. Moore (2012) sees the metaphysical aspect of *différance* as follows:

Like Being, it is not itself being. It is never present; not because it is somehow transcendent ... but because it acts as a kind of precondition for any presence. It is what makes the opposition of presence and absence possible. (p. 532)

## Modern physics cannot evade metaphysical questions

The reality-thinkers of our time seem no longer to be philosophers or theologians but physicists. Science explains reality (creation) without invoking any transcendent agent or creator-God. The universe is a 'self-making' system. Science proposes to explain the development of reality according to established physical laws and processes that are self-explanatory. This is not to say that science has all the answers. The basic 'why-questions' remain, and they entreat metaphysical constructions. The kind of questions generated by physics in dealing with reality as it is understood today relates to classical metaphysical disputes like ontology, being-nonbeing, unity, causation and so on.

What caused the universe (Big Bang)? What was prior to the Big Bang? Where does the basic matter/energy come from? What is the relation between energy and information as the universe can be conceived in terms of information? (see Davies & Gregersen 2010:3, 319ff.). Can everything be reduced to nothing because all come from nothing and may collapse again into non-existence again? What is the nature of 'nothingness' (e.g. the notion of a vacuum<sup>8</sup> and the paradox of the energy it contains)? What is the nature of chance<sup>9</sup> that seemingly determines everything? Why does a certain kind of species emerges and not another? Why is a-symmetry necessary for creation? (Gleiser 2010:101ff.). How does the

8. To quote Davies (2013:133), 'Nature may abhor an absolute vacuum, but it embraces the quantum vacuum with a relish'.

9. Lakoff and Johnson (1999:220) see uncertainty as linked to our use of probability and the use of the distribution metaphor. In this sense the existence of the universe is a gamble – an idea expressed by Einstein's question: 'Does God play dice?'

7. Heidegger links existence to philosophy: '*Voorzover de mens existeert, geschiedt op zekere wijze het filosoferen*' (1970:43, 72).



quantum world translate into the macro-world in which we live and how does quantum reality determine what it is to be consciousness (if at all)? What is matter (and humans as 'thinking matter') and is the universe in a way conscious as panpsychism suggests? What is the nature of infinity (parallel universes)?

Mumford and Tugby (2013:4) refer to Kripke (1972) and Putnam (1973) who have indicated that science is dependent on metaphysical assumptions. They have pointed out that it is an *a priori* necessity that water must have two hydrogen and one oxygen atoms and that this identifies water as a natural kind. This brings Mumford and Tugby (2013) to define the metaphysics of science as:

the philosophical study of the general metaphysical notions that are applied in all our scientific disciplines, disciplines which offer novel predictions and provide explanations of new facts and anomalies within their given domain. (p. 9)

These general metaphysical notions include concepts like causation, law, kind (e.g. species), emergence and others which order reality. The notions of natural kind, natural law and causation are so 'inherently' part of the scientific endeavour that one often forgets their metaphysical underpinnings. Natural law, natural kind, local causation and emergence are phenomena that science tries to pin down without being able to say why they are so and not different and whence they come. 'Chance' seems to be the regular answer and traditional metaphysics detests chance.

Searle 1998 puts the difference between science and metaphysics as follows:

Science is systematic knowledge; philosophy is, in part, an attempt to get us to the point at which we can have systematic knowledge. This is why science is always right and philosophy is always wrong-as soon as we think we really know something, we stop calling it philosophy and start calling it science. (p. 16)

This underscores that metaphysical notions usually come into play in the pre-scientific phase of thinking about phenomena. Here human imagination ponders uncertainties and the inexplicable aspects of reality and constructs various possibilities (manifesting in metaphors, models, conjectures). These are discarded on the scientific level, but their influence cannot be ignored. Metaphysical scaffolding in science collapses once it has fulfilled its role – although this is usually the case with detailed problems while it remains when we address the bigger picture of reality.

## Nothingness/nonbeing

The question of 'nothingness' is basic to the investigation of physics and prominent in metaphysics. Nothingness is ordinarily understood as meaninglessness. But *nothingness* is not nothing in physics. Particle physics has revolutionised the concept of being and introduced a new view on nothingness that yields ontology without an *ontos*. Here *ontos* represents what is tangible and concrete. The tangible and concrete need not be physically manifested although the

same forces and energies are present. The existence of our universe is almost preposterous if one take into account the extremely special initial conditions that were valid. For the creation of a universe there need to be specific relations, specific symmetries and anti-symmetries<sup>10</sup> influencing the specific relations of fields, forces and laws. Particles collapse anti-particles and matter anti-matter, yet matter (particles) regains the upper hand against the infinite void. Particles pop in and out of existence all the time – yet we are here trying to fathom the infinity of galaxies we observe against our cosmological horizon.

Holt (2012) sketches the following scenario of a zero-energy universe:

Suppose the total energy of the universe is indeed exactly zero. Then, owing to the trade-off in uncertainty between energy and time (as decreed by the Heisenberg principle), the indeterminacy in its time span becomes infinite. In other words, such a universe, once it popped into existence out of the void, could run away with itself and last forever. It would be like a loan of pure being that need never be repaid. (p. 142)

No 'primary matter' serves as the basic stuff out of which all else is composed. The deeper one pursues explanations, the more non-materiality reveals itself in (or behind) the solid objects around us (Clayton 2010:58). All of this may suggest that materialism is an illusion. But this is not accurate. Clayton suggests a combination of matter–energy: 'Relativity theory in cosmology and the complementarity thesis in quantum physics suggest that the basic reality is some sort of hybrid "matter-energy"' (Clayton 2010:57). Along the same lines, McMullin (2010:25, 34) states that if matter is to be retained there are two alternatives open. Matter must be broadened to include mass-energy, or it could be restricted to rest mass which leaves the world with two constituents: matter and energy.

Science can be captured by the metaphor of 'measurement'.<sup>11</sup> Without measurement there can be no science. But it is human measurement and therefore relative to human epistemologies, methodologies and instruments. As Gleiser put it, 'We may not be the measure of all things but we are the only things that can measure' (2010:249). We capture the outer world with measurements designed by mind, and in this way reality 'conforms' to the human mind.

To find a fixed Archimedean point in a changing world, and to express our belief in causality philosophy reverted a 'First Cause' – a transcendent conductor to guide the process of knowledge integrity. The First Cause differed from one system to the other. Examples are: The Prime Mover, the

10. Another factor that makes the existence of the universe almost improbable is that it is highly asymmetrical (Smolin 2015:354–355). Entropy is a good example of this asymmetry. Entropy is however strongly time dependent. The place of time is crucial in the history of the universe although physical laws are reversible in time.

11. Mathematics complements scientific measurement. Physical processes depend heavily on mathematical explanations. Mathematician Sir Roger Penrose and cosmologist Max Tegmark saw reality as mathematical in essence. Mathematics is the science of structure. It is uninterested in matter (stuff). Thus Holt (2012:189) deduces that if the universe is structured all the way down, then it is characterised by mathematics. If reality is mathematical then reality is metaphysical, thus number, equation, symbol, as Democritus already argued.

Neo-Platonic One, the Cartesian God (the thinking subject as platform of all clear and distinct thought guaranteed by a non-deceiving God), the Hegelian Absolute/Geist, Spinozian Substance, Leibniz's pre-established harmony (where all substances harmonise with each other).

## Physics and the metaphysical quest for unity

A classical metaphysical challenge is to relate parts to whole, formulate an integrated theory of meaning, and attain knowledge integrity. Unity means integrity, but it is not without its problems. The following questions come to the fore. Is there an ultimate set of entities which are basic to everything? If we know the properties of the parts and the laws governing them are the properties of the composite system then fully determined? How must the emergent properties of composite systems be understood if they differ radically from that of the components? Are composite systems of a natural kind? Are the possible and actual taxonomy of natural kinds explicable? Is there a hierarchy of levels of description each with their own laws? (see Shimony 1993:191).

Unity is a huge challenge in physics. There is a flow of new information that needs to be integrated into existing models. Unger and Smolin (2015:353) go so far as to talk of the present state of the scientific understanding of the universe as 'Cosmology in crisis'. The problem relates to a unified theory. Smolin (see Unger and Smolin 2015:354) attributes the crisis to the inability of the models formulated in the 1970s (all relating to the standard model of Bohr) to be integrated into a unified physics. Ideas basic to the standard model like unification via symmetry and the breaking out of the symmetry (gauge model) have not helped much towards an integrated picture.

This problem is identified by Unger and Smolin (2015:356) as the problem of relationalism. Without relationalism relativity would be impossible. But Smolin (2015:356) says not every property can be a relation because there must be intrinsic properties to be taken account of in a relation. Relation is thus complex and not simply unilateral. Relation usually involves a whole network of relations. Another paradox is that relations are at odds with natural law because relations are changing and dynamic while natural law implies timelessness and immutability. Smolin (2015) comes up with a radical answer:

The path to resolve the crisis of relationalism is then to make the laws themselves subject to change and dynamics, that is to embrace the reality of time in the strong sense that everything changes, sooner or later; everything is in the throes of dynamics and history – even the laws of nature. (p. 356)

It is an almost insurmountable mathematical challenge to deduce the properties determining the composite system from all the basic laws that determine the parts (Shimony 1993:192).

## Conclusion

To discard the metaphysical dimension of our thinking and our representations of reality would mean to discard the human. Metaphysics will always be part of human thinking. Metaphysics is a heuristic tool, scaffolding that we discard when we have clarity about the unknown. Metaphysical thinking will always be 'post-metaphysical' thinking in the sense that we differ from what was previously said. Reality could perhaps be capsulated in endless mathematical equations – but that would not be human reality. The advantage of metaphysics is its open-endedness and the fact that we realise previous one-sided aspects in our thinking, be it the concepts of mind, the positivist realist position, transcendental idealism or logical positivism. The natural sciences do not sacrifice any integrity on the altar of metaphysical thinking which serves as aid in the quest for understanding. As far as theology is concerned the challenge is to keep on relating belief in the transcendent with aspects of immanent reality. Theological thinking can only benefit from incorporating realism and the realism of the self and its biological connectedness, into its thinking.

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