

**A Thomistic exploration of the unity of Truth in the science and
religion dialogue: seeking oneness of the human experience**

by

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I
Declaration

I declare that the thesis, *A Thomistic exploration of the unity of Truth in the science and religion dialogue: seeking oneness of the human experience*, which I hereby submit for the degree Doctor of Philosophy in Philosophy at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution. Where secondary material is used, this has been carefully acknowledged and referenced in accordance with university requirements. I am aware of university policy and implications regarding plagiarism.

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II
Summary

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This study sets out to reclaim the ontological epistemology of Saint Thomas Aquinas which serves as a unifier of knowledge in being, within the philosophical milieu of being's forgottenness. Post-Humean and Kantian thought made appearance rather than being solely accessible to the thinking subject. The consequence has been the marginalisation of being as reflected in truth – influenced by scientific and postmodern paradigms – which has contributed to both the paucity of meaningless metaphysics, and the conceptualisation of science and faith as necessarily opposing categories. To the end of establishing that science and faith have points of intersection, it is argued that the reclamation of Thomist natural philosophy leads to the defence of a clarified form of realism. Establishing the “real” implies that the metaphysical dimensions of the problem of existence can be explored. Within this realist model, the “pre-Modern” Thomistic theory of “*scientia*” is employed to bring physical and natural science and metaphysics into relationship as components of true knowledge of being. Consequently, the author puts forth that “*scientia*” is exemplified in, amongst others, the particular science of cosmology since the rudimentary point of engagement between physical and metaphysical science occurs in the act of creation, that is, when being comes into existence. Whilst metaphysics is often disregarded, it is consistently proposed that the causal nature of being demands – by its presence – a more robust account than physical and natural science can offer. The contribution made by this work rests in its ontologically-formed

epistemic typology whereby “hard” science and faith are related in boundary areas of knowledge, that is, when metaphysical problems emerge from within physical and natural science. By reimagining “hard” science and reasonable faith within “*scientia*”, both approaches are conceived as adequating to truth when their content is reflective of being.

Key terms:

Causality, cosmology, history and philosophy of science, metaphysics, philosophical historiography, philosophy, philosophy of nature, philosophy of religion, Scholasticism, Thomism

III

Dedication and acknowledgements

To the praise of Almighty God, Creator of all things, Source of Being and Fount of Wisdom,

I dedicate this work to:

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Callum David Scott
City of Tshwane, South Africa

2014

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CHAPTER 1: Introduction

“All religions, arts and sciences are branches of the same tree. All these aspirations are directed toward ennobling man’s [sic] life, lifting it from the sphere of mere physical existence and leading the individual towards freedom” (Einstein, 1993:7).

1.1. Preamble:

The impetuses behind science and faith have their common source in the thinking subject immersed in, approaching and apprehending the real. This source is indicative of the unity of being. However, the experience of the real can only ever be from the perspective of the uniquely socialised, individual thinking subject. Reality thus becomes epistemologically bound by the subject’s limitations, but always remains ontologically objective.

As it stands, ontologically, the cosmos is a complex and irreducible whole. Adequate understanding of it, hence, requires the acknowledgement of this state. However, the corpus of knowledge the human has of the universe is exceedingly limited. It will thus be proposed that in addition to limited and non-exhaustive, “hard” science, alternative, complementary reasonable approaches to comprehending reality from a human position must be put forward. Among these, it will be offered, is faith. In contradiction to the perspective that will be argued for, though, scientific “New Atheism” has gained considerable popularity and influence in recent years, shedding a vastly different light on the context.ⁱ

Against the might of reductive scientism, we suggest that a more nuanced epistemology of ontology is required. In a very particular way, it is apparent that the scientifically inclined leave a gap in their reasoning in not considering causality as an important theme. It can never be discounted, we assert, that in every moment of existence, all that is, requires explanation for its being. A satisfactory account of reality should therefore be open to what transcends the limits of the explanatory power of the scientific method into explanations of reality.

However, it is predictable that developing systems of knowledge not solely empirical will be met with disdain by the above mentioned reductivist school of thought. Moreover,

fundamentalist faith positions – such as creationism and the intelligent design movement – are not supportive of the position put forth. After all, their standpoint denies the validity of scientific theories, despite the available evidence.

1.2. Rationale for the study:

This study arose after careful examination of the philosophical milieus of modernity and postmodernity. For although within these epochs truth, science, metaphysics, and philosophy have been frequently deconstructed, the author came to note the pervasiveness of the human angst to understand being (Maslow, 1943:384, FitzGerald in Gilson, 1999:xi, Ashley, 2006:3).¹ This seeking of being always occurs within the subject's broader context, that is, within the cosmos, of which the subject is but one component; a fertile ground for wonder.²

To consider existence, the contemporarily perceived opposing paradigms of science and religion are oftentimes utilised by the thinking subject. However, both science and religion are frequently queried as effective paths to knowledge of being within both modernity and postmodernity.

In embarking upon this research project, the contention of the author is that a theoretical framework wherein multiple paths to truth as knowledge of being can be accessed, requires development. This will permit being to no longer be misconstrued in its deconstruction.

1.3. Problem statement:

The post-Humean and Kantian philosophical arena incorporates relativistic – and sometimes – subjectivist epistemology. This has its source in the *Ding an sich* (“thing-in-itself”) having become construed as evading the philosopher, such that realist theories that direct beyond sensory perception are oft considered as untenable. A direct consequence of the thinking subject's distance from the thing-as-it-is, is that metaphysics is considered to be a futile exercise, as upon this reading the investigation of being escapes the human. Without metaphysics, “hard” science is *the* authoritative interpreter

¹ “... [There is] a yearning for ‘wisdom’... [to] seek a unified worldview that can guide... individual and communal lives and give them meaning or purpose...” (Ashley, 2006:5).

² “... [W]onder is the feeling of a philosopher, and philosophy begins in wonder” (Plato, *Theaetetus*, 155d).

of the cosmos, as scientific scholars would have it believed. An important problem, however, is that at every moment of human existence – despite its neglect – being is encountered both within and without the thinking subject in the cosmos. By its being, being demands a non-reductive, nuanced consideration.

The articulated milieu of Continental postmodernity and modernity's positivistic, scientific and "New Atheistic" thinking – that inform some contemporary philosophical discourses and scientific research – lead to my identification of some important research questions:

- Is "hard" science the only route to knowledge?
- Are science and faith mutually exclusive?
- Are there points of interaction between science and faith?

1.4. Purpose statement:

Beholding the decline in the study of existence through the rejection of metaphysics – despite reality's assumed standing – this work has the purpose of attempting to re-place metaphysics to the core of the human understanding of the cosmos utilising the thought of Saint Thomas Aquinas.

1.5. Aim of the study:

This study aims at attempting to reclaim Saint Thomas Aquinas as a unifier of knowledge in the context of being's forgottenness, a setting wherein science and faith have come to be pitted against one another as opposing categories. In uniting reason and faith, physics and metaphysics, in the Thomistic concept of *scientia* – knowledge of the true – I posit that there is no struggle between faith and science, but only human understanding of a singular, complex, and multi-layered, ontologically objective reality.

1.6. Methodological approach:

To adequately respond to the identified research problem, bearing in mind the rationale for this study as well as the classified purpose and aim, I have elected to employ the dialectical method in the Aristotelian-Thomistic tradition. Accordingly, particular positions will be put forth and dialogical encounters made to develop nuanced solutions. To bring about this dialectic, and to remain as faithful as possible to Aquinas, a careful reading and use of primary texts will be done. Indeed, this textual analysis places the texts considered

in the context of contemporary themes. Thus, historical philosophical theories will be reconstituted within current presenting problems.

The methodology of reconsidering historical texts in philosophy emerges from an awareness of the success of both current and historical philosophy in responding to contemporary problems (Gracia, 1992:25). However, in returning to texts, it should be borne in mind that the historical philosophical text placed before the present-day philosopher is not created by the reader of the text. Rather, it is a reality given by the philosopher of the past (the author) to the philosopher of the present (the reader) (1992:26). To comprehend the text, the methodology of the primary author needs to be entered into by the reader, whether this be language, socio-cultural context, etc. (1992:26). Inasmuch, however, as the reader interprets the text in terms of her own worldview, the text cannot be interpreted haphazardly for its existence demands as close as possible interpretation as can be mustered (1992:26). Anyone engaging a text must return “... *to the same principles...*” as the author for this translation (Gilson, 1999:243).³ Of such importance is the text that we can assert unabashedly that herein lies philosophy (Gracia, 1992:27). Indeed, to ignore the historical philosophical text is tantamount to removing the relevance of the tradition of philosophy that informs the method because philosophical history holds the annals of ideas (Gracia, 1992:27, Gilson, 1999:xiv).⁴

Effective philosophy, I presuppose, emerges from a thorough grounding in philosophy’s history, so that any philosophical hypothesis has a point of origin (Gilson, 1999:xiii). But greater than a point of origin, the common philosophical method – present through philosophical history – forms a continuous whole in philosophy, though of course there are multifarious paradigms contained herein (1999:xiv).

³ Étienne Gilson, a Thomist historian of Philosophy, centred his historiographical methodology upon the philosophical text itself (Gracia, 2003:1). Clearly enamoured and influenced by the Gilsonian method, Gracia notes:

“For Gilson, the text is the beginning, middle and end of the history of philosophy... only through a text do we have access to the view of particular historical figures” (2003:1).

While the text is foundational Gilson also emphasised the context within which the text was written by the author, the readers to whom the text was directed, as well as the philosophical milieu out of which the text was the product (Gracia, 2003:2).

As an historian of Philosophy, Gracia commends Gilson for his research always remaining true to the primary text (2003:4).

⁴ “... [T]he experience of the history of philosophy is the starting point for philosophical reflection” (Maurer, 1990:26).

The history of Philosophical discourse demonstrates the importance of returning to primary texts in addressing particular problems. I will hence continue this tradition, in reclaiming the Thomist approach by carefully returning to the primary texts of Saint Thomas Aquinas and placing them in dialogical arrangement with identified current philosophical problems.

1.7. Thesis statement:

To address the primordial need to recapture being and knowledge of being, I conjecture that knowledge of reality should be identified – in accord with the Thomistic perspective – as “*truth*”. This, in my opinion, will facilitate exploration of the multiple, valid aspects of human understanding that comprise truth as reflections upon *reality-as-it-is*. With truth at the core of the discussion, Saint Thomas Aquinas’ work becomes relevant once more. For although truth has been deconstructed, it will be reclaimed as perceivable in all true things that have being. In particular, cosmology will be utilised to illustrate the unity of truth in being. This is a result of the consistent argument that will be offered: the causal nature of the cosmos demands more than an unsatisfactory absolutist, physical solution to the problem that all things that are, have being.

1.8. Schematic outline:

It is expedient to present a broad outline of the manner in which the argument to be developed – as articulated in the thesis statement – will progress, to aid the reader in perusing this work. It is here presented as a “schematic outline”.

Employing the historicist reconstructivist method, the author deems Thomism to be a useful historical philosophy to re-embrace in the midst of the current overlooking of metaphysics. To this end, the foundations for a correspondence theory of truth – based on the Thomistic definition of Truth as the conformity between being and intellect – will be employed (*Summa Theologica*, Book I, Question 16, Article 2). This will include an explication of faith and reason in the context of truth, as well as Saint Thomas’ understanding of perceived reality in scientific theory as a form of critical realism (Aquinas, 1999:11, 30).⁵

⁵ Aquinas’ theory of truth is an adaption of the correspondence theory of truth, as he left room for both objectivism and relativism in truth leading to his “critical realism” wherein truth is understood as both objective (the reality perceived in and of itself) and relative (to the perceiver, who participates in perceived truth’s construction) (Aquinas, *Summa Theologica*, I, Q. 16, A. 2).

Subsequently science and religion will be imaged as dimensions of the faith and reason discussion.⁶ Faith and reason concern all aspects of human experience, encompassing both physical and metaphysical dimensions of reality; distinct, yet unified. They make claims about the reality which is, although in different modes through different methodologies of inquiry and from different perspectives. In science leading to meta-questions, an attempt at answering these questions of causality and foundations has to be made.

In the Scholastic tradition, faith – as one form of metaphysical reasoning – needs consideration, for faith is always seeking understanding.⁷ Additionally, in this dynamic of reason leading to meta-questions being posed with rational faith lies a potential source of further development of scientific knowledge (“*scientia*”).⁸ The unity of the human exploration of reality itself (“*scientia*”) can be established pointing to the oneness of truth as reflective of *being*. I will argue that this is only achievable though, when science is exposed to its own existence, and the problem of being comes to the fore. “*Scientia*” is not limited to the physical and natural sciences, but brings to the fore the unity of science as knowledge of reality *as-it-is*, i.e. of truth, wherein there is no conflict between faith and reason. Aquinas’ embracement of faith and the intellect in *scientia* offers a challenge to many understandings of science returning to an original conception: a rational exploration of reality through seeking foundational principles leading one to truth, unhindered by the reductivism of positivist materialism which haunts science (1999:33). This realism assumes that the person has access to reality although the entirety of reality is not

⁶ In the Thomistic conception, “faith” concerns propositions with the object of belief in the First Truth (Aquinas, *Summa Theologica*, II-II, Q. 1, A. 2). However, cautions Aquinas, the First Truth, God, is not grasped in human understanding as God is, but only as a subjective conceptualisation of what is (II-II, Q. 1, A. 2). Whilst commonly construed as the opposing category to “faith”, the Thomistic notion of “reason” claims nothing more than understanding, that is, the attainment of true knowledge through the reasonable movement “... *from one thing understood to another*” (I, Q. 79, A. 8). Faith, through the employment of propositional reasoning proceeds in a reasonable manner toward the attainment of “*intelligible truth*” (I, Q. 79, A. 8). The two are thus not opposing forces!

⁷ “*To believe is nothing other than to think with assent... Believers are thinkers: in believing, they think and in thinking they believe... If faith does not think, it is nothing*” (Saint Augustine of Hippo, *On the Predestination of the Saints*, Book I).

⁸ In its simplest definition, “*scientia*” is delineated by Aquinas as total knowledge of a thing, that is, knowledge that incorporates both natural philosophical and metaphysical understanding:

“The perfect act of the intellect is complete knowledge, when the object is distinctly and determinately known; whereas the incomplete act is imperfect knowledge, when the object is known indistinctly, and as it were, confusedly” (I, Q. 85, A. 3).

graspable by the perceiver in that knowledge is received in accord with the perceiver's disposition.⁹

Reason alone reaches a juncture where it cannot explain being. When physical science meets boundary questions, i.e. questions at the explanatory limits – beyond its sphere of competency – alternate methods of investigation and explanations need to be sought. Faith is such a mode of reasoning. The boundaries demonstrate an instance of the manifestation of the intimacy between faith and reason. In the posing of metaphysical questions, when causality and foundations in scientific theory need probing scientific explanatory ability is transcended, for these are not scientific questions.

Exploring these “meta-questions”, the importance of metaphysics to the corpus of knowledge is emphasised. Within natural philosophy – the historical root of philosophy of science – meta-questions have always formed part of a continuum begun in the “hard” sciences (McMullin, 1981:182). Indeed, without this starting point knowledge of reality is ignored, so resulting in the postulation of a metaphysics entirely irrelevant to reality (McMullin, 1981:182). This was precisely Hawking's warning.

Boundary questions reasonably point to the problem of causality because being is and must be explained. This is not, however, the *god-of-the-gaps*. This “god” is dead. Because science has not found explanation for a particular aspect of science certainly does not mean that one may take the liberty of appealing to a reductionistic understanding of both creation and possible cause.

Both truth (in terms of scientific knowledge as conformity between being and intellect), and being (in light of metaphysical discussions) are at the fore of this discussion. Hence, Saint Thomas's question: “*Is true convertible with being?*” will be explored (*Summa Theologica*, Book I, Question 16, Article 3). Moreover, from the *Summa*, the nature of being can be investigated. From this the *unity of truth* will be proposed as referring to *being* itself.

The decline in metaphysics through the post-Kantian critique – despite being always being – has been our focus. From within a Thomistic framework, the suggestion is made that

⁹ “... [T]he fulfilment of any motion is found in the term of the motion; and, since the term of the motion of a cognitive power is the soul, the known must be in the knower after the manner of the knower... A thing is not called true, however, unless it conforms to an intellect. The true, therefore is found secondarily in things and primarily in intellect” (Aquinas, *Truth*, Q. 1, A. 2 [2008a:10-11]).

through the method of reconstructivist historiography the problems outlined may find potential solution which will be of relevance both to the poetic and critical traditions of philosophy. Thus, found in the past, philosophy's relevance to contemporary problems remains. The historiographical method will concern itself with reclaiming the Thomistic understanding of metaphysics and its consequent epistemology.

In reclaiming an awareness of being especially at the limits of science, philosophy can become more real, indeed, more in keeping with the continual findings of hard science which deal with real entities. These entities which have being, require their existence explained. The scientific method is alone not able to account for why anything has being. A more complete justification can be found, however, when metaphysics is brought into relation with physical existence, such that physics and metaphysics form a continuum of explanation of being.¹⁰ This will be our aim.

¹⁰The Ancient Greek etymology of the current English term "metaphysics" is: "τὰ μετὰ τὰ φυσικὰ βιβλία" ("*ta meta ta fusika*"), which means: "what comes after physics or the natural". Metaphysics is hence always conceived in relation to physics: it cannot be after what it does not know. From the earliest times, an epistemological progression was formed from physics into metaphysics.

Notes:

ⁱ Despite being called “New Atheists”, we wonder what the novel stance posited by Richard Dawkins, Christopher Hitchens, Sam Harris and Daniel Dennett is. Nevertheless, the “New Atheistic” absolutist stance of demonising faith and exulting scientific enquiry as the sole defensible methodology to be employed in knowledge acquisition is demonstrated below. These illustrate a lack in consideration of foundational metaphysical questions.

“I am against religion because it teaches us to be satisfied with not understanding the world” (Dawkins, n.d.).

“The conflict between religion and science is inherent... The success of science often comes at the expense of religious dogma; the maintenance of religious dogma always comes at the expense of science. It is time we conceded a basic fact of human discourse: either a person has good reasons for what he [sic] believes, or he does not... Every sane human being recognizes that to rely merely upon ‘faith’... would be both idiotic and grotesque... [On the other hand,] science... includes all reasonable claims to knowledge about ourselves and the world... Faith is nothing more than the license that religious people give one another... when reasons fail” (Harris, 2006).

“Religion comes from the period of human prehistory where nobody... had the smallest idea what was going on. It comes from the bawling and fearful infancy of our species, and is a babyish attempt to meet our inescapable demand for knowledge” (Hitchens, 2007:64).

“Religion has run out of justifications. Thanks to the telescope and the microscope, it no longer offers an explanation of anything important. Where once it used to be able, by its total command of a worldview, to prevent the emergence of rivals, it can now only impede and retard—or try to turn back—the measurable advances that we have made” (Hitchens, 2007:282).

“Faith is the great cop-out, the great excuse to evade the need to think and evaluate evidence. Faith is belief in spite of, even perhaps because of, the lack of evidence” (Dawkins, 1994).

CHAPTER 2:

Reclaiming the primacy of being in contemporary philosophy

“... [T]he word *being* is a noun... [which] signifies either a *being* (that is, the substance, nature, and essence of anything existent), or *being itself*, a property common to all that which can rightly be said to be... As a verb [‘to be’]... no longer signifies something that is, nor even existence in general, but rather the very act whereby any given reality actually is, or exists” (Gilson, 1952:2).

2.1. Introduction:

For realists, being (what is) should be conceptualised in all scientific endeavours. Currently there are influential scholars – including the “New Atheists” – among whom issues of faith and science, the relativity of truth, and the irrelevance of philosophy as a whole are propagated (Hawking & Mlodinow, 2010:5). From this populist perspective, the realist position may appear anathema. Nevertheless, many scientific advancements have been made by those who presupposed that their findings were not instrumental but representative of the way things are.¹ In these instances, the scientific findings tie intimately with being.

The “problem of being” has its roots in the earliest recorded Western intellectual thought. In its crudest definition, the vague term “being” can be articulated (Bunnin & Yu, 2004:76). But in this work, we will en flesh the definition somewhat, holding that it is:

“... [S]onic, single, permanent, unchanging, fundamental reality, to which is habitually opposed the inconstant flux and variety of visible things” (Dillon, 2000:51).

Accordingly, “Being” conceptually grasps the more general action of existence (“to be”), as opposed to the existence of any specific entity (Gilson, 1952:2).¹ Being is hence elevated beyond particulars to the universal, shared among all extant entities. This is the “real” that is the domain of metaphysical enquiry since at least the era of Parmenides of

¹ The quote cited at the beginning of this chapter demonstrates the Gilsonian position.

Elea (b. 515 BC) (Bunnin & Yu, 2004:76, Fairbanks, 1898:86).² Parmenides' reduction of reality to being was the fruit of the Ancient Greek attempt to find the "*arché*" (the origin, source, first cause, foundation, etc.) of what is (Gilson, 1952:6). Whilst we acknowledge the problem of being's roots in the history of philosophy, this work is not concerned with the Ancient Greek analysis of being, save from the historical recognition of the theme as considered by the two "pillar"-like figures of Western philosophy, Plato and Aristotle. Indeed, Plato clearly articulated the problem at hand:

"Does he who knows know something or know nothing? Do you reply in his behalf, 'I will reply,' *he said*, 'that he knows something,' 'Is it something that is or is not?' (Plato, *Republic*, Book 5, Section 476e).

Plato reemphasised Parmenides articulation of non-being's impossibility (*The Sophist*, 258e & 259a). However, whilst Plato conceived of universal forms as being, culminating in the single Form of the Good (*Republic*, Book 7, Sections 514a-521a), Aristotle introduced the problem of the one and the many in being (Bunnin & Yu, 2004:76).³ Through the later period of Greek philosophy and Scholasticism, either Platonic or Aristotelian lines of thought were maintained in both the Ancient and Mediaeval historical epochs.

However, the "Scientific Revolution" marked the end of the Middle Ages by a paradigmatic shift of the way in which the thinking subject related to being.⁴ ⁱⁱ The Scientific Revolution is a direct outgrowth of the Renaissance, from which also emerged the Age of the Enlightenment (Henry, 2002:9). The causes of the Renaissance were varied, but remained intimately tied up with the historical events of Europe at the time (2002:9-10). In what is today Italy, "humanist" scholars began to re-explore the primary texts of the Ancients (2002:10). So whilst Aristotelian philosophy had come to be exalted during the Middle Ages, the "humanist" scholars rediscovered the work of other philosophers (2002:11). Aristotle's pre-eminence was questioned and his natural philosophy was no longer considered as the sole source of "scientific" knowledge (2002:12). With this

² "It is necessary both to say and to think that being is; for it is possible that being is, and it is impossible that not-being is... That things which are not are, shall never prevail... Either being exists or it does not exist..." (Parmenides in Fairbanks, 1898:91, 95).

³ "... [T]here must be differentiae of each genus, and each differentiae must be one: but it is impossible either for the species of the genu to be predicated of the specific differentiae, or for the genus to be predicated without its species" (Aristotle, *Metaphysics*, Book 3, Section 998b).

⁴ The historian Herbert Butterfield argued that modernity was properly founded in the Scientific Revolution (Henry, 2002:9).

revolution new forms of knowledge and methodologies – through which knowledge could be founded and developed – emerged (2002:12).

In the Renaissance reforms and its intellectual proponents' altered attitudes towards authoritative sources, Western scientific thinking evolved in texts like the Polish priest-astronomer Copernicus' "*De revolutionibus orbium coelestium*" and along with these, the Scientific Revolution itself began (2002:13).⁵ Copernicus' cosmological model revolutionised physical science as a perceived realist representation of the observed heliocentric cosmological system (DeWitt, 2010:121). Where earlier cosmological models placed the earth – as the dwelling place of humanity imaged in the likeness of God – at the centre of the cosmological system, Copernicus "relocated" the sun to the central position of the universe (2010:121). Copernicanism was then widely taught as there had been little cosmological development from the second century AD Egyptian, Ptolemy's to Copernicus' findings (2010:132). The Copernican *realisation* that the universe was so much larger than just the solar system paralleled an expansion of the understanding of humanity and the place of the human in the cosmos. But, Copernicus' heliocentric cosmology was often understood instrumentally rather than realistically, as we noted with Osiander's Preface (De Witt, 2010:133, Stanford, 2006:400). Copernicanism was hence diluted into becoming a convenient way to explain observed phenomena while saving the scripturally sound anthropocentric cosmic worldview (2010:133).⁶ A distance was thus created between being (that which is) and scientific theories conceived as useful instruments, but not as reflective of being in any way.

I will argue that with and since the German philosopher Immanuel Kant (1724 - 1804) there is a moving away from a realist position in the turn to the subject (White, 2009:10).⁷ Enlivened by the Copernican revolutionary spirit, Kant sought to bring a similar metamorphosis of relocating the thinking subject to philosophical thought.⁸ Kant's

⁵ Copernicus, 1473-1543.

⁶ Instrumentalism does not posit the existence of "real" entities (Stanford, 2006:400).

⁷ Indeed, so strong is this redirection in philosophers like Wittgenstein and Rorty, that thought concepts and language games are totally unrelated to, and do not refer to, a "world" extra to the subject.

⁸ "*We here propose to do just what Copernicus did in attempting to explain the celestial movements. When he found that he could make no progress by assuming that all the heavenly bodies revolved round the spectator, he reversed the process, and tried the experiment of assuming that the spectator revolved, while the stars remained at rest*" (Kant, [1787]2010:13-14).

Copernican revolution concerned epistemology, particularly the manner in which objects are understood by perceiving subjects ([1787]2010:14).⁹

The essential – and seemingly impassable – problem posed by Kant is that while *a priori* knowledge is only possible if intuition conforms to the object in-itself, it is seemingly impossible to ensure that intuition does conform to the object itself. A particular conundrum is that, of necessity, the perception and cognition of the perceiver is “coloured” by experience. This leads to any constructed knowledge actually distanced from the *Ding an sich*.

“... [W]e find ourselves involved in a difficulty... [W]e cannot discover how the subjective conditions of thought can have objective validity, in other words, can become conditions of the possibility of all cognition of objects; for phenomena may certainly be given to us in intuition without any help from the functions of understanding... [But] phenomena might be so constituted as not to correspond to the conditions of the unity of thought; and all things might lie in such confusion... [such] that this conception would be quite void, null, and without significance” ([1787]2010:91).

Epistemologically, Kant had disassociated the object in-itself and the appearance of the object to the thinking subject (Strauss, 2009:122). While it was still possible for the subject to conceptualise the *Ding an sich*, it was no longer possible for the perceiver to *have knowledge* of the object in itself (2009:122). Hence, knowledge is only the appearance of things, but never of the things themselves. Herein lies the Kantian moment of Enlightenment, whereby a radical change in thinking influenced by the questioning values of the Renaissance in the Scientific Revolution and the Enlightenment came about ([1784]1949:132).¹⁰ The Enlightenment is not merely an historically identifiable period in world history, but a temperament embodied by the “enlightenment” person. The Enlightenment so conceived is the freedom given by maturation to think for oneself, without reliance upon the authority of another (in the form of culture, faith, or dogmatic system) ([1784]1949:134). Indeed, it is this freedom that undergirds the Enlightenment mode of being: the turn to the subject and with it a partial turn from the object.¹¹ In the turn

⁹ “We may make the same [Copernican] experiment with regard to the intuition of objects. If the intuition must conform to the nature of the objects, I do not see how we can know anything of them a priori. If, on the other hand, the object conforms to the nature of our faculty of intuition, I can then easily conceive the possibility of such a priori knowledge” (Kant, [1787]2010:14).

¹⁰ “Enlightenment is man’s [sic] leaving his [sic] self-caused immaturity. Immaturity is the incapacity to use one’s intelligence without the guidance of another” (Kant, [1784]1949:132).

¹¹ “Human reason no longer accepts, but rather logically controls nature as an object in service of the human spirit with its self-determination and self-understanding as pure subject, directed at the own experience of its power and freedom” (Strauss, 2009:121).

to the subject, being is forced into the background as the perceiving subject comes to the fore. The fruit of the Enlightenment is a turning away from being, for the self is the understanding absolutised. But, the perceiving subject's limitations constrain what can be known.

In understanding, Kant argued for a conception of an object to be had, an intuition must occur, which is the product of the object having been "... *given to us*" ([1787]2010:43).¹² These are given to the perceiver only through representations of those objects which come to the perceiver through "sensibility" ([1787]2010:43).¹³ There is, in this process of understanding an ever-growing distance between subject and object. What is thought of by the mind of the perceiver is not the object itself but representations of the object generated through intuition and the senses.¹⁴ However, Kant had earlier declared the impossibility of knowledge of real things being conceived *sensibly* (Langton, 2004:133).¹⁵

I argue that the presupposition of the objective reality of the perceived phenomenon requires deconstruction. In Kantian epistemology, all that can be known is received through the senses, from which intuition and then representation arise. It is hence not knowledge generated by a collective body of perceivers, but rather the product of subjective knowledge generation through the senses, which in effect cannot have knowledge of the *Ding an sich* through the senses! (Langton, 2004:133) Knowledge for the Kantian sceptic is bounded by the ability of the subject (2004:134).

The limits imposed by Kant's subjective epistemology of the experience-able contributed significantly to the drawing of philosophical boundaries as opposed to the boundaries of the logically possible (Rorty, 1993:340). Rorty adds that the Kantian subject encapsulated all that could be known by philosophy, physical and natural science, and history (1993:340). However, as the other sciences came to better understand themselves and their objects of study in the process of naturalising "... *the notions of 'mind,'*

¹² Note the focus upon epistemology over ontology.

¹³ "*By means of sensibility, therefore, objects are given to us, and it alone furnishes us with intuitions; by the understanding they are thought, and from it arise conceptions*" (Kant, [1787]2010:43).

¹⁴ Representations and conceptions of objects cannot be received by the perceiver except through the senses (Kant, [1787]2010:43).

¹⁵ "*Such properties as belong to objects as things in themselves never can be presented to us through the medium of the senses... [and, moreover] we make the presupposition that the phenomenon, in which such and such predicates inhere, has objective reality, while in this case we can only find such an objective reality as is itself empirical, that is, regards the object as mere phenomenon*" (Kant, [1787]2010:52-53).

'consciousness,' and 'experience'..." in advances in evolutionary theory and psychology, the Kantian subject's domain was encroached upon (1993:340).¹⁶ ¹⁷ As the turn to the subject had overarched what was previously knowable, it was argued that a new overarching entity was required (1993:340).ⁱⁱⁱ Thus, language became the entity toward which – especially Analytic – twentieth century philosophers would turn (1993:340).^{iv} The turn to language originated in the Kantian scepticism towards unknowable objects, for as Wittgenstein argues in the *Tractatus*:

"Objects form the substance of the world... If the world had no substance, then whether a position had sense would depend on whether another proposition was true. It would then be impossible to form a picture of the world (true or false)" (1922:27).¹⁸

From this it follows that if the human does not have access to the objects of "the world" – which are attempted to be formed in human cognitive representations – any statement is only true in so far as it conforms to another linguistic statement. Whether a statement is true or false – in terms of its conformity to "the world" – is irrelevant. According to Thomas Nagel, when conceptions are made these are always in terms of language as a milieu out of which the person can never move (Nagel in Rorty, 1993:345). The later Wittgenstein even went as far as denying that language referred or directed to anything outside of a language game (Rorty, 1993:350).

"... [I]n the end when one is doing philosophy one gets to the point where one would like just to emit an inarticulate sound. – But such a sound is an expression only if it occurs in a particular language-game..." (Wittgenstein, 1986:93).

For Wittgenstein there is no escaping the many multiple and varied language games which people play. Outside these, our utterances are meaningless. The subject is inexorably bound within language in terms of what can be known and meaningfully conveyed. Whether there is any object beyond the language game becomes irrelevant since the subject has no access to that object.

¹⁶ "Naturalism" is a philosophical position which proposes that all explanations are causal, i.e. that there can be nothing which is uncaused (Rorty, 1993:342-343).

¹⁷ Earlier discussions of Kant's *Critique* emphasised his employment of the processes of perceiving and understanding (developing conceptions) through sensibility which directly relate to the processes unearthed in evolutionary theory and psychology of the nineteenth century.

¹⁸ In reading this excerpt from the *Tractatus* "no substance" is understood as "unknowable substance".

Developing the later Wittgenstein and Donald Davidson, Rorty advocates removing “... *the central presupposition of [realist] Philosophy...*”, namely, that sentences are true when they correspond with the way things are (1982:xviii).

“... [T]here is no sense in which any of these descriptions is an accurate representation of the way the world is in itself” (Rorty, 1989:4).

Rorty had taken both Kant and Wittgenstein to the extreme.¹⁹ Any representation does not accurately represent the world-as-it-is to the subject (1989:4). Instead, meaning is localised in linguistic convention, i.e. in the particular language game employed (1989:4). Thus, Rorty can disambiguously declare that there is no truth outside language:

“... [W]here there are no sentences there is no truth... sentences are elements of human languages, and that human languages are human creations...” (1989:5).

Only the players of language games possess meaning within their played games (1989:18). Meanings thus function within closed systems whereby consensus among players determines meaning rather than correspondence to “the world”. But, if meaning is only contained within sentences – as determined by language usage – then language games are closed referential systems.

In rejecting Modernity’s “grand narratives”, the Postmoderns also embrace language games and the incommensurable rules that control each game (Hamilton Grant, 2001:75). Each language game is a credible “form of life”, where, for instance, the language game of science has as much credibility as that of wizardry (Hamilton Grant, 2001:75). Indeed, Postmodern Continental philosophical thought is heavily laden with language game-type arguments. Heidegger, for instance, in his consideration of Stefan George’s poem, *The Word*, gives considerable attention to just such an approach.²⁰

“No thing is where the word breaks off.’ *Where something breaks off, a breach, a diminution has occurred... The word alone gives being to the thing*”.²¹

¹⁹ “... [A]word hasn’t got a meaning given to it as it were by a power independent of us. A word has a meaning someone has given to it” (Wittgenstein, 1960:28).

²⁰ Heidegger, 1971.

²¹ Heidegger, 1971.

Since Heidegger argues that “[l]anguage is the house of Being”, Being can only ever be out of the human experience, a part of which is language.²² In post-Kantian thought, the *Ding an sich* is decimated. All that remains is the humanly construed appearance, always conceptualised in linguistic terms – of “the word” – that ascribes being.²³ Without “the word”, the perceiver cannot identify anything as “thing”.²⁴ Indeed, without “the word” there is nothing at all.²⁵

“... [B]eyond signs independent of speakers, beyond text narrative, or discourse, there is nothing...” (Hamilton Grant, 2001:65).

Thus, I argue that we end in subjectivism. All understanding is limited by both the knowing subject and the linguistic system employed to partially comprehend “the world” which the subject has no access to, “as-it-is”. An uncoupling has occurred in the development of twentieth century philosophical thought. The ontological and epistemological aspects of truth have been divorced from one another. Meaning is transmitted only within closed language games. These do not have access to or reference to “the world” beyond the game played. Hence, realism has receded. But, not only does Being cry out for recognition for what it is, a hunger is apparent in humanity for a close tie to being, to know things as they are.²⁶

Any attempt at reclaiming realism in contemporary philosophical thought, however, needs to pay considerable attention to that problematised by Kant: the problem of the subject accessing objects. This is especially so because the foundational position of realists is that the human-world relationship is one among a myriad of relations *between objects* (Harman, 2011:55). But, for Kant, it is the perceiving subject which has privilege over all other relations, not objects (Harman, 2011:55). Kant’s influence upon philosophy is extensive, to the degree – Harman argues – that the subject’s privilege is seldom questioned (2011:55). To retrieve realism for the credibility of science – as having access to the *Ding an sich* – we are compelled to tackle Kant.

²² Heidegger, 1971.

²³ Heidegger, 1971.

²⁴ Heidegger, 1971.

²⁵ Heidegger, 1971.

²⁶ “All men [sic] by nature desire to know. An indication of this is the delight we take in our senses... [because] the senses, makes us know and brings to light... things” (Aristotle, *Metaphysics*, I, 1, §1).

2.2. Kant and metaphysical speculation:

Immanuel Kant saw it as his task to prevent the disfigurement of the sciences by clearly demarcating the limits between them ([1787]2010:10). In the B Preface of *The Critique of Pure Reason*, clear criteria for the defining of “rational science” are given ([1787]2010:11). Within these “objective sciences”, Kant found “... *real, substantive knowledge*” ([1787]2010:11). The sciences, understood in this sense, have the primary characteristic of the containment of “... *a priori cognition*...” which is tied to the object of the particular science’s attention ([1787]2010:11). Thus, the sciences are objective because they contain knowledge of the object of investigation *a priori* ([1787]2010:11). Such *a priori* knowledge should always be identified from knowledge supplied *a posteriori* ([1787]2010:11). It can be argued thus, that in order for knowledge to be scientific – objective (as in knowledge of the object) – science has to be in relationship without experience with the *Ding an sich* ([1787]2010:11).

However, Kant explains, following certain great scientific discoveries (among them those of Galileo, Torricelli, etc.), natural philosophers began to realise that reason does not necessarily conform to nature ([1787]2010:12). Rather it “... *perceives that which it produces after its own design*...” ([1787]2010:12). The natural world perceived by the scientist-subject must conform to the subject ([1787]2010:12). While prior to Kant, objective science’s object had to precede the scientist-subject, for Kant the object and the subject (including its categories of understanding) engage in a dialogical relationship to enable science.

Among what had been historically claimed as scientific, Kant encountered metaphysics. But he declared, metaphysics had not “... *the good fortune to attain to the sure scientific method*” ([1787]2010:13). If the *a priori* route to certain, objective, scientific knowledge is the determinant of scientific knowledge, metaphysics does not fit as there is such diversity in terms of metaphysical stances ([1787]2010:13). Now the content of the “science” of metaphysics is reality itself. Hence, if metaphysics is a science then *a priori* knowledge of reality should be accessible to the subject (Buroker, 2006:18). Objective knowledge should be possible.

“Let us then make the experiment whether we may not be more successful in metaphysics, if we assume that the objects must conform to our cognition” (Kant, [1787]2010:13).

While it is oft assumed that there is a connection between the thought of a subject and the phenomenon perceived, i.e. conformity between subject and object, Kant proposes that “... *all attempts to ascertain anything about these objects a priori... have been rendered abortive...*” ([1787]2010:13). To perceive, the subject should be in possession of a *a priori* knowledge of a particular object. But how does one come to have knowledge of a particular object without experience of that object? ([1787]2010:13) Alternatively, a *a priori* knowledge would be possible if the objects themselves conform to subjective intuition which is in place prior to any experience ([1787]2010:14). The latter position is a diversion from realism in its inversion of the object-subject relationship, whereby objects conform to the subject rather than subjects conforming to objects. Were subjects to conform to objects, however, it would be impossible to establish any *a priori* knowledge due to knowledge as the result of conformity to an object obtained via sensory information *a posteriori* (Buroker, 2006:20). If no knowledge without experience is possible, a *a priori* knowledge by objective science is impossible, too.

“... [W]e come to the conclusion that our faculty of cognition is unable to transcend the limits of possible experience; and yet this is precisely the most essential object of this science [i.e. metaphysics]” (Kant, [1787]2010:15).

Kant has paved the way to a devastating conclusion: all that is knowable are phenomena as perceived by the subject, not “... *things in themselves, [for] while possessing a real existence, [objects] lie beyond its sphere*” ([1787]2010:15). Though it is possible to know something, the knowledge of an object that can be known is not the *Ding an sich*, but only ever a representation of the thing – an appearance – as received and filtered, by the subject’s sensory organs. The clarification that dimensions of being – metaphysics’ subject – in themselves are not conditioned by the subject, they remain, should be made and recalled ([1787]2010:15). Hence, Kant could infer:

“... [T]he unconditioned does not lie in things as we know them, or as they are given to us, but in things as they are in themselves...” ([1787]2010:15).

The subject cannot reach objects or represent them in themselves. Indeed, all knowledge is appearance (Buroker, 2006:21). One can only be aware, according to Kant, of the representations possessed of appearances external to self ([1787]2010:23). As representations of appearances exist as transcendental categories, certainty that these exist external to the subject – as representations of objects – cannot be had

([1787]2010:23-34). Ultimately, all that can be cognated are the subject's representations, whether fictive or corresponding to an object external to the subject ([1787]2010:24).²⁷

“... [I]n cognition a priori, nothing must be attributed to the objects but what the thinking subject derives from itself...” ([1787]2010:16).

A respite is offered, however. While knowledge of a *Ding an sich* cannot be had, it is possible still to think of objects ([1787]2010:18).²⁸ Kant thus has introduced the separation between objects as experienced phenomena and objects as thought-objects independent of the subject ([1787]2010:18).

Metaphysics, therefore, becomes a science that cannot adequately access its object of study because the thinking subject cannot extend into the object of metaphysics.²⁹ Within Kantian metaphysics, hence, “... *objects disappear...*” from the possibility of knowing them outside human categories of understanding; independent from the subject's construed appearances, nothing is known of the *Ding an sich* (Harman, 2011:71; Langton, 2004:134).³⁰

Whilst the thinking subject is elevated in *The Critique*, the Kantian subjective turn has its flaws (Desmond, 2005:223). Among these is “... *the desolation of nihilism, anticipated, wrongly as the promise of a truer freedom*” (2005:223). Such “freedom” is rather imprisonment within constructed appearances for the subject left alone without being. Desmond analogously explains the nonsensical nature of *The Critique's* method:

“I need legs to walk from A to B. This is a given presupposition; but if I critique this presupposition, has the fact that I need legs to walk somehow been elevated to a higher presuppositionless level? I negate my given legs, but then I negate the negation and presto I have presuppositionless

²⁷ This is Kant's “*Unknowability Thesis*”: phenomena are distinct from the thinking subject's representative appearances, such that objects cannot be known as-they-are, whereas only appearances can (Buroker, 2006:21).

²⁸ “... [O]therwise we should require to affirm the existence of an appearance, without something that appears – which would be absurd” (Kant, [1787]2010:18).

²⁹ It is not possible to obtain a priori knowledge of reality ([1787]2010:22).

³⁰ The severity of Kant's *Unknowability Thesis* has been queried. Langton, for instance, has argued that the Kantian Critique emphasised that knowledge has limits rather than that all knowledge is totally dependent upon the mind for its generation (2004:129). While this may be Langton's reading of Kant, Kant himself refers to the human belief that there are objects external to the thinking subject as “... a scandal” ([1787]2010:23). Moreover, in the B Preface of *The Critique of Pure Reason*, we read:

“... [R]eason only perceives that which it produces after its own design...” (Kant, [1787]2010:12).

legs. They are now legs that can account for themselves, self-responsible legs that did not take for granted their ability to walk. Now I have an enlightened permission, a legitimate right to walk with them” (2005:226).

Similarly, the being of any object external to the thinking subject can be subjected to critique. From the subject’s position, this object’s existence can be denied, as can the possibility that any knowledge of the object apart from representations in the thinking subject can be had. Be that as it may, such critique does not remove the object, apart from *in* the consciousness of the subject. In emphasising the object’s being through critique, metaphysics hence becomes more apparent. That the thinking subject exists – evidenced by the subject’s critique – returns metaphysics to the centre, such that metaphysics can never be avoided or surpassed (2005:221).³¹ Being continues to be, despite that *The Critique* has influenced an inverted Copernican Revolution, for knowledge of the thing in itself could never be obtained.³²

The Kantian speculative perspective of metaphysics in the subject’s limit to appearances, should not, however, be interpreted as an anti-metaphysical stance. Kant’s implication in arguing that by “pure” reason alone access to the object is denied does not deny the being of the object ([1787]2010:446). Indeed, for Kant, whilst knowing is constrained, being is not, as demonstrated in his attempts to “save” the object through the utilisation of “practical” as opposed to “pure” reason ([1787]2010:446).³³ Kant states very clearly:

“... [T]here must be some source of positive cognitions... [that] account for the inextinguishable desire in the human mind to find a firm footing in some region beyond the limits of the world of experience...” ([1787]2010:446).³⁴

³¹ “... [I]f we think of metaphysics as asking for fundamental reflection, more or less systematic, on the basic senses of the ‘to be,’ or of what it means to be, metaphysics will never be a practice that we can put behind us. It will always be with us and before us” (Desmond, 2005:221).

³² Whereas Copernicus had “enlarged” the realm of the human by removing humanity from the cosmic centre, the Kantian “Copernican Revolution” influenced humanity’s greater centralisation at the ontological and epistemological centre severed from the “*Ding an sich*”:

“It is a humiliating consideration for human reason that it is incompetent to discover the truth by means of pure speculation...” (Kant, [1787]2010:446).

³³ In a personal email communication on 1st July 2013, A.J. Antonites comments:

“Metaphysics for Kant is an unavoidable pondering about humankind’s position within reality and the meaning of human kind’s existence” (the emphasis is my own insertion).

³⁴ That is beyond sensory experience and the resultant cognitive constructions of appearances.

As “pure” reason did not provide a foundation for the existence of objects, he takes an alternative route: “*practical reason*”, which refers to the natural world ([1787]2010:446-447). The broader milieu within which the human finds himself, Kant proposes, cannot be ignored – indeed, it cannot be left causally unaccounted for even if it cannot be established by “pure” reason ([1787]2010:448). Apart from the causality of nature remaining unestablished by “pure” reason, it also fails to demonstrate the experienced unity of nature because it cannot access nature as extra-subjective, mind-independent objects ([1787]2010:452). Thus far in the Kantian line, however, we have not been able to establish that anything beyond the thinking subject’s cognitive constructions in appearances exist. But, Kant explains, it is reasonable to assert the being of the natural world even if this is not provable by principles of “pure” reason:

“... [W]e are necessitated by reason to conceive ourselves as belonging to such a world, while the senses present to us nothing but a world of phenomena, we must assume the former as a consequence of our conduct in the world of sense (since the world of sense gives us no hint of it)...” ([1787]2010:453).

The Kantian claim to realism – as an ontological assertion – is a metaphysical “leap of faith”! The being of objects is practically asserted because the human experience makes it reasonable to hold it as such. Indeed, so convinced was Kant that he argued that when an object is held only theoretically as a representation to the thinking subject, if “... we *have sufficient grounds...*” to deem its objective existence one should believe it to be so:

“I should not hesitate to stake my all on the truth of the proposition—if there were any possibility of bringing it to the test of experience...” ([1787]2010:460-461).³⁵

Hence, the necessity of metaphysics for Kant emerges from the inability of pure reason to grasp beyond the thinking subject to the being of the object, which is neither sensorily nor empirically verifiable, but reasonable nevertheless ([1787]2010:462).

The Kantian revolution indicated a turning point from realist philosophy in its classical sense, and this is his fundamental importance to this particular study. The “world” could no longer be imaged as absolutely mind-independent, received sensorily and cognitively constructed through the passive receptors of the human mind. Kant had given the thinking

³⁵ It is intriguingly ahead of his time that Kant uses the example of the possibility of extra-terrestrials living on other planets as an example to demonstrate the point that, if reasonable, a positive assertion of existence extra to the thinking subject’s knowledge of appearance, should be made ([1787]2010:461).

subject more authority in the process of knowledge production, instead of a naive reliance upon the object. However, his own turn to “practical reason” demonstrates that the object has not lost importance. It is still engaged in the epistemic task. In Kant, it is the equal inter-subjectivity between object and subject – as opposed to the prior absolute reliance upon the object – that ultimately made his thinking so revolutionary in the history of philosophy.

2.3. Nietzsche and truth:

Kant’s subjective turn was to take on a more radical position in later Continental philosophy. Friedrich Nietzsche, for example, continued the Kantian break-away from a mind-independent realism (2005:16).³⁶ Due to this as well as his influence on the development of Continental philosophy, I have chosen to utilise him to further explore the “turn to the subject”.

Nietzsche addressed the problem of the use of language as not conforming to or representing being at all. He argued that truth is the product of a process of construction and conformity of meaning among people (2005:15). The thrust behind *On Truth and Lies in a Nonmoral Sense* is Nietzsche’s question: where does the human drive towards truth emanate from? (2005:15)

If a claim to truth is in fact made and articulated linguistically, Nietzsche ponders whether that truth-claim expressed in a word transcends itself and relates to the entity to which it points (2005:16). Using the reality of multiple extant languages having diverse terms pointing to the same objects, Nietzsche proposes that no word necessarily relates to any object (2005:16). If no word is tied in its relation to any object, truth regarding the object as expressed linguistically is unimportant.³⁷

“The ‘thing in itself’... is likewise something quite incomprehensible to the creator of language and something not in the least worth striving for”
(2005:16).

What is “known” when utterances referring to particular objects are made? Nietzsche argues that all that is known are metaphors (2005:16). When referring to a particular

³⁶ Nietzsche, 1844-1900.

³⁷ The relationship between word and object is merely the arbitrary conformity of speakers (Nietzsche, 2005:16).

“book”, for instance, the inferred can only be that which is conceived “like a book”, not the “book as-it-is” (i.e. *Ding an sich*). But the referring metaphor does not emerge from nowhere. Indeed, the Nietzschean account is that linguistic metaphors arise from the perceptual process, wherein humans categorise naturally existing perceived objects rather than as associated species of objects (2005:17).³⁸ Truth as such cannot be obtained as knowledge of any particular object as-it-s. “Truth” is hence defined as:

“A movable host of metaphors, metonymies, and anthropomorphisms: in short, a sum of human relations which have been poetically and rhetorically intensified, transferred, and embellished, and which, after long usage, seem to a people to be fixed, canonical, and binding. Truths are illusions which we have forgotten are illusions; they are metaphors that have become worn out and have been drained of sensuous force...” (2005:17).

Whenever a metaphor (linguistic entity) is created which “refers” to an object, Nietzsche is of the view that this metaphor – as a projection of a category or label of the thinking subject upon an object – is “anthropomorphic”, as the subject determines it (2005:18-19). All that is true in the metaphor is true only for the subject and for those who “subscribe” to that particular shared meaning (2005:19). The truth of any linguistic entity as created is therefore relative only to the subject, whereby the subject becomes the determiner of truth, the creator of his/her true reality rather than truth as ontologically localised in the object itself. Nietzsche admonishes, though, that the knower should realise that the known is metaphorically created, and is not the object as-it-is (2005:19).³⁹ Hence, for truth’s apprehension, the transcendence of metaphoric creations is required (2005:19).⁴⁰ But this is impossible. The subject can never express the object adequately from its own perspective: the fundamental distinction between subject and object always remains (2005:19). As the thinking subject perceives, metaphors are generated by the subject from within the categorisations and conceptions (or forms) that exist within the subject

³⁸ When considered from the perspective of physical and natural science, Nietzsche’s position seems somewhat unwarrantable. That in biological terms species, phyla, genuses, etc., exist and that particular species breed with their fellow species’ members, or that chemical elements are as individuated entities would indicate that contrary to Nietzsche statement: “... *nature is acquainted with no forms and no concepts, and likewise with no species...*”, species do in fact exist (2005:17). It can readily be ventured that concepts are the imposition of the thinking subject, but that ontological similarities in terms of groupings should be acknowledged.

³⁹ “... [I]t seems to me that ‘the correct perception’ – which would mean ‘the adequate expression’ is a contradictory impossibility” (Nietzsche, 2005:19).

⁴⁰ “... [O]nly by forgetting that he himself is an artistically creating subject, does man live with any repose, security and consistency...” (Nietzsche, 2005:19).

(2005:20). All that is hence understood is always in terms of what pre-exists (2005:20).⁴¹ It is not truth as objective in relating to the object beheld.

If “truth” does not correspond to any object but to the metaphor created by the subject, Nietzsche is justified to ask why truth is preferred or valued over the false? (2005:24). Were truth as object-as-it-is not graspable by the subject it should be admitted that for the thinking subject, “the world” as-it-is *is* alien to the one who imposes itself upon that reality, upon being. Nietzsche categorically states:

“We have abolished the real world...” (2005:25).

In abolishing the “real world”, Nietzsche continues the severing of subject and object, enabling ever-more anti-realist philosophy (2005:25). The radicality of Nietzsche’s claim is akin to that of Rorty: outside subjectively constructed language there is nothing (1989:4-5).

Despite the purported “eradication” of reality and objective truth, however, being continues to “cry out” to the subject. Being demands acknowledgement even in the existence of the Nietzschean metaphor-generating subject or the Rortian linguistic system. Moreover, while being may be inaccessible to the subject, the being of the object cannot be removed by any subject. Still, being in subject and object, is placed aside in this account.

2.4. Heidegger and metaphysics:

Although directed at the Greeks, Martin Heidegger lamented:

“... [A] dogma has been developed which not only declares the question about the meaning of Being to be superfluous, but sanctions its complete neglect...” (1962:21).⁴²

In light of the Modern and current forgetfulness of Being (*Sein*), the Heideggerian position could be applied to the contemporary philosophical milieu. Still, the fundamental metaphysical question of why anything is, is *the* primordial philosophical question: as

⁴¹ “*The drive toward the formation of metaphors is the fundamental human drive, which one cannot for a single instance dispense with in thought, for one would thereby dispense with man [sic] himself*” (Nietzsche, 2005:21).

⁴² Heidegger, 1889-1976.

being in Being, the thinking subject can never move outside metaphysical considerations in philosophy, for (Heidegger, 2000:1-2):

“Metaphysics stands as the name for the center and core that determines all philosophy” (2000:19).⁴³

Indeed, when the question of why anything exists arises, metaphysics must come to the fore: more than why any particular thing exists, why is anything? (2000:35) Why is Being? (2000:35) And what is the relationship of Being to beings? (2000:35)

From the Heideggerian perspective, the sought Being cannot be localised in any particular instance of being: “... we do not find this Being within the being” (2000:36).⁴⁴ Then the metaphysician may ask in frustration: “Where is Being situated? Is it located anywhere at all?” (2000:37)

It is not possible to discover Being. Heidegger develops a metaphor: nothing is that which simply cannot be known as there is nothing more to ask or to know about it, and this, too, is the case with Being (2000:38, 25).⁴⁵ Following Nietzsche, Heidegger proposes that if Being is unknowable in its hiddenness – as the theoretical cannot construct metaphysics – philosophers should abandon the metaphysical task totally (2000:39).⁴⁶ The question of why anything is should be abandoned! (2000:39). The Heideggerian conclusion is surprising given his earlier anxiety over the forgottenness of metaphysics (Heidegger, 1962:21).

“Being is in fact almost nothing more than a word now, and its meaning is an evanescent vapor” (2000:53).

Being is construed as meaningless because it has not been well thought through (2000:53). That Being cannot be reasonably construed, however, does not mean that it

⁴³ For Heidegger, the focus of metaphysics is the broad concept of Being rather than the particular being of an object and the content which accompanies that object’s being (2000:4). In metaphysics one thus considers the Being of particular beings themselves (2000:34). Hence, a level of abstraction – unknown from the particular content of beings – is maintained (2000:20).

⁴⁴ The thinking subject does not perceive Being in any particular object (Heidegger, 2000:36). That different thinking subjects each perceive particular objects differently seems to support Heidegger (2000:36). From a clarified realist perspective, however, the existence of the thing still remains.

⁴⁵ “Nothing is simply nothing. Questioning has nothing more to seek here. Above all, by bringing up Nothing we do not gain the slightest thing for the knowledge of beings” (Heidegger, 2000:25).

⁴⁶ In this sense, Heidegger severely challenges the Thomistic centrality of metaphysics (White, 2009:21).

has no existence. Rather it implies that because metaphysics cannot grasp Being, metaphysics must be overcome to rescue Being!

In Heidegger there is the curious combination of an unknowable ontology. While Being is, it is not knowable. It is like nothing, for about nothing, nothing can be known. Thus metaphysics, the discipline concerned with unknowable primordial principles, needs to be overcome.⁴⁷ This endeavour sought to counter Husserl's solution to the Kantian *Critique* (Stone, 2006:220).⁴⁸ While Heidegger tried to overcome metaphysics he also considered metaphysics as of relevance (Stone, 2006:222).

"Our thinking apparently remains on the path of metaphysics. Nevertheless, in its decisive steps, which lead from truth as correctness to ek-sistent freedom, and from the latter to truth as concealing and as errancy, it accomplishes a change in the questioning that belongs to the overcoming of metaphysics" (Heidegger, 2005:257).

If reality itself is the subject proper of metaphysics, and it appears obvious that metaphysics needs to have knowledge of the Being of all particular objects, metaphysics must have knowledge of all things in general (Stone, 2006:223-224).

The unknowable Being – the "nothingness" – is though, the source of the existence of the object (2006:225). For any entity to be particular it must share in Being rather than not be at all, even if the Being within which it has its particular being is the unknowable "nothingness" (2006:225). The emphasis is upon metaphysics rather than epistemology: for that nothingness is unknowable does not impede that anything is.

To know the being of an entity, however, requires the subject to make a comportment, that is, to be in a relationship of openness with Being (Heidegger, 2005:247). For Heidegger, truth is not to be found in any statement about the being of a thing but in the being itself (2005:247).⁴⁹ Openness to Being, though, finds its source in freedom, necessarily the disposition of the perceiving subject in relationship with Being (2005:248).⁵⁰ However, I maintain that Heidegger's exposition can be questioned. How is

⁴⁷ *"In Heidegger's philosophy, then, we [have]... a fairly realist philosophy in which the real ("[B]eing") exists, but is inaccessible to anything like a correspondence model of truth"* (Harman, 2011:54).

⁴⁸ Husserl employed phenomenological reductionism, such that God was replaced by the ego of the subject in metaphysics (Stone, 2006:221).

⁴⁹ *"... [To] know means to be able to stand in the truth. Truth is the openness of beings. To know is accordingly to be able to stand in the openness of beings, to stand up to it"* (Heidegger, 2000:23).

⁵⁰ *"The essence of truth is freedom"* (Heidegger, 2005:248).

truth located in the subjective disposition of freedom, if truth's presence was discerned in Being? This is particularly so since truth as freedom returned to the subject, would be open to the errors of the subject's reasoning. Heidegger responds:

"Even if an objectivity is also accessible to this subject, still such objectivity remains along with subjectivity something human and at man's [sic] disposal" (2005:248).

As a direct critique, Heidegger may be handed back the problem of the perceiving subject's objectivity. Perhaps, though, he is reiterating the Thomist understanding of Truth as comprising both subjective and objective dimensions in its conformity between intellect and Being that he earlier considered (2005:245).⁵¹ There appears to be both ontological/metaphysical and epistemological dimensions at play here. Nevertheless, Heidegger's emphasis upon the subject's freedom alters the "traditional" conception of metaphysics as pertaining to the absolutely objective (2005:248). In this position – where freedom in the sense of the subject's openness to Being determines truth – metaphysics is the project of the subject (2005:248). While truth has been conceived as freedom, Heidegger begs the question:

"... [F]reedom is the ground of the inner possibility of correctness only because it receives its own essence from the more original essence of uniquely essential truth" (2005:249).

It is, Heidegger argues, in freedom that being is enabled to be what it is (2005:249). If freedom is the product of the perceiving subject, however, wherein there is an encounter between the subject and object, the likelihood of the object evading constraint by the subject seems minimal. Hence, is freedom essentially what is true? The converse could also be asked: is truth that which is free?

"Freedom, understood as letting beings be, is the fulfillment and consummation of the essence of truth in the sense of disclosure of beings... through which an openness essentially unfolds..." (2005:250).

"Letting beings be" implies distance between the subject and the object. This freedom requires a pre-acknowledgement of Being before perception and cognition, such that the object is not limited by categories of understanding imposed by the thinking subject, the agent which acts out of freedom. Therefore, metaphysics – from the Heideggerian perspective – despite the demand that it be overcome, nevertheless precedes the

⁵¹ Aquinas, *Summa Theologica*, I, Q. 16, §2.

subject's epistemological endeavours. Despite this, Heidegger's task is a reconstruction rather than a removal of metaphysics. In placing Being at the heart of metaphysics as opposed to leaving it as a vague universal conception without content – through freedom – Being is allowed to be (2005:256). Still, following earlier argumentation, Being refers to no-thing. Nevertheless, it is the perceiving subject which queries why particular objects have being. If metaphysics is overcome as Heidegger would wish, the critique he offers concerning Being's neglect can be offered to him. In overcoming Being, Being is purposefully forgotten in its identification with no-thing, when the existence of everything cries out before the subject. Moreover, it should be pointed out that the attempt to overcome metaphysics, is also a metaphysical act in itself (Desmond, 2005:231).

I argue that the fundamental problem of metaphysics is not singularly that of answering the question of why anything is, but facing-up to the possibility that far from overcoming metaphysics, metaphysics never goes away. Being does not fade. Prior to asking questions pertaining to being, being is (Desmond, 2005:231).⁵²

In the encounter with being the subject transcends the subject's self into an experience of wonder and awe which incites questioning about the being of the particular subject before the self (2005:232). This everyday experience of being is the source which informs the research questions of physical and natural science. It is an occurrence wherein the perceiving subject, which is, meets a reflection of being in an entity outside the subject. In being's relational encounter the philosopher is pushed to ask why the something which is before the self – the being which is not *no-thing* but *some-thing* – is at all. This is the elemental metaphysical experience. I hence place Heidegger in opposition to the classical realist approach, although he does attempt to save being in severing it from traditionally defined metaphysics.

2.5. Dawkins and faith:

The Heideggerian concern over the decline in Being can be carried over to scholarship by scientists who locate themselves within the Positivist tradition, particularly adherents of scientism. Among those who follow a strong thesis of scientism is the Biologist, Richard Dawkins.⁵³ Dawkins' evolutionary research is grounded in the works of his doctoral

⁵² "We do not go first towards something, but find ourselves going out of ourselves because something has made its way... into the depths or roots of our being..." (Desmond, 2005:232).

⁵³ Dawkins, b. 1941.

supervisor Nikolas Tinbergen, the socio-biologist Edward Wilson, and Jacques Monod, for whom chance is held as the sole driving force behind natural selection (Monod, 1972:112-113, Giberson & Artigas, 2007:30).⁵⁴ More tempered than Monod, though, Dawkins' evolutionary theory gives chance an important, but not absolute, role in the process of evolutionary development via cumulative selection (Antonites, 2010:126-127).⁵⁵

“Chance, luck, coincidence... [these are behind] events that we commonly call miracles [though they] are not supernatural, but are part of a spectrum of... improbable events... Given infinite time, or infinite opportunities anything is possible” (Dawkins, 2006a:139).

I take issue with Dawkins' formulation: does it follow that while natural selection is a factor driving evolution, no design is possible? (2007:32) Moreover, are chance and design mutually exclusive?

Whilst Dawkins many works touch on philosophical themes, perhaps none does as directly as *The God Delusion* (2006b:1). The core of *The God Delusion's* argument is that the article of faith that God exists (“*the God hypothesis*”) should be investigated “... as skeptically as any other...” hypothesis because *it is a scientific statement concerning the universe* (2006b:2).⁵⁶ ⁵⁷ Herein resides a misunderstanding of Dawkins about the delineation between science and metaphysics as he equates a metaphysical problem as a scientific one. The logical conclusion – which comes out in Dawkins' scientism – is that science itself has the methodological and explanatory ability to enter into meta-scientific territory. In this manner, all that is must be reduced to scientific discourse and analysis. Moreover, it demonstrates Dawkins' dismissal of the possibility of knowledge outside science.^v

Indeed, for Dawkins the hypothesis of God and the possibility of God as designer are equivocal and impossible (2006b:2). Darwinian natural selection explains away “... *the*

⁵⁴ “... [Chance] is the sole conceivable hypothesis, the only one that squares with observed and tested fact” (Monod, 1972:112-113).

⁵⁵ Monod, though perceive direction in the chanceful evolutionary process (Monod, 1972:188, Scott, 2011:92).

⁵⁶ “I shall define the God Hypothesis more defensibly: there exists a super-human, supernatural intelligence who deliberately designed and created the universe and everything in it, including us... *God in the sense defined, is a delusion... a pernicious delusion*” (Dawkins, 2006a:31).

⁵⁷ While Dawkins presents his works as scientific, they contain philosophical aspects (Giberson & Artigas, 2007:34). Pondering being, the nature of the universe, etc., does not fall within the boundaries of hard science's explanatory method or ability.

illusion of design in the living world...” and conscientises the scientifically inclined to other such naturalistic explanations expanded on a cosmic level (2006b:2). While natural explanations are necessary and likely, the question of cause behind explanations remains. Dawkins attempts to scientifically remove the Creator by appealing to natural causes. But, in doing so these causes’ being remains unaccounted for.⁵⁸

So, the “God-hypothesis” is constructed as a question of science (McGrath & Collicut McGrath, 2007:6-7).⁵⁹ However, if God is not provable using physical/natural explanations how could God be disproved by the same sort of argument? Oftentimes arguments like the “Ontological Argument” of Saint Anselm of Canterbury or the “Five Ways” of Saint Thomas Aquinas are conceived as “proofs for God’s existence” (2007:7). However, upon examination these are not proofs at all (2007:7). Rather, they are arguments which demonstrate the rationality in belief in the existence of God (2007:7). Here, faith in the existence of God is held prior to the attempt to demonstrate that such faith is inherently consistent (2007:8).

In his “philosophy of religion”, Dawkins examines the improbability argument, i.e. it is highly unlikely that complex entities could have emerged by chance alone (2006b:114). Here he argues that many proponents of this argument assume that chance equates to the absence of design (2006b:114). To this, Dawkins adds:

“A deep understanding of Darwinism teaches us to be wary of the easy assumption that design is the only alternative to chance, and teaches us to seek out graded ramps of slowly increasing complexity” (2006b:114).⁶⁰

That Dawkins appeals to “... *graded ramps of slowly increasing complexity*...” points to the presence of direction in the evolutionary process (2006b:114). There is, it appears, more than chance at play in the process of natural selection (2006b:114). “Design” may be an inaccurate term to employ, however, for it is loaded. Nevertheless, that natural selection projects evolutionary adaptations towards complexity indicates some degree of

⁵⁸ Dawkins’ critique on “*Why there almost certainly is no God*” is founded almost absolutely on evolutionary grounds such that his approach becomes something along the lines of “evolutionism” (2006b:112). Moreover, the argument’s near absolutism makes it virtually unfalsifiable.

⁵⁹ Within science, an hypothesis refers to a framework employed by scientists to make sense of repeatable observations (Haught, 2008b:41). Such repeatable observations or experiments form the foundation of any empirical science (2008b:42). God, however, is not a scientific hypothesis to be equated with a repeatable experiment (2008b:43). In this sense Dawkins’ confusion is illustrated in the extreme: the realities he equivocates are certainly not identical. On the one plane of being, particular instances of being are dealt with, whilst on the other is consideration of being itself.

⁶⁰ It is intriguing that Dawkins falls into this same trap (Dawkins, 2006b:188).

necessity and a general course followed by the evolutionary narrative as a whole. Moreover, biological evolution forms part of greater cosmology, wherein there is evidence for – if not “design”, at least – “fine-tuning” as the universe appears “fine-tuned” for the emergence of carbon-based life and consciousness (Rees, 1999:83).^{vi} Such cosmic tendencies – “laws of nature” – themselves require metaphysical consideration: why do these have being? An evolutionary account would not seem thence to be averse to more-than scientific explanations for their completeness.

To the “*God-hypothesis*”, Dawkins insists that natural selection removes any possibility of design or of supernatural agency (2006b:188). Indeed, the position of faith that God could have employed natural selection to bring about biological life is seen by Dawkins as a “*lazy God*” who “... *wouldn't need to do anything at all!*” (2006b:118). Even if God were conceived in a deistic and “lazy” manner, the existence of natural selection does not prove that God does not exist.⁶¹ All that can be shown is that a process is in place determining the adaptation and survival of biological life. If extrapolated backwards to its logical conclusion the Dawkinsian argument is that natural selection simply exists, at most the product of a cosmos which created itself because of the existing laws of nature. The bringing into being of such laws which themselves are created physical entities is not considered. The uncaused God as designer and creator is replaced by uncaused and unexplained laws which bring about the necessarily guided natural process of natural selection (McGrath & Collicut McGrath, 2007:9).

Dawkins is justified in criticising arguments for the existence of God of the “God-of-the-gaps” variety: that science cannot explain something does not mean that God should be the sole inexplicable answer filling the explanatory gap (2006b:125). Naturally, as scientific knowledge advances, so the explanatory gap narrows (2006b:125). Moreover, any form of faith which exults in breaks of understanding should be condemned as inadequate (2006b:126). This is in keeping with the Scholastic tradition of faith requiring reason.⁶² With that acknowledged, it should not be reasonably argued by Dawkins that lack of understanding is a characteristic of faith (2006b:126).⁶³

⁶¹ Through the utilisation of the scientific method, in as much as science cannot prove that God exists, so too science cannot prove that God does not exist. In this instance lies an absolute example of the limitedness of “hard” science to respond to problems of its own ilk (following the delineation of Dawkins).

⁶² “... *I do not seek to understand in order to believe, but I believe in order to understand. For I believe even this: that unless I believe, I shall not understand*” (Saint Anselm of Canterbury, 2000:93).

⁶³ Dawkins assumes that reasonable faith is impossible (Giberson & Artigas, 2007:38). His prejudice is revealed in a statement such as the following:

Furthermore, it is an uninformed position to propose that faith necessitates the assumption that areas where there is insufficient explanation are indicators of the presence of the hand of God (2006b:128). Dawkins' generalisations against faith-positions are revealed in his passionately emotive imagined response from an "intelligent design theorist" to ignorance of science:

"If you don't understand how something works, never mind: just give up and God did it. You don't know how the nerve impulse works? Good! You don't understand how memories are laid down in the brain? Excellent! Is photosynthesis a baffling complex process? Wonderful! Please don't go to work on the problem, just give up, and appeal to God. Dear scientist, don't work on your mysteries. Bring us your mysteries, for we can use them. Don't squander precious ignorance by researching it away. We need those glorious gaps as a last refuge for God" (2006b:132).

Neither the project of faith nor that that of metaphysics should relish in such witlessness.⁶⁴ While there are limits to the understanding possible within the scientific framework these should not be the refuge of the believer to justify belief (McGrath & Collicut McGrath, 2007:11). Thence, while justified in criticising "God-of-the-gaps" theologies, Dawkins' sweeping statements misrepresent the informed-faith position, implying that all faith is necessarily the domain of the ignorant and unthinking. Rather than hiatuses in scientific knowledge as source of belief, faith should be vilified by the correspondence between scientific theory and the entities about which the theories concern (McGrath & Collicut McGrath, 2007:12).

Turning to cosmology, Dawkins follows a similar line as he did with natural selection. He argued that the anthropic principle images a cosmos without design and a planet which – just by chance of the vast numbers of planets – happens to have the correct conditions for life to have emerged upon it (2006b:136).⁶⁵ A dilemma is presented: design (and God)

"... [O]ne of the truly bad effects of religion is that it teaches us that it is a virtue to be satisfied with not understanding" (Dawkins, 2006b:126).

⁶⁴ A theological conception of faith does not include belief *sans* evidence or understanding (Haught, 2008b:3). Faith should not be limited to a naïve epistemological reductionism (2008b:5). Instead, faith involves a positioning of the self in relationship with the Divine (2008b:5). As such, the faith-experience is more than a guileless compilation of hypotheses, such as the "God-hypothesis", but an entire manner of living (2008b:13).

⁶⁵ Dawkins makes reference to Rees' "fine-tuning" argument which has just been referred to (2006b:141).

or chance (and no God) (2006b:136).⁶⁶ Both this planet that is favourable to the emergence of carbon-based life and the manifold others that are not, as well as the 10^{500} universes said to exist by multiverse cosmologists, still require accounts for their being (Hawking & Mlodinow, 2010:118-119).⁶⁷ The “problem of creation” does not disappear, and Dawkins’ appeal to Rees’ “six numbers” for a fine-tuned cosmos does not provide a tolerable explanation (Dawkins, 2006b:145). His admittance that the combination of such numbers seems as improbable as the existence of God, weakens the argument (2006b:143).⁶⁸ For Dawkins, however, it is justifiable to accept the existence of elemental and chemical conditions requisite for life simply because:

“... there are between 1 billion and 30 billion planets in our galaxy, and about 100 billion galaxies in the universe.... here we are talking about odds of one in a billion. And yet... even with such absurdly long odds, life will still have arisen on a billion planets – of which, Earth, of course, is one” (2006b:137-138).

Why is it that these planets have existence? Why do they have life? Why is it *necessary* that life should have emerged? Any answer provided would be evidentially unsound as it would be grounded in the reasonably inferred alone. Dawkins’ argument hinges upon the *assumption* that life emerged on a planet friendly to the possibility of life, making life not unique to earth, as it is statistically supposed that many other planets could have life, too (2006b:140). Regardless of whether this is true, the problem of creation falls outside of science’s explanatory power and has still not been responded to. But for Dawkins this problem is one of science (2006b:154). In response to theologians returning the problem of creation to metaphysical consideration, Dawkins replies:

“To suggest that the first cause, the great unknown which is responsible for something existing rather than nothing, is capable of designing the universe and of talking to a million people simultaneously, is a total abduction of the responsibility to find an explanation. It is a dreadful exhibition of self-indulgent, thought-denying skyhookery” (2006b:155).

⁶⁶ *“What the religious mind fails to grasp is that two candidate solutions are offered to the problem. God is one. The anthropic principle is the other. They are alternatives”* (Dawkins, 2006b:126).

How the anthropic principle or God are necessarily mutually exclusive, however, remains to be clearly articulated.

⁶⁷ Once more Dawkins employs Rees’ arguments, this time for the existence of the multiverse (2006b:145). If the multiverse does exist, we can be sure that within at least one “bubble universe” there exists carbon based life, for humans are evidence of that (2006b:145).

⁶⁸ *“A God capable of calculating the Goldilocks values for the six numbers would have to be at least as improbably as the finely tuned combination of numbers itself, and that’s very improbable indeed...”* (Dawkins, 2006b:143).

While a theistic response to Dawkins could be that such an image of the Divine is not an acceptable theological or philosophical conception, Dawkins would not be amenable to any argument which accepts a cause touching on God by any name.^{vii} Consideration, though, of the problem of creation has still been done which is more than can be said for the Dawkinsian appeal to *existing* natural laws. But Dawkins holds that he has purged humanity of God, for upon consideration of the problem of creation, he states:

“[M]y theologian friends returned to the point that there had to be a reason why there is something rather than nothing. There must have been a first cause of everything, and we might as well give it the name God. Yes, I said, but... God is not an appropriate name...” (2006b:155).⁶⁹

It is to the issue of why there is anything, including natural laws and self-creating universes, which Dawkins must return. And to that question no scientific explanation can be given, for it is not an empirically verifiable or falsifiable problem. A scientific theory must:

“... convey information about the empirical world only if they are capable of clashing with experience; or more precisely, only if they can be systematically tested, that is to say, if they can be subjected... to tests which might result in their refutation” (Popper, [1934]2002: 315).

An hypothesis for why the cosmos or multiverse exists, or one which attempts to prove that there is no design or God in the physically extant, cannot clash against anything which can prove or disprove these assertions. These are postulates which transcend the physical, therefore, they are meta-physical in the truest possible sense. They draw out the metaphysical dimensions present in all scientific theory, i.e. the set of assumptions held by the scientist concerning the way things are (Haught, 2008a:89). It is futile to seek value-free science, as all science is the product of human beings, socialised within and towards particular value systems. All scientists, including Dawkins, should remain conscious of the explanatory limits of science, as well as the background which has coloured all scientific theory (Haught, 2008a:95).

A fundamental assumption which Dawkins and other “New Atheists” hold is the faith which they place in the scientific method, though oftentimes there is a lack of awareness of this leap (Haught, 2008b:47). Haught describes this faith position in terms of trust:

⁶⁹ The emphasis is the author’s insertion.

“At the foundation of every human search for understanding and truth including the scientific search, an ineradicable element of trust is present” (2008b:47).

Within the “scientific” paradigm, the sole acceptable source for knowledge is science itself. However, the only means to verify this paradigm is scientific (2008b:45). Herein then is a circular argument. Scholars like Dawkins are thus caught in a closed system of corroboration: that which is the absolute source of knowledge stands only because it is self-confirmed. And in this there is a leap: faith is placed in an assumed and externally unverifiable approach to the obtainment of knowledge, which can never rely solely on itself as a closed system (2008b:45). Despite his clear rejection of faith, Dawkins nevertheless embraces a faith (in science) somewhat similar to that which he rejects:

“... [F]aith... means blind trust, in the absence of evidence, even in the teeth of evidence... Nothing is more lethal [for faith]... than a tendency to look for evidence... [B]lind faith secures its own perpetuation by the simple unconscious expedient of discouraging rational inquiry. Blind faith can justify anything” (2006c:198).

Faith, for Dawkins, is childish, irrational, and ties not to the real. Still, his scientism – in which so much faith is placed – avoids mature reasoning by discounting the limits of science: science is the absolute source of certain knowledge. Quite the contrary is true, however:

“... there is indeed a limit upon science... made very likely by the existence of questions that science cannot answer, and that no conceivable advance of science would empower it to answer... How did everything begin? What are we all here for?... Doctrinaire positivism – now something of a period piece – dismissed all such questions as nonquestions or pseudoquestions such as only simpletons ask and only charlatans profess to be able to answer” (Medawar, 1985:66).

The movement of “New Atheism” is here represented by Dawkins. In the “New Atheistic” discounting of faith positions and reactionary embracement of science as absolute, “New Atheism” ascends to faith in spuriously embracing scientism. The dismissal of the source of being as an hypothesis able to be (dis)proven by empirical science as well as the disdainful approach to religious faith – despite the scientific faith position – results in my argument that the bounds of science are not broad enough to encapsulate, or to falsify, the propositions of faith.

In light of the main concern of this chapter, namely, the decline in being in contemporary philosophy, my exploration of Dawkins has demonstrated two significant points for this

study. In the first instance, metaphysics is not totally removed from claims to knowledge simply because it is “not science”, as being is. Secondly, the reasonable ascent to faith cannot be discounted in the scientific reduction of all truth claims to “hard” science that do not account for every dimension of reality.

2.6. Hawking and philosophy:

Dawkins’ shift of metaphysical questions out of relevance, in dismissing any consideration of being or of a faith perspective – whether in the Divine or in science – enabled a retreat into the absoluteness of the scientific method. Hawking’s line of argument is somewhat different, though nevertheless scathing of broader philosophical issues.⁷⁰ Regardless, Hawking and Mlodinow’s 2010 work, *The Grand Design*, begins with a consideration of the primordial philosophical question: why does anything exist?⁷¹

“Living in this vast world that is by turns kind and cruel, and gazing at the immense heavens above, people have always asked a multitude of questions: How can we understand the world in which we find ourselves? How does the universe behave? What is the nature of reality? Where did all this come from? Did the universe need a creator?” (Hawking & Mlodinow, 2010:5)⁷²

The authors acknowledge that these are questions properly posed by philosophy (it might be added: by metaphysics, specifically) (2010: 5).

“... [B]ut Philosophy is dead. Philosophy has not kept up with modern developments in science, particularly physics...” (2010:5).

In this statement the renowned scientist, Hawking, presents physical science as the only means to verifiable “scientific knowledge”. Implicit is the need for experimental evidence for claims to truth. The positivist strain of thinking so present in the scientific approach is alluded to here, albeit indirectly.^{viii} Here, however, lies an intriguing contrast when the afore-quoted metaphysical questions are subsequently to be answered by the findings of physical science, especially as positivism rejects metaphysics! If “... *Philosophy is dead*”, questions with a philosophical nature should become redundant rather than forming the

⁷⁰ Hawking, b. 1942.

⁷¹ “... [P]hilosophy has constantly and always asked about the ground of beings. With this question it had its inception, in this question it will find its end...” (Heidegger, 2000:26).

⁷² In *The Grand Design*, Hawking’s collaborator is Leonard Mlodinow. He is an American Quantum and Mathematical Physicist, presently working at Caltech in Pasadena, CA.

foundational problem statement of a scientific text (2010:5). Nevertheless, if these questions are relevant, the proper method employed to explore these has a place and perhaps even bearing!

Returning to the reasoning for why philosophy is dead, it is true that much contemporary philosophy is centred on issues in which scholars see little relevance of current “hard” science to their research. A marked disparity should therefore be emphasised between philosophies which take “hard” scientific theories into account and some other anthropological areas of philosophical concern. Contrary to this latter approach, philosophy informed by “hard” science tends towards less anthropocentrism in its directedness to cosmic realities. The philosophical cosmologist, for example, is concerned with collective scientific engagement with hypotheses, but can never be completely objective; for she is embodied, socialised, etc. The human construction of cosmology is laden with pre-existing, worldview-forming values.

While Hawking is critical of philosophy this condemned discipline is present in his work. A particularly glaring contradiction in relation to the death of philosophy is evident in the following quotation:

“To understand the universe at the deepest level, we need to know not only how the universe behaves but why.

Why is there something rather than nothing?

Why do we exist?

Why this particular set of laws and not some other?” (Hawking & Mlodinow, 2010:10)

These are metaphysical questions! Nevertheless, Hawking would propose to solve these problems with theories of “hard” science alone, i.e. without philosophical contribution!

Hawking and Mlodinow’s work is rooted in “*scientific determinism*”, further evidence of the positivistic slant of the work (2010:34). “*Scientific determinism*” proposes that everything can be explained by “*laws of nature*” (2010:34). Of interest in this context is the problem that laws of nature can account for *all things*: this is a non-material, philosophical stance determining the metaphysics and epistemology employed by the researcher. In this paradigm a statement of the nature of reality is made: whatever is, is explainable naturally and must be reducible to natural laws, i.e. all that is has a physical character. Thus, Hawking and Mlodinow can venture into realms outside of physical science, for all things

are to be understood from within science! Therefore, a definitive declaration of “creation” (not a properly scientific concept), is pronounced:

“Because there is a law like gravity, the universe can and will create itself from nothing... Spontaneous creation is the reason there is something rather than nothing, why the universe exists, why we exist” (2010:180).

This assertion is incongruous with conventional physics, however, for the First Law of Thermodynamics states:

“... [T]he value of something, namely the total energy, remains constant despite the fact that all kinds of complicated processes may be taking place. The total energy after the process is equal to the total energy before the process” (Penrose, 2004:690).

The First Law implies the *Law of Conservation*, whereby energy can never be created or destroyed: Hawking’s hypothesis that gravity *creates ex nihilo* opposes this natural law. Philosophically, recourse to natural laws does not explain “*Why is there something rather than nothing?*” (2010:10) The question is pushed back to avoidance. Assuming that scientifically discoverable, natural laws can account for being does not explain why laws themselves exist. Without philosophical discourse the problems of creation and being remain unsolvable.

Continuing to pose philosophical questions, Hawking and Mlodinow wonder: “[H]ow do we know we have the true, undistorted picture of reality?” (2010:39) Since all scientific theory is the product of individual scientists, the Hawking/Mlodinow conclusion is justified: “... *there is no picture- or theory-independent concept of reality*” (2010:42).⁷³ For Hawking, thence, one cannot choose between models of reality, for as researchers posit alternative models of reality, one cannot state which model is more real (2010:8).⁷⁴ Thus, M-theory is embraced, for with it, it is argued that understanding may require the employment of “... *different theories in different situations...*” (2010:117). Each theory could describe reality of its own accord such that multiple realities exist as a consequence that numerous possible models can represent observations (2010:117).⁷⁵ The number of these inferred

⁷³ The scientific enterprise includes the setting up of the scientific experiment, the employment of apparatuses, the gathering and interpretation of data, all of which are influenced by the scientist.

⁷⁴ “... [T]here is no single theory that is a good representation of observations in all situations” (Hawking & Mlodinow, 2010:8).

⁷⁵ “According to M-theory, ours is not the only universe. Instead, M-theory predicts that a great many universes were created out of nothing. Their creation does not require the interventions of some

universes is astonishing both in its vastness and in its reemphasising the problems of creation and being: $\pm 10^{500}$ universes (2010:118-119).⁷⁶

Throughout science's history, theories have begun as conjecture and the empirical evidence has later arisen. However, it is not "scientific" to make absolutely certain declarations of the existence of entities of which there is no empirical evidence as was drawn out by Carnap in his critique of metaphysics ([1932]1959:76).^x If Hawking, with his own positivist leanings, was exposed to Carnap's logical analysis, he would fall short of having done "science"!

Nevertheless, it is possible, as evidenced by Hawking that from scientific research metaphysical questions can be posed. Thus, the philosophical tradition of knowledge as a continuum established in "natural philosophy" should be called to mind. Herein, there is no categorical distinction between the boundaries of philosophy and science (McMullin, 1981:182). Where science can no longer explore, metaphysics – that which transcends the explanatory power of science – can come into relevance.⁷⁷

In this study, therefore, both metaphysics and its parent discipline, philosophy, will be located as relevant and necessary for the discussion of truth in the problem of creation. As Haldane points out, even Hawking and Mlodinow employ philosophy despite condemning it! (2011:44). In surveying the metaphysical question of why there is something rather than nothing, philosophy – metaphysics specifically – is unavoidable. Relentless determination to employ the "method" of science in answering metaphysical questions that do not disappear (as revealed in Hawking and Mlodinow), or the total removal of metaphysics and philosophy as meaningless, has inadequately – or not – accounted for being. Any attempt at removing the problems of creation and being simply ignores the fact that, at the minimum, a question which exists has been posed yet its being is disregarded.

supernatural being or god. Rather these multiple universes arise naturally from physical law" (Hawking & Mlodinow, 2010:8-9).

⁷⁶ That the multiverse exists is a categorical statement of belief made by Hawking and Mlodinow: "... many universes exist with many different sets of physical laws" (2010:136).

⁷⁷ "What may appear 'philosophic' at one time may well turn out to be indisputably 'scientific' at another, when theoretical formulations that are in one way or another empirically testable are in the making" (McMullin, 1981:182).

2.7. Conclusion:

The historical path we have traced has taken us through key points in the decline of the study of being. As the emphasis of this research is upon the historical reconstruction of Truth, we have been directed to being in accord with the Thomist definition of the true.⁷⁸ Herein, the extra-subjective object and the thinking subject encounter one another. Truth emerges as the encounter's product in the subject articulating being. From this particular paradigm, choosing to ignore being leads to realistically disconnected theories.

I have noted that despite Heidegger's identification of the decline of metaphysics, the end of metaphysics heralded by the Kantian critique remains an ostensible hurdle to be crossed (1962:21). Being, according to Heidegger, transcends knowability for it cannot be theoretically constructed (2000:39, 2005:257).

The initial motivation for the eventual nigh decimation of the study of being (metaphysics, in its sub-discipline of ontology) emerged from Kant's metaphysical speculation ([1787]2010:2). For Kant, the thinking subject could only present appearances of objects to itself, but could never know any object as "*Ding an sich*" ([1787]2010:24). Historically, Kant had been brought to this assertion by his exposure to Humean metaphysical scepticism (Kant, [1783]2007:4, Hume, [1748]2008:86). Kant's thinking drew a wedge between the thinking subject and mind-independent objects (being) in his deeming metaphysics as illusory ([1787]2010:211). But, he sought to redeem objective reality – and with it metaphysics – through his embracement of "practical reason" ([1787]2010:453).

Nietzsche's "turn to the subject" furthered the chasm between subject and object. For him, the subjective articulation of a symbol (word) is not connected to the referred object: the assignation is arbitrary and the relation dissonant (2005:16). In fact, ontology (of the object) was not only of no importance for Nietzsche, but totally annihilated by him (2005:25).

From the Analytic tradition, Wittgenstein – followed later by Rorty – did not deem the human linguistic tool of understanding as directing to anything outside of language

⁷⁸ "... [Truth] is defined by the conformity of intellect and thing; and hence to know this conformity is to know truth" (Aquinas, *Summa Theologica*, I, Q. 1, A. 2.).

(Wittgenstein, 1986:93, Rorty, 1989:4). The spirit of the Vienna Circle that had so influenced Analytic thought had contributed to the Analytic approach articulated above. Carnap, for example, had removed access to being in his deeming metaphysical statements as non-empirical and meaningless (1959:77). The tendency has continued in scientific scientists who metaphysically presume that only empirical statements have worth (Hawking, 2001:31, Dawkins, 2006b:2).

The negative conceptualisation of the “problem of being” is thus that it is ontologically inaccessible, meaningless, or it is dealt with as a matter for empirical science. However, the question of why anything exists is not a problem to be dealt with scientifically. Following its methodology, science can only deal with extant entities as opposed to why those same entities are apparent.

Nevertheless, I have demonstrated that the discussion of existence has been relegated to the annals of intellectual history. Truth, thereafter, has become a work of fiction, for all that can be known is the subjectively constructed. Indeed, the pursuit of metaphysics has been wiped off the intellectual landscape. No longer can a reputable scholar safely refer to metaphysics, being, God, faith, or Truth without ridicule, particularly from the radical empiricist or subjectivist schools.

Regardless of the acknowledged difficulty in attaining metaphysical knowledge, discussion of metaphysics is an imperative in light of the *fact of being*. The writer writes, the reader reads, and being is encountered by the person in and around herself at every moment of existence. Therefore, the fundamental metaphysical question always remains to be answered: why is there anything?

This research must seek to overcome the rejection of being. Naturally, the arguments against these must be taken seriously due to the influence which these have had on the development and current state of philosophical discourse. I thus propose that an alternative position – reclaimed from the history of philosophy – is timely and necessary.

In terms directly of the science/religion debate, scientists like Dawkins and Hawking have been influential in the generation of an often unquestioned presupposition that has come to be held by many in popular discourse. As advocates of scientism they have neatly couched a false dichotomy in the form of conditional argumentation:

If one is a person of reason, then one cannot be a person of faith.
Conversely, if one is a person of faith, one cannot be reasonable.

With grounding in Thomist thought, as I progress with this project, I will respond to the falsity of the presupposition articulated. If logically, a truth cannot contradict a truth, in Truth – as reflective of being – there can be no tension between the more universal categories of reason and a rational position of belief (Leo XIII, 1879).

However, in order for truths to be synchronised with being, Hawking's critique of philosophy is of relevance.⁷⁹ To have truthful knowledge reflective of the way things are, the knowledge utilised must be current, diverse and transdisciplinary. Philosophers cannot be unaware of "hard" science. As a philosophical work, though, I will return to some of philosophy's historical texts, for therein one is able to locate the source discipline of all academic pursuits, which by its ancient nature engaged across all spheres of knowing. The particular disciplines that will be of relevance in this work's development are philosophy, cosmology, and theology.

Among the recurring questions of philosophy – as this chapter has shown – is the fundamental metaphysical problem: that philosophers can question, imposes the problem of being upon philosophy. As long as there are self-reflectively conscious beings, metaphysics can never be annihilated!⁸⁰ This oftentimes misunderstood branch of knowledge concerns the primordial:

"... [T]he metaphysician is a man [sic] who looks behind and beyond experience for the ultimate ground of all real and possible experience"
(Gilson, 1999:247).

That metaphysical speculation has been constant throughout the history of philosophy indicates that metaphysics is founded within the human cognitive faculty (1999:248). Ultimately, it is in the reasonable person's engagement with the real that propositions relating to the real are generated, and in which being always comes to the fore (1999:251).⁸¹ It must be emphasised that no proposition can be formulated without relation to an entity with being, even if that entity is a cognitive one (1999:251).⁸² The

⁷⁹ "... [P]hilosophy is dead. Philosophy has not kept up with modern developments in science, particularly physics..." (Hawking & Mlodinow, 2010:5).

⁸⁰ "Philosophy always buries its undertakers" (Gilson, 1999:246).

⁸¹ Being is the primary concern of metaphysics "... as the science of being" (Gilson, 1999:252, 255).

⁸² "... [I]f it is true that human thought is always about being; that each and every aspect of reality, or even of unreality, is necessarily conceived as being, or defined in reference to being, it follows that the

metaphysical search into the transcendent is therefore innately human (1999:248). Thus, Gilson defined “metaphysics” as:

“... [T]he knowledge gathered by a naturally transcendent reason in its search for the first principles, or first causes, of what is given in sensible experience” (1999:248).

In seeking to better understand the real, metaphysics directs the thinking subject to transcend self into extra-subjective reality. This reality is generalised, hence it cannot be explored by any particular science, whether Physics, Theology, Linguistics, etc., for it supersedes all particulars (1999:249). As a consequence metaphysical problems can only be explored in and through metaphysics: no other science can adjudicate (1999:249).⁸³

In returning to history, it is plainly apparent that the metaphysical questions that were of importance for many historical philosophers remain relevant to contemporary philosophy. If no cognitive representation can be formed without reference to being, this conditional argument’s logical conclusion is that a thorough study of reality must include metaphysics (Gilson, 1999:253).

I do not seek a return to a “golden age” of philosophy, however (Gracia, 1992:28). Instead, in returning to historical problems I argue that contemporary philosophers will once more have a singular object of investigation founded in robust aspects of its history: being, as the constant experience of the philosopher immersed in the real (Gilson, 1999:256-257, Gracia, 1992:29).⁸⁴

“One has today so few companions upon the roads of metaphysics... [because] the modern man [sic] hardly thinks anymore of these things. He bathes in the divine without being aware of it” (Gilson, 1988:146).

understanding of being is the first to be attained, the last into which all knowledge is ultimately resolved and the only one to be included in all our apprehensions. What is first, last and always in human knowledge is its first principle, and its constant point of reference” (Gilson, 1999:252).

⁸³ “[A]s metaphysics aims at transcending all particular knowledge, no particular science is competent either to solve metaphysical problems, or to judge their metaphysical solutions” (Gilson, 1999:249).

⁸⁴ Historians of all varieties have to deal with the problem of their reconstructivism being anachronistic: reinterpreting historical events – so disparate from the hermeneutical horizon of the historical interpreter – and ideas in terms of contemporary experience and language runs the risk of representing inaccurate portrayals (Jardine, 2009:292). However, an awareness of the problem will have to suffice, since it is impossible for the historian of ideas to divorce from contemporary worldviews that which form the historian’s understanding (2009:293).

Without a clear connection to “that which is”, it is impossible to do science which concerns the real, for reality to which science conforms is what gives the scientific enterprise its purpose. Hence, a reclamation of the importance of metaphysics within philosophy and science needs to be developed. If the perceived and constructed is all that remains of the human apprehension of reality – and of the human self-manifestation in reality – what does science expose? Any truth in science is removed! Thus, I argue for a balanced position between the thinking subject (the doer of science) and the positivist spirit (that imbues scientific methodology).⁸⁵ Science’s object is nevertheless objective in itself. The moment observation occurs, however, in the development of scientific theory, the thinking subject has an essential role to play. Nevertheless, if science’s task is to reveal and account for extant phenomena through humanly construed theory, science could only be considered authentic if being is accounted for.

The physical/metaphysical continuum places a reemphasis upon reality as an inseparable whole united in being that is True (“in-itself”). Despite the limits of the person in perception/perceptual ability, by an awareness of boundaries in science and where meta-questions lead, the human is directed towards a more holistic apprehension of reality. With such awareness the perception of reality is enriched. To live in separation from what is, is to choose to ignore the real. But, in the relationship between apprehension and what is apprehended is a convergence of both Modern and Postmodern epistemologies in an historical metaphysically founded epistemology.

From the classification of the problems of creation and being we are lead to the theme of exploring the unity of Truth within science and faith. It is in between these that the essential metaphysical problem most acutely comes to primacy. I see the employment of Aquinas as judicious in this task as the historical reconstructivist methodology will proffer in subsequent chapters.^x Thomism can be used as a typology for relating science to faith, cased in an epistemic metaphysics. Herein, being remains pivotal, for it is everything demanding explanation for its existence.

“... [N]either science nor faith has managed to diminish the other; quite the contrary... they cannot develop normally without each other, for the simple reason that they are both animated by the same life” (Teilhard de Chardin, 2003:203).

⁸⁵ The positivist attitude – especially manifest in scientism – continues to assume that it is possible to observe and construct theory in an objective manner.

Notes:

ⁱ A cursory overview of the history of science demonstrates the relation between realism and ontology, we consider just two instances:

The writer of the preface to Copernicus' *De revolutionibus orbium coelestium*, Andreas Osiander, interpreted the work instrumentally (Stanford, 2006:400). But, Copernicus' writings demonstrate that he believed his heliocentric theory demonstrated the way things were:

"In the center of all rests the Sun... as if on a kingly throne, governing the family of stars that wheel around" (Copernicus, *De revolutionibus*, I(10) in Gingerich, 1993:34).

Centuries later, the nineteenth century's Charles Darwin, too, posited a realist approach to his biological findings:

"Man still bears in his bodily frame the indelible stamp of his lowly origin" ([1871]2004:405).

ⁱⁱ In referring to the decline in the Middle Ages and the advent of Modernity in the Renaissance (and one of its effects, the Scientific Revolution), use of the tripartite division of history into the three epochs: ancient, medieval and modern history is made. It must be acknowledged that scholars of world history have critiqued this division of history. Still, it is founded in Renaissance Humanism (Green, 1995:100).

Before AD 1492 it was impossible to divide world history into universal epochs due to the lack of interaction between world regions (1995:101). History was until then rather parochial. The identification, therefore, of the dawn of modernity in c. AD 1500, following the tripartite division of history with the Middle Ages coming to a close at this time is reflective of a particular European ideological dominance, wherein world history was forced to conform to the historical events of one particular continent (1995:102).

With this recognised, Modernity should be here understood as beginning in c. AD 1500 in correspondence to the event of the Scientific Revolution, which was a European moment of world history.

ⁱⁱⁱ Rorty argued that Wittgenstein's *Tractatus* was the first instance wherein Philosophy of Language was posed as the replacement to defunct metaphysics (1993:340). In his Preface, Wittgenstein proposed:

"... [We can] draw a limit to thinking... [that can] only be drawn in language and what lies on the other side of the limit will be simply nonsense" (1922:23).

However, Dummett saw the origins of the "linguistic turn" in the historically earlier Gottlob Frege (1848 – 1925), who defined the object of philosophical thought as the careful scrutiny of the human subject's thought structure (Dummett, 1978:458). Such was his conviction of the primordial importance of language that Dummett declared:

"... [T]he only proper method for analysing thought consists in the analysis of language..." (1978:458).

Indeed, Frege had argued that propositions determine the meaning of words, as opposed to any entity extra to the linguistic statement:

"... [I]t is only in the context of propositions that words have any meaning, [thus] our problem becomes this: To define the sense of a proposition..." ([1884]1960:73).

Disregarding the historical discrepancy, Frege, the later Wittgenstein, Rorty and Dummett all conceive language as the all-encompassing foundation of the human experience with which philosophers should contend. Heidegger, from the Continental tradition, opposed the linguistic turn as the sole concern of philosophers:

"... [T]he scientific and philosophical investigation of languages is aiming ever more resolutely at the production of what is called 'metalanguage.' Analytical philosophy, which is set on producing this super-language, is thus quite consistent when it considers itself metalinguistics. That sounds like metaphysics—not only sounds like it, it is metaphysics. Metalinguistics is the metaphysics of the thoroughgoing technicalization of all languages into the sole operative instrument of interplanetary information" (1971).

iv Critical of metaphysics, especially during the Analytic Philosophical engagement with Logical Positivism (Paterson & Pugh, 2006:xviii), an analytic judgement of metaphysics was summed up by Carnap:

“... [W]hat, then, is left over for philosophy, if all statements whatever that assert something are of an empirical nature and belong to factual science? What remains is not statements, nor a theory, nor a system, but only a method: the method of logical analysis... [which] serves to eliminate meaningless words, meaningless pseudo-statements” (1959:77).

A statement which cannot be empirically verified, for Carnap, is meaningless. This is the case with metaphysical statements. Still, despite an approach among some Analytic Philosophers (as in the later Wittgenstein, Russell and Carnap) against metaphysics, there also came to be metaphysicians among Analytics, too (Paterson & Pugh, 2006:xviii; Zimmerman, 2004:xix).

As Analytic Philosophers distanced themselves from Positivism, some began to engage with historical philosophical texts, such as those of Aristotle and Aquinas (Paterson & Pugh, 2006:xviii). Slowly a tradition which took such texts seriously emerged among analysts that in the 1990's John Haldane was able to coin “Analytical Thomism”, which:

“... seeks to deploy the methods and ideas of 20th century philosophy – of the sort dominant within the English speaking world – in connection with the broad framework of ideas introduced and developed by Aquinas” (Haldane in Paterson & Pugh, 2006:xx).

Among problems unavoidable, even by analysts, in Thomist thinking is metaphysics (Paterson & Pugh, 2006:xxi). It is thus incorrect to make a declaration that all analysts write-off metaphysics as nonsensical.

v The assumption that outside science there can be no truth is the essential premise of “scientism” rather than “science” (Giberson & Artigas, 2007:39). But, the hypothesis cannot be scientifically provable as it is a metaphysical statement regarding the nature of reality (2007:40). From within a particular system, such theorising declares metaphysically that nothing outside itself exists. The scientific paradigm is therefore an example of circular reasoning, which fails to acknowledge that reflection on the scientific enterprise is itself beyond science (Haught, 2008b:11).

“When we reflect on science—its aims, its values, its limits—we are doing philosophy, not science” (Giberson & Artigas, 2007:40).

vi Lord Rees, the British Astronomer Royal, has written extensively on fine-tuning (from an atheistic perspective), arguing strongly in its favour ([1999]2000). His approach to “fine tuning” is connected with the “six numbers” proposed for life to exist. They are:

- $N = 10^{36}$ = the ratio of electrical and gravitational forces between protons (Rees, [1999]2000:2; Ellis, 2007:388).
- $E = 0,007$ = nuclear binding energy as a fraction of rest mass energy (Rees, [1999]2000:2; Ellis, 2007:388).
- $\Omega = 0,3$ = total amount of matter in the universe in critical density units (Rees, [1999]2000:97; Ellis, 2007:388).
- $\lambda = 0,7$ = the cosmological constant in unites of critical density (Rees, [1999]2000:110; Ellis, 2007:388).
- $Q = 10^{-5}$ = amplitude of density fluctuations for cosmic structures (Rees, [1999]2000:131; Ellis, 2007:388).
- $D = 3$ = spatial dimensions (Rees, [1999]2000:149; Ellis, 2007:388).

Rees considers the fundamental problem of metaphysics in that he argues that science cannot explain away being (contrary to Dawkins) (1999:83).

“Physicists may someday discover a unified theory that governs all of physical reality, but they will never be able to tell us what breathes fire into their equations and what actualizes them in a real cosmos” (1999: 83).

vii In his construction of the Divine (Giberson & Artigas, 2007:45), Dawkins' pronounces:

“Any Designer capable of constructing the dazzling array of living things would have to be intelligent and complicated beyond all imagining. And complicated is just another word for improbable—and therefore demanding of explanation... You cannot have it both ways. Either your god is capable of designing worlds and doing all the other godlike things, in which case he needs an explanation in his own right. Or he is not, in which case he cannot provide an explanation” (1996a:68).

Dawkins thus conveniently evades the problem of creation, by simply removing the possibility of the source of the being of anything as improbable or incapable of giving an explanation for creation. That anything is, however, cries out to Dawkins in response.

viii In an earlier work, *“The Universe in a Nutshell”*, Hawking unequivocally stated his support for positivism from the perspective of a practising scientist:

“Any sound scientific theory, whether of time or of any other concept, should in my opinion be based on the most workable philosophy of science: the positivist approach... According to this way of thinking, a scientific theory is a mathematical model that describes and codifies the observations we make... [If these] observations disagree with the predictions [postulated by the theory], one has to discard or modify the theory... [I take] the positivist position...” (2001:31).

A cornerstone of positivism – and a necessary consequence of following it – is the exclusion of metaphysics from claims to knowledge. Carnap argued that the logical analysis of metaphysical statements reveals that these are meaningless and should be eliminated from discourse ([1932]1959:61, 73). The assertion that metaphysical statements are meaningless is arrived at from logical analysis: metaphysical statements cannot be considered as statements ([1932]1959:61). Such *“pseudo-statements”* either contain meaningless terms or are not formulated in a meaningful manner syntactically ([1932]1959:61). The criterion which ascertains if a statement is meaningful is determined, Carnap proposes, by its verifiability ([1932]1959:76).

“A statement asserts only so much as is verifiable with respect to it. Therefore a sentence can be used only to assert an empirical proposition, if indeed it is used to assert anything at all. If something were to lie, in principle, beyond possible experience, it could be neither said nor thought nor asked” ([1932]1959:76).

Metaphysicians, Carnap argues, do not desire either to put forward analytic or empirically verifiable propositions, and as such the language of metaphysics is meaningless, even nonsensical, in its discussion of what is beyond or what undergirds experience ([1932]1959:76).

What Carnap, a member of the Vienna Circle – therefore, an historically influential Logical Positivist – does in *The Elimination of Metaphysics*, is the articulation of the method of the Analytic school of Philosophy, wherein all that remains of Philosophy is the method which seeks to remove from inquiry all that is perceived as meaningless according to the method ([1932]1959:77).

ix While the standard model of the “Big Bang” has become fairly accepted by cosmologists it should be noted that it, too, postulates the existence of entities never observed, e.g. dark matter and dark energy. It is relevant to mention the open letter addressed to the entire scientific community by over four hundred scientists published in the *New Scientist* (182) in 2004, where scepticism about such postulates was pointed out.

“Big bang theory relies on a growing number of hypothetical entities – things that we have never observed. Inflation, dark matter and dark energy are the most prominent. Without them there would be fatal contradictions between the observations made by astronomers and the predictions of the big bang theory. In no other field of physics would this continual recourse to new hypothetical objects be accepted as a way of bridging the gap between theory and observation. It would, at the very least, raise serious questions about the validity of the underlying theory” (Lerner, 2004:20).

These same physicists furthermore point out that big bang cosmology is not the only option available for cosmologists, especially in light of steady-state and plasma models (Lerner, 2004:20). Nevertheless, that the big bang model is presented as the only model does for our physicists raise a particularly glaring problem: a central tenet of science is the measuring of postulated theory against observations, rather than against unobserved entities (Lerner, 2004: 20).

× The historical reconstructivist methodology that is to be employed includes analysis of primary texts of Saint Thomas Aquinas (among these the *Summa Theologica*, the *Summa contra gentiles*, and the *De Veritate*).

Hermeneutics is thus of relevance in the reconstructivist process, as text analysis involves interpretation (Lacey, 1996:135). Historically, it was Schleiermacher who expanded hermeneutics from a biblical enterprise to a universal discipline concerning understanding, with a particularly important place in Philosophy (Makkreel, 2009:529).

The interpretation of texts is fundamental within historical reconstructivism in relating the text to contemporary problems. However, for a text to be interpreted as a product of the period within which it was originally written, interpreters must technically interpret in accord with other historical documents from the text's period (Makkreel, 2009:531). The role of the interpreter must thence be acknowledged as a co-creator of the meaning of the text (2009:531). Such was the view of Boeckh and Dilthey (Makkreel, 2009:532).

Gadamer's hermeneutics offers a warning for interpretation: the prejudiced nature of meaning's development, in terms of a text's genesis and interpretation must be always remembered (Makkreel, 2009:536). Readers should be aware of their own prejudices as they engage with a text: the generated meaning is influenced by the theory-laden interpretation of the interpreter, the position of the author, and the like (Audi, 1999:378). Interpretation exists upon interpretation. The interpreter of a text, therefore, finds existence within a "hermeneutical circle" of engagements and relationships between prejudiced originators of meanings of any particular texts (Makkreel, 2009:533).

CHAPTER 3:

Thomist-clarified realism: *scientia* of beingⁱ

“... [I]t is necessary to assume for the intelligibility of science that the order discovered in nature exists independently of... human activity in general” (Bhaskar, 1998:21).

3.1. Introduction:

In the preceding chapter it was argued that the Kantian “Copernican Revolution” – in which metaphysical statements were deemed as “transcendental illusions” – inspired the dearth of metaphysics (Kant, [1787]2010:211). Objects, consequently could no longer be known – “in-themselves” – by the subject that is reliant upon sensory experience (Kant, 2010:52-53). The legacy of Kant dramatically impacted Western thought. Hegel, for instance, built upon the Kantian critique of metaphysical speculation although he pushed the separation of subject and object yet further (Longuenesse, 2007:14).¹ For Hegel, the object of study was not even appearance, as in Kant’s case; he deemed thought completely disconnected to any object extra to the thinking subject (2007:11).

“... [Subjective c]onsciousness progresses from the first immediate opposition of itself and the subject matter to absolute knowledge. This path traverses all the forms of the relation of consciousness to the object and its result is the concept of science... [which is] not capable of any other justification than is produced by consciousness as all its shapes dissolve into that concept as into their truth” (Hegel, [1831]2010:28).

Indeed, the Continental philosophical line of the impossibility of metaphysical knowledge continued through to Nietzsche’s rejection of true knowledge of the “thing-in-itself” (Nietzsche, 2005:16). Contemporary Continental philosophy hence faces a vestigial anti-metaphysical quandary. A similar fate has been thrust upon Analytic philosophy in its “linguistic turn” as shown in Carnap (1959:77), the later Wittgenstein (1922:27), and Rorty (1989:4).

¹ “... [M]etaphysics... incurred the just reproach that it employed the pure forms of thought uncritically, without previously investigating whether and how they could be the determinations of the thing-in-itself, to use Kant’s expression” (Hegel, [1831]2010:42).

If – as the positivistically informed post-Kantian philosophers sought to hold – no *Ding an sich* can be known, empirical science is called into question as it is separated from extra-human reality.ⁱⁱ ² Moreover, if real entities are inaccessible, scientific theories – as human constructions – do not copy reality, are not objective, and fall into the constructivist trap of relativism. In this manner, scientific theories become self-contained systems wherein the constructor alone is reflected back to herself.

A negative bias towards the real (“being”) has developed in philosophical circles. Partially because of this heritage philosophy has become distanced from much science, for it would be accurate to assert that most “working scientists” hold that the entities proposed within their theories do exist contrary to the view of some of the philosophers outlined.³ Thus, anti-realist philosophy has – to an extent – become an island of irrelevance to the broader scientific, knowledge economy.

Within this chapter, the problem outlined will be explored from the methodology of historical reconstructivism. It is argued that despite the neglect of being, there exist philosophical frameworks within which current scientific theoretical postulates can be construed as directing to ontological entities. But, this necessitates the facing of that which has been excluded and denied: being (Dillon, 2000:51).

3.2. Being and realism: truth in science or science in truth?

As with other anti-metaphysicians, instrumentalists – concentrating on sensory perceptions – classify the convenient explanations of perceptions as science, rather than placing their focus upon being.⁴ On the other hand, realism – in its crudest form – refers

² We put forward a Popperian conceptualisation of the kind of statements that can be delineated as scientific:

“... [Scientific statements] convey information about the empirical world only if they are capable of clashing with experience; or more precisely, only if they can be systematically tested, that is to say, if they can be subjected... to tests which might result in their refutation” (Popper, [1934]2002:315).

³ “Galaxies, genes and molecules exist... in the straightforward sense in which the mountains and seas of the earth exist... Scientists are likely to treat with incredulity the suggestion that constructs such as these are no more than convenient ways of organizing the data obtained from sophisticated instruments, or that their enduring success ought not lead us to believe that the world actually contains entities corresponding to them” (McMullin, 1984:8).

⁴ Historically, “instrumentalism” was coined by John Dewey (Stanford, 2006:400). It may be defined as:

“View[s] about science according to which theories should be seen as (useful) instruments for the organisation, classification and prediction of observable phenomena” (Psillos, 2007:123).

to any scientific theory proposing that entities exist objectively and independently from human minds (Psillos, 2007:211). The former could hence be classed within the realm of “anti-realist” theories – for it “...dispenses with the things in question...” – choosing alternatively to leave scientific theory on the shallow plane of sensory experience (Lacey, 1996: 286).

Whilst some have sought to eliminate discussion of the realist/anti-realist debate, others have proposed that it continues in the practice of science itself (Fine, 1984a, 1984b, Fuller, 1994:200-201).ⁱⁱⁱ Given the recent CERN findings, with its realist tone, perhaps the debate is not over.

Historically, anti-realist instrumentalism has been present in scientific history since at least the sixteenth century. The preface of Copernicus’ *De revolutionibus orbium coelestium*, written by the German Lutheran theologian, Andreas Osiander is instrumentalist (Popper, 1962:98).⁵ Saint Robert Bellarmine – the Jesuit arbitrator of the infamous “Galileo affair” – was an instrumentalist, too (1962:98).^{iv} As was the Anglo-Irish idealist, George Berkeley (1962:98-99).⁶ The trend continued in Duhem, Mach, and Poincaré (1962:99).^v The common feature is that scientific theories do not provide descriptions of physical reality that correspond to that reality (Stanford, 2006:400). Instead, theories are useful means to explain observations (2006:400).

Consider Galileo’s trial: Galileo’s claim that the earth revolved around the sun could be instrumentally interpreted as an explanation of observed phenomena not as a literal statement of the way things are, as Galileo also admitted (Feldhay, 1995:15, Popper, 1962:110). The earth did not *actually* revolve around the sun.

“It is only the instrumentalist philosopher who asserts that what they discussed, or ‘really meant’ to discuss, were not physical systems but ONLY the results of possible observations; and that their so-called ‘physical systems’, which appeared to be their objects of study, were in reality only instruments for predicting observations” (Popper, 1962:111).

⁵ AD 1498 – 1552.

⁶ Berkeley’s (1685 - 1621) idealist theory was founded in nominalism, for only movements of entities could be observed not their causes (Popper, 1962:109). Thus, the Newtonian theory of gravity, for instance, “... cannot have any informative or descriptive content...” as the theory does not describe events as they actually occur, concluding in nominalism (1962:109).

Science upon this reading is a convenient construction (1962:111). But, if scientific theories are characterised by thorough testing against what is observed, the criterion for testability is the theory in relation with what it describes.⁷ While tentative – as a theory cannot be proved absolutely true – it is possible to determine the false nature of a theory (1962:114-115). Proving a theory false is only possible, however, when the theory meets the real, but for an anti-realist – such as an instrumentalist – this is problematic if not impossible (1962:117).^{vi} Instrumentalist accounts save the theory by bypassing the requirement of accessing the object of scientific study in the theory seeking to describe that entity. Instrumentalists, thus, remain trapped in subjective observation – via sensory perception – rather than accessing being. The being of the thing is ignored, as its existence beyond the subjective perceiver remains unacknowledged.

On the contrary, a realist consideration posits the actual existence of the objects of scientific theories (Leplin, 2006:686). As its first premise, realism “... *asserts the existence of the real world...*”, independent of self-reflectively conscious subjects (Searle, 1999:15).⁸ The nature of the world external to the conscious perceiver is determined by that external reality.⁹ An immediate problem for realism emerges, though: if real objects are independent of perceiving subjects, how do perceiving subjects relate to these objects?¹⁰ Moreover, how is knowledge of these objects obtained?¹¹ This problem is exacerbated by the realist position that the epistemological models created of dimensions of the “world” are independent of the objects themselves in terms of their existence.¹² But, without some association between object and subject, the knowledge held by the subject can never be “true”.¹³

“Knowing... draws out the problem of the relationship between the perceiving subject’s ‘universal’ cognitive constructs and the entities which they represent, a problem returning to the Ancient Greeks” (Scott, 2012:388).

⁷ “It is only in considering how its [science’s] various theories stand up to tests that it can distinguish between better and worse theories and so find a criterion of progress” (Popper, 1962:113).

⁸ “Realism, as the word is used in connection with the mediaeval controversy over universals, is the Platonic doctrine that universals or abstract entities have being independently of the mind; the mind may discover them but cannot create them” (Quine, 1948/1949:33).

⁹ Khlentzos, 2011.

¹⁰ Khlentzos, 2011.

¹¹ Khlentzos, 2011.

¹² Dumontier & Hoehndorf, 2010.

¹³ Khlentzos, 2011.

The existence and discovery of universals, as held by realists, is the particular task of scientific inquiry (Teichmann, 1989:143, Smith & Ceusters, 2010:1). Historically, universals were pointed to by Plato in the *Timaeus*, conceptualising universals as the content of knowledge, transcendent of human experience (Scott, 2012:388).¹⁴ Aristotle later inverted this mystical vision, replacing universals within human sensory experience of the phenomena under investigation.¹⁵ In the *Posterior Analytics*, for instance, Aristotle argued that universals “*inhere*” in every object within which the universal can be identified (Book II, Part 14).

In the Middle Ages, realism only emerged as a distinct position when Scholastic philosophers questioned the natural or cognitive construction of concepts.¹⁶ Philosophers who held that universals were real entities were labelled as “realists”, whilst those who saw them as mental constructs were called “nominalists”.¹⁷ In the work of the French Scholastic Peter Abelard, a middle point between realism and nominalism came to be found, which prepared the way for Saint Thomas Aquinas’ realism.¹⁸ ¹⁹ In the fourteenth century, William of Ockham moved from the moderate Thomist approach towards nominalism.²⁰ ²¹

¹⁴ “... [T]he universal nature... receives all bodies – that must be always called the same; for, while receiving all things, she never departs at all from her own nature, and never in any way, or at any time, assumes a form like that of any of the things which enter into her... But the forms which enter into and go out of her are the likenesses of real existence modelled after their patterns in a wonderful and inexplicable manner...” (Plato, 2009:131).

¹⁵ De Wulf, 1911.

¹⁶ De Wulf, 1911.

¹⁷ De Wulf, 1911.

¹⁸ De Wulf, 1911.

¹⁹ “... [Truth] is defined by the conformity of intellect and thing; and hence to know this conformity is to know truth. But in no way can sense know this. For although sight has the likeness of a visible thing, yet it does not know the comparison which exists between the thing seen and that which itself apprehends concerning it. But the intellect can know its own conformity with the intelligible thing; yet it does not apprehend it by knowing a thing ‘what a thing is’. When, however, it judges that a thing corresponds to the form which it apprehends about that thing, then first it knows and expresses truth” (Aquinas, *Summa Theologica*, I, Q. 16. A. 2).

²⁰ De Wulf, 1911.

²¹ “... I do hold this, that no universal, unless perhaps it is universal by a voluntary agreement, is something existing outside the soul in any way, but all that which is of its nature universally predicable of many is in the mind either subjectively or objectively, and that no universal is of the essence or quiddity of any given substance...” (William of Ockham, *Ordinatio*, 1987:15).

As philosophical history progressed, the nominalist form of anti-realism was sustained (De Wulf, 1911, Psillos, 2007:164). John Locke proposed, for instance, that particular entities are made universal by the mind (1836:93).²² Hume carried on the tradition, arguing (from a particular instance of a thing):

“Let any man try to conceive a triangle in general, which is neither Isosceles nor Scalenum, nor has any particular length or proportion of sides; and he will soon perceive the absurdity of all the scholastic notions with regard to abstraction and general ideas” (1993:106).

Building upon anti-realism, Modernity placed the thinking subject at the centre of understanding, relocating metaphysics to the periphery, so resulting in a vast revision from the Greek and Scholastic traditions (John Paul II, 2002:11). Hence, subjectivism has emerged through modernity into the current philosophical period, negating the essential philosophical problem, that of Being (Heidegger, 1962:21, Scott, 2012:390).

In acknowledging theoretical – in some instances, unobservable – postulates as real entities, realism inverts the anti-realist path begun with nominalism, directly pushing claims to knowledge towards ontology, declaring the being to which the content of hypotheses direct (Leplin, 2006:686).²³ But, realism does not necessarily need to relate to epistemological considerations generally, nor any particular theory of truth particularly.²⁴ Instead, it is an acknowledgement of being extra to the thinking subject, which may or may not be graspable by that subject.

“Realism does not say how things are but only [that] there is a way that they are” (Searle, 1995:155).

Still, an ontological system “truthfully” represented within epistemic forms brings realism into the realm of epistemology. Herein lies the relation between the correspondence theory of truth and realism (Leplin, 2006:686). A theory can successfully describe the real only because it conforms to that which is beyond subjective construction, i.e. to that which it refers (2006:686). Through a realist paradigm, the universal entities of the paradigm “bump up” against the constructs of the theory that attempts to describe these mind-independent dimensions of the real (Popper, 1962:117). Thus, for the realist,

²² 1632 - 1704.

²³ “Metaphysical realism” “... says something about the ultimate nature of things that exist in the world” (Khrentzos, 2011).

²⁴ Dumontier & Hoehndorf explain that the “correspondence theory of truth” whilst oftentimes linked to realism, is not identical to realism (2010).

“... [A] statement is true if things in the world are the way the statement says they are, and false otherwise, is called ‘the correspondence theory of truth’... [S]tatements are true if they correspond to, or describe, or fit, how things really are in the world, and false if they do not” (Searle, 1999:15).

Upon its epistemic components, Hilary Putnam severely challenged metaphysical realism as propagating a “*God’s Eye point of view*” (1981:49).²⁵ Putnam followed the empiricist-line of Locke and Hume, whereby a deep scepticism of the un-empirically observable was advanced (McMullin, 1984:19). If a metaphysical perspective is reduced to one of empiricism, whereby “... *every admissible entity must be directly certifiable by sense experience...*”, then it would be logical to reject that of metaphysical realism (1984:19). It is true that the subject cannot hold a “*God’s Eye point of view*”, for given the magnitude of material reality it is impossible to know the being of all that is (Putnam, 1981:49). But, perhaps in his reduction of a metaphysical and epistemological theory to only empirical concerns, Putnam – and those of the sceptical tradition – have in fact missed the point!

The proposal is not that the subject hold a “*God’s Eye point of view*”. Rather, it is that credence be given to the metaphysical possibility that beyond the subject there is a reality not constructed by the subject. The possibility is hence proposed that there is more than just the subjective perceiver who is but one component of the whole. Indeed, it is not the content of the claim but that there is the claim that is significant (Searle, 1995:155).

In an absolutist form, however, the metaphysical claims of the realist are naïve. Every metaphysical claim *must* be held as tentative especially if scientific theories are involved in the development of these positions.²⁶ The temporary nature of scientific theories needs to be considered by realists. Essentialist or absolutist theories are untenable. If realism posits the truth of a claim made as corresponding to being, and that theory develops further, the particular realist theory held is incorrect and naïve. Realism must hence always be qualified to include science’s developmental and falsificationist character

²⁵ “*On this perspective, the world consists of some fixed totality of mind-independent objects. There is exactly one true and complete description of ‘the way the world is’. Truth involves some sort of correspondence between words or thought-signs and external things and sets of things. I shall call this perspective the externalist perspective, because its favourite point of view is a God’s Eye point of view... There is no God’s Eye point of view that we can know or usefully imagine; there are only the various points of view of actual persons reflecting various interests and purposes that their descriptions and theories subserve” (Putnam, 1981:49-50).*

²⁶ “... [T]he instability of scientific concepts became a problem with which the realist had to wrestle” (McMullin, 1984:9).

(McMullin, 1984:17).²⁷ The very fact of the temporariness of knowledge claims – evidenced by the historically changing nature of scientific theories – should caution the ontologist to the tentativity of her contentions (1984:18).

Out of the agenda of “working scientists”, a particular form of metaphysical realism has emerged: “scientific realism” (1984:8).²⁸ The task of the scientist is to empirically explore real entities through models by means of which discoveries of “the way the world is”, can be made (1984:9).²⁹ ³⁰ While metaphysical realism purports the existence of real universals, scientific realism specifies the manner in which these universals are accessible to the subject, through scientific theories that *roughly* copy the said reality (Smith & Ceusters, 2010:2). The epistemic focus of scientific realism³¹, however, is no easy task, given that there are areas of the “world” which cannot be explored as they exist upon multiple planes.³²

Undergirding scientific realism are a number of informing positions, founded in metaphysical realism. For the scientific realist, the extra-human reality is objective, comprises universals and is independent of the constructs of the thinking subject.³³ The peculiar task of scientific activity is to discover these universals, which exist objectively.³⁴ As such, true theoretical constructs in scientific discourse relate to the entities they model (Boyd, 2009:586). Because scientific realists hold that scientific methodology provides access to reality for the scientist, the theoretical constructs purported by scientists can

²⁷ “Theoretical entities that are needed to explain or predict empirical results, and that are posited by well-supported theories free of empirical or conceptual difficulties, exist and have those of the properties these theories attribute to them that enable them to fulfil their explanatory and predictive roles” (Leplin, 2006:688).

²⁸ Espinoza (1994) and Sankey (2004) argue that “scientific realism” is a qualified form of metaphysical realism:

“The scientific realist’s commitment to mind-independent reality qualifies scientific realism as a form of metaphysical realism” (Sankey, 2004).

²⁹ Dumontier & Hoehndorf, 2010.

³⁰ “According to scientific realism... scientific inquiry leads to knowledge of the truth about observable and unobservable aspects of a mind-independent, objective reality” (Sankey, 2004).

³¹ Scientific realism, as a realist approach is essentially ontological, however, it tends towards epistemology (Espinoza, 1994).

³² “Reality... is hard to investigate due to intrinsic scholasticity in addition to unknown, inaccessible, and multiple levels of complexity. To reduce this complexity, contemporary scientists develop tractable experimental or computational models of reality that provide a slightly more controlled environment in which experiments may be carried” (Dumontier & Hoehndorf, 2010).

³³ Sankey, 2004.

³⁴ Sankey, 2004.

be “... *confirmed as approximately true by ordinary scientific evidence...*” (Sankey, 2004, Boyd, 2009:586-587).

At its heart, scientific realism justifies the scientific method in holding that as science develops over time, it reveals an ever-increasing *representation* of the way reality is (McMullin, 1984:26). This is, however, not a superficial acceptance of the constructs of scientific theories, for these theoretical representations are imaged as always generated from out of the particular human worldview.³⁵ The faith placed in the scientific method by its realists is heavily qualified in accordance with the successful explanations particular theories offer over extended periods of time (McMullin, 1984:26). Hence, scientific realists do not hastily latch onto proposed constructs without adequate exploration of their high certain existence. As a point of fact, there are stringent criteria in place that enable realists to comfortably propose the existence of real universals (McMullin, 1984:26).^{vii}

But, the greatest support for a scientific realist approach within philosophy of science emerges from scientific practice’s exposition of the structure of dimensions of material reality throughout scientific history (1984:26). McMullin cites both geological and biological findings in support of the unearthing of “*hidden structure*” wherein the “discoveries” have demonstrated the evolutionary nature of science (1984:26-28). For example, scientists have been able to increasingly and more complexly conceptualise the cell (1982:28).³⁶ As the biological theories pertaining to the cell progressed, they unearthed greater information about the cell itself such that a more complete representation could be made in scientific discourse (1984:28). The process of theory development within scientific history informed by structure – supported by McMullin’s biological example – is a characteristic of science, wherein there is largely continuity in the evolution of theories (1984:29). In this process, the working scientist “... *faces the question of what is ‘real’...*” by seeking structure.³⁷ However, the scientist needs to question where the limits between real structures and cognitive projections onto the real lie.³⁸ So, while there may be structure in the world, how much of it is real and how much of it is constructed from within scientific theories?³⁹ If scientific theories partially provide

³⁵ Sankey, 2004.

³⁶ “*The chromosome first appeared under a microscope; only gradually was the gene, the theoretical unit of hereditary transmission, linked to it. Later the gene came to be associated with a particular locus on the chromosome*” (McMullin, 1984:28).

³⁷ Sider, 2009.

³⁸ Sider, 2009.

³⁹ Sider, 2009.

the lens onto the real for any subject, it is arguable that certainty of the real remains ungraspable.

The belief in ontological entities as construed from within scientific theories involves a leap of faith in an acceptance of what is purported.⁴⁰ This may appear naïve to some anti-realists. Nevertheless, Quine strengthened the case by providing criterion for the acceptance of real entities: we should accept as real entities those which are postulated by our most robust theories.⁴¹

“... [W]e adopt, at least insofar as we are reasonable, the simplest conceptual scheme into which the disordered fragments of raw experience can be fitted and arranged. Our ontology is determined once we have fixed upon the over-all conceptual scheme which is to accommodate science in the broadest sense...” (Quine, 1948/1949:35-36).

Within scientific theories, metaphysical assertions regarding real entities explored are asserted as real. But, it is the experience of the real in “... *the disordered fragments of raw experience...*”, that colour the ontological position held by the working scientist in his/her theoretical framework (Quine, 1948:36). All scientific theories seek to quantify the entities to which they point as ontological entities – the entities which initiate the scientific research – their existence of which validate the scientific method.⁴² Whilst scientists could be viewed as arrogantly and naively embracing a realist position through their quantification of underlying structures, herein is an assertion – founded in its success – of the confidence scientists place in their method of modelling ontological entities (McMullin, 1984:29).

Rejecting realism because it hints of ontological implications suggests a refusal by anti-realists to face existence, perhaps because of the complexity of ontology, such as the problem of being itself.⁴³ Science’s fertile nature, though, in its continual discovery of natural and physical structures flies in the face of anti-realism (McMullin, 1984:33). That science is capable of success in its explanations cannot merely be pure coincidence on such a massive scale across so many diverse scientific disciplines (1984:33).

⁴⁰ Sider, 2009.

⁴¹ Sider, 2009.

⁴² Sider, 2009.

⁴³ Sider, 2009.

“What best explains it [the success of science] is the supposition that the model approximates sufficiently well the structures of the world that are causally responsible for the phenomena to be explained to make it profitable for the scientist to take the model’s metaphoric extensions seriously” (1984:33).

As already argued, however, realism does not necessitate guileless acceptance of scientific theories or their theoretical components, especially given the evolutionary model of science offered by realists.⁴⁴ Indeed, to hold a scientific theory is not to assert that it is absolutely and essentially true. Rather, it is proposed that the theory is a best-approximation of ontological entities as known at a particular moment and that it is part of an ever-growing narrative attempting to model the way things are (1984:35).⁴⁵

Whilst the metaphysical claim that there is a reality independent of the perceiving subject is asserted by metaphysical realism, the more limited scientific realism makes a stronger epistemological claim. Herein, scientific postulates partially contain best approximations at particular junctures of the ontological entities eluded to. In both forms of realism, however, the metaphysical – i.e. that there is an objective, mind-independent reality that is knowable and experientiable by those who form part of it – must always be primary. The problem of being remains the central concern of all attempts at understanding.⁴⁶

A clarified form of realism is apparent in scientists who are aware that as their theories develop and better explain problems, their image of the real alters and develops. The “real” of a theory is advanced, complexified and graded as time passes. For example, while the theoretical framework employed to explain the discovery of the Higgs boson may become more sophisticated, the limited knowledge of being held at a particular moment partially explains a dimension of the real, albeit credulously. No scientist should, thus, naively declare that a particular theory’s model of reality is absolute.

Amidst the counter arguments against realism, we find the empiricist tradition, which contends that any number of possible accounts of unobservable phenomena could be proposed as true accounts of the said phenomena over and against any one particular

⁴⁴ *“To suppose that theory is literally true would imply, among other things, that no further anomaly could, in principle, arise from any quarter in regard to it” (McMullin, 1984:35).*

⁴⁵ *“... [O]ne accepts an explanation as the best one available; one accepts a theory as a good basis for further research, and so forth. In no case would it be correct to say that acceptance of a theory entails belief in its truth” (McMullin, 1984:35).*

⁴⁶ Espinoza, 1994.

theory (Boyd, 2009:587).⁴⁷ In the case of unobservable entities, empirical evidence cannot be employed to determine which of any of these are true (2009:587). This is because the truth value of theoretical – unlike observational – proposals is not ascertainable as the reality against which the claim is to be measured is not immediately available to the working scientist (2009:587). However, the testing of a theory can be done through the use of confirmed auxiliary hypotheses (2009:590).⁴⁸ Here is the challenge to the empiricist verifiability principle (2009:590).

Within the constructivist framework, science is extraordinarily theory laden: the determination of science, of data employed, analysis, etc., are all products of theory about science (2009:591). Indeed, the object of scientific study is the construction of scientists rather than existing as mind-independent reality, as for constructivists access to a mind-independent reality is determined by the scientist's categories of understanding (2009:591). Moreover, the model generated by the scientist is a scientist's image of the perceived. If this is the case, the realist contention of having access to mind-independent reality is farcical. Hence, realism should be abandoned. Earlier discussions of "language games" may have relevance in this regard, however. For any particular language to exist implies that it exists within a context. That a particular perception of the context is held does not negate that the context itself is! Nor does the problem of being – so central to realism – dissipate.

Realism's allegiance to objectivism results in its assertion of "mind-independence", simply put that the "world" is not determined by the whims of the subject (Jenkins, 2010:883).⁴⁹ Chalmers, however, is particularly critical of the association developed between objectivity and mind-independence, arguing that the latter is a fuzzy concept.⁵⁰ From Chalmers' perspective, objectivity can be embraced without mind-independence, when objectivity is not defined in terms of "assessor-relativism" (Jenkins, 2010:883). The latter term refers to the theory that the truth of ontological entities arises only in relation

⁴⁷ Here we take note that realism asserts the existence of observable as well as unobservable phenomena which form part of mind-independent, objective reality.

⁴⁸ "... [T]wo different theories might be empirically equivalent – they might have the same consequences about observable phenomena – but it might be easy to design a crucial experiment for deciding between the theories if one could find a suitable set of auxiliary hypotheses such that when they were brought into play as additional premises, the theories (so expanded) were no longer empirically equivalent" (Boyd, 2009:590).

⁴⁹ In this sense, objectivity asserts "... that every paradigmatic ontological existence assertion has an objective and determinate truth-value" (Chalmers, 2009).

⁵⁰ Chalmers, 2009.

to context (2010:883). Here, then, realism is understood as anti-relativism, whereby the relation to a subject is removed from the determining of truth-value (2010:883). Indeed, given the emphasis that realism places upon ontology, the essentialist approach is bound to have some sympathisers.⁵¹

Realism is more plausible than anti-realisms – like instrumentalism – in its sympathetic stance to the findings of physical and natural science.⁵² Because realist theories point to the ontology of entities, the primacy of being is taken seriously through being's acknowledgement as real, despite the fact that many posited entities are imperceptible (e.g. subatomic particles, waves, etc.) (Psillos 1999:xvii). Implicit is a meeting between ontology and epistemology in being encountering theory and theory encountering being (1999:xix).⁵³ It is the real which realism emphasises over what can be known – the epistemic – to which the theoretical framework gives greater prominence.

But, as the instrumentalist – or another variety of anti-realist may argue – what guarantee is there that entities theoretically construed conform to the way things are?⁵⁴ The realist supposition of its own epistemic truthfulness brutishly begs the question! (Psillos, 2009:xxiii). If a phenomenon is real, the theory that explains it needs to correspond to that entity (Psillos, 2009:46). But how can we be sure of this?

⁵¹ *"The positive argument for realism is that it is the only philosophy that doesn't make the success of science a miracle"* (Putnam, 1975:73).

⁵² *"... [T]his conception of the enterprise of science provides the only plausible explanation of the instrumental reliability of the scientific method... [T]he reliability of theory-dependent judgments of projectability and degrees of confirmation can only be satisfactorily explained on the assumption that the theoretical claims embodied in the background theories which determine those judgments are relevantly approximately true, and that scientific methodology acts dialectically so as to produce in the long run an increasingly accurate theoretical picture of the world... The instrumental reliability of particular scientific theories cannot be an artefact of the social construction of reality"* (Boyd, 2009:596).

⁵³ *"... [M]ature and predictively successful scientific theories [are imaged] as well confirmed and approximately true of the world. So, the entities posited by them, or... entities very similar to those posited, do inhabit the world"* (Psillos, 2009:xix).

⁵⁴ Feigl defined "the real" as:

"... [T]hat which is located in space-time and which is a link in the chains of causal relations. It is thus contrasted with the illusory, the fictitious and the purely conceptual. The reality, in this sense, of rocks and trees, of stars and atoms, of radiations and forces, of human minds and social groups, of historical events and economic processes, is capable of empirical test" (1949:16).

“Because the epistemic access account of reference can explain the grains of truth in the other theories of reference for theoretical terms which have been advanced to explain the actual judgment of scientists and historians about issues of univocality, there is every reason to believe that the epistemic access account can explain why the ordinary standards for judging univocality that prevail in science are reliable indicators of actual coreferentiality. Together with the realist’s conception that scientific methodology produces (typically and over time) approximately true beliefs about theoretical entities, the epistemic access account of reference provides an explanation of how univocality judgments contribute to the reliability of scientific methodology, an explanation that is fully in accord with the general realist conception of scientific methodology described here” (Boyd, 2009:598).

Science’s success at explaining reality provides grounds for realism’s support.^{55 56} The “*no miracle argument*” for scientific realism – proposed by Putnam – suggests that science is successful because its theories point to that which exists (Putnam, 1975:73, Psillos, 1999:70). This plainly circular argument could negate realism, however (Fine, 1986:161).⁵⁷ Opposing the realist position of “belief” in entities’ existence by virtue of scientific theory’s success, instrumentalists do not declare grounds for belief, but rather why one could utilise a particular scientific theory through avoiding fallacious reasoning (1986:161).

A further charge against realism is science’s tentative nature, implying the entities to which scientific theories point are not approximately accurate descriptions of being (Psillos, 1999:xxiii). Contrary to instrumentalism, however, all varieties of realism contain, as already proposed, both epistemological and ontological components in asserting the existence of “*physical systems*” rather than solely sensory mediated observations of which the theory generated is an explanation (Popper, 1962:111). Were realism to remain within an epistemological framework without transcending the subject, the circular critique would be justified. What is “known” as articulated in a theory could be falsified readily by a counter-theory. However, in realism’s ontological commitment, the entities directed to via theory must always remain. Hence, if theoretical constructions are falsified

⁵⁵ “*That terms in mature scientific theories typically refer... that the theories accepted in a mature science are typically approximately true, that the same terms can refer to the same even when they occur in different theories – these statements are viewed not as necessary truths but as part of the only scientific explanation of the success of science, and hence as part of any adequate description of science and its relations to objects*” (Putnam, 1975:73).

⁵⁶ “... [N]o empiricist or constructivist account of the methods of science can explain the phenomenon of instrumental knowledge in science...” (Boyd, 2009:598).

⁵⁷ “... [T]he realist... must not offer as grounds for belief in realism its role in successful explanatory stories, on pain of begging the question... [I]n so far as realism might function in successful explanations of scientific practice, that success would give us grounds for believing in realism’s central theoretical entities – correspondence, or real-World reference...” (Fine, 1986:161).

or changed due to the emergence of contrary evidence, the realist is beholden to alter the theory to face being, maintaining being as essential to the scientific enterprise.⁵⁸

An unsophisticated realism – holding that theories absolutely copy physical reality – is untenable and indefensible. Certainly the human subjectivity involved in the creation of scientific theories would have to be completely removed. An impossibility! Errors in measurement, background, worldviews, predictions, estimates, etc., are part of science (Psillos, 1999:276). Science should realistically seek “*approximate fittingness*”, such that theories are “*truth-like*”: theories should conform to reality to some degree (1999:276-277).⁵⁹ The assertion of independent reality – and theories conforming to that reality – should not be forsaken (1999:277). Scientists, through theories, must approximate reality so these will continue to successfully describe reality, though place always remains in the scientific method for falsification and progress towards ever fuller explanations of reality (1999:277).⁶⁰

Realist science’s ontological and epistemological dimensions hold an oxymoronic nature, but admission of this innate duality contributes towards countering the circularity critique previously offered against realism. A clarified realism should embrace the dual-fold nature of science wherein subject and object symbiotically develop the scientific undertaking.⁶¹

Scientific knowledge is the product of a subject. But, it is also the purpose of science to theorise *about* actual objects separate from the scientific subject (Bhaskar, [1978]2008:17). Philosophy of science must hold in balance the subjective (as a human social activity) and the objective (the being of real entities), without either of which science

⁵⁸ “*The truth of a statement consists in its representation of something external, in its holding up a mirror to the world...*” (Wright, 1992:83).

⁵⁹ “*According to the distinctly realist account of scientific knowledge, the reliability of the scientific method as a guide to (approximate) truth is to be explained only on the assumption that the theoretical tradition that defines our actual methodological principles reflects an approximately true account of the natural world. On that assumption, scientific methods will lead to successively more accurate theories and to successively more reliable methodological practices*” (Boyd, 2009:599).

⁶⁰ “*A description D approximately fits a state (i.e. D is approximately true of S) if there is another state S’ such that S and S’ are linked by specific conditions of approximation, and D fits S’ (D is true of S’)*” (Psillos, 2009:277).

⁶¹ “*... [M]en [sic] in their social activity produce knowledge which is a social product much like any other, which no more independent of its production and the men who produce it than motor cars, armchairs or books... This is one side of ‘knowledge’. The other is that knowledge is ‘of things which are not produced by men at all: the specific gravity of mercury, the process of electrolysis... None of these ‘objects of knowledge’ depend upon human activity*” (Bhaskar, 1998:16).

would not occur (Bhaskar, 1998:18).⁶² It is thus unacceptable for scientific meta-theorising to remain within either objective ontology or subjective epistemology. That said, without its having an object as primary, the observations and musings of the scientific subject concern nothing. Shared experiences of scientific subjects point beyond “fitting” solipsistic observations and ruminations.⁶³

In an intricate interplay, to be a *statement of being* requires reference to scientific theory (to reliably ascertain the content of being), but to *become a scientific theory*, reference to being must be made (1998:23). The process of *ontological*, scientific theory-development is complex and interconnected. The problem, though, is how certainty of ontological knowledge – as suggested by realist theory – can be ascertained. No clear answer has yet been argued for.

Placing the situation within the context of Modernity may assist. Much of the problem faced in Modern philosophy arises from the “epistemic fallacy”: the reduction of ontology to epistemology, wherein *knowledge of being* is considered rather than *being-itself* (Bhaskar, [1978]2008:16), 1998:27). Hence, the subject is placed as a step removed from being (1998:27-28). This fallacy was committed by Kant when he theorised that the categories of understanding can only be related to the sensible (1998:28). The Positivist tradition also collapsed being into epistemology in its negation of the unempirical (1998:28). The epistemic fallacy increases the distance between subject and thing, by projecting epistemological categories onto being, limiting the possibility of the fuller apprehension of being by the subject (1998:28). The fallacy is anthropocentrically arrogant: it reduces reality to human reasoning alone, dissipating ontology (1998:33). Being is, though, not limited to categories of understanding. Reality does not cease without knowledge of it, for “... *to be is not to be the value of a variable...*” (1998:29). Scientific knowledge is possible only because *being precedes knowing*, as knowing is knowledge of something and reality is structured in a manner that is knowable (1998:29).⁶⁴

⁶² “... [I]t is not the fact that science occurs that gives the world a structure such that it can be known by men [sic]. Rather, it is the fact that the world has such a structure that makes science, whether or not it actually occurs, possible” (Bhaskar, 1998:23).

⁶³ “For Kepler [as an example] to see the rim of the earth drop away, while Tycho Brahe watches the sun rise, we must suppose that there is something that they both see (in different ways)” (Bhaskar, 1998:24).

⁶⁴ “Knowledge follows from existence, in logic and in time; and any philosophical position which explicitly or implicitly denies this has got things upside down” (Bhaskar, 1998:29).

Nevertheless, the content of *thoughts about reality* and *reality-in-itself* are not mutually inclusive: understandings of objects are mental constructs of objects developed through perception and cognition (Bhaskar, [1978]2008:250). In this distinction, the changing nature of scientific theories is reconciled with being ([1978]2008:248). If the theory is a cognate entity, it is a partial description of being and not being apart from the theoretical construct in terms of its existence ([1978]2008:248). But, for a theory to be true it must correspond with being ([1978]2008:249). In this sense, good scientific theories approach truth in their drawing together of ontology and epistemology rather than holding truth in any absolute sense. Still, scientific theories – in their constructors – *must* face being in order to make a truth-approximation, for otherwise the truth-claim is merely a cognitive construction unrelated to ontology.

Within Modernity the said distance between ontology and epistemology was a consequence of the separation of the thing in itself and the perceived object.⁶⁵ Being, both in general (i.e. the “problem of being”) and in particular terms (of the thing in question) came to be placed after the object, which is always conceived *in relation* to the subject (Maritain, 1995:97). From the work of Descartes, ontology could be reasoned from epistemology, since knowing determined being rather than the prior Scholastic understanding that being determined knowing (Gilson, 2011:12-13).⁶⁶ The scientific theory, visualised in post-Cartesian thought, is always a construction of the mind, rather than a directing mechanism of the subject towards being. The thing is ungraspable in-itself, for it exists only as a mental construction.⁶⁷ Analogously, Noël explains:

“If you have a hook painted on a wall, the only thing you will ever be able to hang from it is a chain also painted on the wall” (Noël in Gilson, 2011:14).

The representation of the thing is never the thing, though it is the object of consideration by the theoretical construction. But, if objects are cognitive constructions by subjects, how are the relations between things-in-themselves to be explained? (Maritain, 1995:98) A solution is reclaiming the thing – being *qua* being – a task in conflict with post-Cartesian and Kantian philosophy in Modernity’s turn to the subject (Maritain, 1995:1, 3, 99,

⁶⁵ “... [T]he thing became a problematical ‘lining’ concealed behind the object” (Maritain, 1995:97).

⁶⁶ “With Descartes the Cogito ergo sum [I think, therefore I am] turns into Cogito ergo res sunt [I think, therefore things are]” (Gilson, 2011:13).

⁶⁷ “From the duplicate or image there is no way of reaching the thing itself. Once trapped in immanence, the duplicate is only a mental symbol and will remain such” (Noël in Gilson, 2011:14).

McInerny in Maritain, 1995:xix-xx).^{68 69} In more epistemic versions of realism, such as in scientific realism, it is contended that being is not faced adequately by remaining within reflection on the object as opposed to the thing.

“Philosophical reflection has to affirm that the thing is given with and by the object, and that it is even absurd to wish to separate them. On this point, a truly critical critique of knowledge, a critique that is fully faithful to the immediate data of reflexive intuition, is in accord with common sense in providing an apology for the thing” (Maritain, 1995:99).

Rather than the object and the thing existing separately, from within the Thomist-realist perspective, both the material thing and the formal object are united in the same entity, such that for a statement concerning a thing to be true, the being of the thing must be reflected in the statement (Maritain, 1995:99). If the thing remains constructed as pure object – always in relation to the view of the subject – the epistemological process is bound to gazing into a mirror, never to expose the thing. The thinking subject should always seek to grasp the thing that is not a reflection of the subject’s cognition (1995:105).⁷⁰ Prior to a subject thinking about an object, it is the thing behind the object that has being (1995:106).

3.3. Truth as adequation to being:

Among its chief concerns, Thomism places particular importance on the relationship between thing and subjective perceiver. Out of this familiarity emerges the Thomist correspondence theory of truth, which like other varieties of correspondence has been subject to criticism (Milbank & Pickstock, 2001:xiii).⁷¹ As with the broader Thomist realism,

⁶⁸ “... [W]hile having a taste for the real indeed, they nevertheless have no sense of being. Being as such, loosed from the matter in which it is incorporated, being, with its pure objective necessities and its laws that prove no burden, its restraints which do not bind, its invisible evidence, is for them only a word” (Maritain, 1995:1).

⁶⁹ “True, timeless metaphysics no longer suits the modern intellect. More exactly, the latter no longer squares with the former. Three centuries of empiro-mathematicism have so warped the intellect that it is no longer interested in anything but the invention of apparatus to capture phenomena—conceptual nets that give the mind a certain practical dominion over nature, coupled with a deceptive understanding of it; deceptive, indeed, because its thought is resolved, not in being, but in the sensible itself” (Maritain, 1995:3).

⁷⁰ “... [W]hat does the mind want to scrutinize if not the thing, the transobjective subject in all its ontological wealth, in the infinity of its objectifiable resources?” (Maritain, 1995:105).

⁷¹ The second chapter of this work enunciated the problematic between subject and object and so it will not be repeated. It will suffice to mention that in correspondence theories of truth, the claim to truth is a result of the corresponding relationship between the object under scrutiny and the thinking subject. The thinking subject is able to cognitively form a representation which accurately images the object. The

the correspondence theory of truth is somewhat distinct from other forms (2001:xiii). Most conceptual articulations of realism and of correspondence concern themselves with the epistemological manner in which the subject gains access to the object (Gilson, 2011:18). However, the Thomist definition transcends this problematic. Put forward here is “... a doctrine in which the real existence of the object [being] is taken for granted...” without the subject’s direct involvement for the being of the thing (2011:18). The thing – it is contended – is left alone, to be, without subjective projection upon the thing/object.

Within Aristotelian-Thomism, “being” has a dual-fold nature.⁷² Being is anything that can be categorised as “thing” (ontological) (Aquinas, 1993:91). In the second sense, being is epistemological in that it is “... whatever makes a proposition to be true” (Aquinas, 1993:92). Being is hence concerned with both what is and with truth.⁷³

The theoretical approach to truth within Thomism, though (as noted), differs from other correspondence theories of truth, for herein is not merely a docile, naïve re-presenting of the object to the subject making statements concerning the object true (Milbank & Pickstock, 2001:5). Truth relates directly to the being of the thing by its claiming that the ontology of the thing is accessible (2001:5). In this manner, truth can be reclaimed in post-Modernity (2001:xiii).

“This perspective ensures that truth does not simply reduce to our mode of apprehension of what is the case, as is bound to occur on the epistemological model for which the intellect is accorded no necessary ontological dignity, but is merely supposed to mirror a reality itself indifferent to being comprehended” (Milbank & Pickstock, 2001:xiii).

Aquinas’ correspondence realism can be conceived as of a moderate variety, for within it is a meeting between universals and the perceiver, between thing and subject (Scott, 2012:388).

“... [Truth] is defined by the conformity of intellect and thing; and hence to know this conformity is to know truth. But in no way can sense know this. For although sight has the likeness of a visible thing, yet it does not know the comparison which exists between the thing seen and that which itself apprehends concerning it. But the intellect can know its own conformity with the intelligible thing; yet it does not apprehend it by knowing of a thing

nature of such truth-theories is epistemological. The error of sensory perception and the problem of ascertaining knowledge of the extra-subjective, thus arise.

⁷² Saint Thomas Aquinas, *Commentary on Aristotle’s Physics*, 3.3 (202a22-202b29).

⁷³ “... [B]eing also is in things and in the intellect...” (Aquinas, *Summa Theologica*, I, Q. 16, A. 3).

*‘what a thing is.’ When, however, it judges that a thing corresponds to the form which it apprehends about that thing, then first it knows and expresses truth” (Aquinas, *Summa Theologica*, I, Q. 1, A. 2).*

To be, a thing has this-ness – something of which it is like for that thing to be – expressed as being (1993:92). It is only because a thing has *this-ness* that it can “... *act and be acted on...*”, that is, that it provides a source for understanding as thought always seeks to clutch the thing (Aquinas, 1993:30, Gilson, 2011:19). Being and Truth – defined in this combinatory sense – are not conceived as separate entities:

*“The truth resides in things and in the intellect... But, the truth that is in things is convertible with being as to substance; while the true that is in the intellect is convertible with being, as the manifestation with the manifested...” (Aquinas, *Summa Theologica*, I, Q. 16, A. 3).*

Both being and Truth are found in the thing and the intellect – from whence arises the correspondence – although being tends towards the thing and truth to the intellect (Aquinas, *Summa Theologica*, I, Q. 16, A. 3). The intertwinedness of the ontological and the epistemological explorations of the thing, therefore, imply that delineation is not easy (Gilson, 2011:25).

In the Kantian critique, the subject’s conceptualising of an object (re-presentation), makes its being indeterminate. It is only possible to proceed toward the object from the subject, never from the thing itself. On the contrary, for the Thomist, one can only have a thought about a thing as a *result* of the thing’s being: thought about a thing must be grounded in something, i.e. that thing (Gilson, 2011:53).⁷⁴ When the intellect apprehends a thing, it is not apprehending itself but a being independent of the subject (2011:55). The first step in the creation of an apprehension is the subject’s engagement with a thing’s being (2011:54). It is therefore not the apprehension of the thing which is primary, but the thing itself *before* the subject (2011:55). The intellect moves in the direction of being prior to apprehension and prior to the cognition of the perceived (2011:56). It would make logical sense, hence, that the instant any faculty more than the sensory is employed, the being of the thing is removed: a representation of the thing – rather than the thing itself – is generated by the subject and apprehended (2011:57).⁷⁵ The real,

⁷⁴ *“The actual situation of the intellect... is that if there were no things, there would be no knowledge...” (Gilson, 2011:53).*

⁷⁵ *“For the material being to be knowable as a thing-in-itself, it must be directly given as a thing-in-itself, and only a sensory faculty can do that. Every attempt to turn the sensory evidence into a rational deduction or induction can only have one result, immediate or mediate, which is to destroy it because it belongs to a different order” (Gilson, 2011:57).*

imaged thus, is “... *the direct grasp of the existence of things in sense perception*”, prior to cognition (2011:58).

Asserting that being is prior places the focus on ontology thus creating a leap to the epistemological component – composed as it is of the sensory and the reflective – that transcends unmediated datum. How is knowledge *actually* obtained about anything that is? How is being faced by the intellect? These are the questions both of the relativist and of the correspondence theorist (Milbank & Pickstock, 2001:6).

For the Thomist realist, the epistemic is clarified: the object of epistemology is not *thinking about* a thing (which may be flawed), “... *but knowledge...*” itself (Gilson, 2011:89).⁷⁶ Knowledge is “*of being*” in the intellect’s conforming to the way things are, for Truth refers to being (Gilson, 2011:90, Milbank & Pickstock, 2001:6). This does not imply that the intellect never misinterprets content (2011:102).^{viii} But, knowledge emerges only when the thinking subject conforms to being (2011:102). There is a unity between thing and knowledge about the thing, but a *partial* disjuncture between this unity and the thought of the subject of the thing (Maritain, 1995:91).⁷⁷ The relation between subject and thing concerns truth (1995:89).

While Aristotle and Augustine both argued that Truth is totally conformable with being, Saint Thomas’ approach was more nuanced (Aquinas, *Truth*, Q. 1, A. 1 [2008a:3]).⁷⁸

“... [I]f Truth is convertible with Being... why do we need to add truth to Being? Why do we give them different names?” (Milbank & Pickstock, 2001:7).

When a statement is declared as true there is an *adequation* (a conformity) between the intellect and the being of the thing (Aquinas, *Truth*, Q. 1, A. 1 [2008a:6]).⁷⁹ Truth only is, when the knowledge held by the subject is the product of a true statement: the statement is adequate to being (Aquinas, *Truth*, Q. 1, A. 1 [2008a:6]). Truth is conformable to being,

⁷⁶ “The way things exist in our thought, so as to be known, is not the same as the way they exist in themselves. (As soon as the mind reflects upon itself it perceives that there is an inside to thought, constituting a world apart, even though it is open to things)” (Maritain, 1995:89).

⁷⁷ Whilst it is tautological, Maritain asserts a statement of common sense:

“... [A] thing cannot be known without being known” (1995:92).

⁷⁸ Aristotle proposed: “[t]he state of a thing in its act of existence is the same as its state in truth”, but for Augustine, “[t]he true is that which is”, and (in Aquinas, 2008a:3-4).

⁷⁹ “The basic ratio of truth is the conformity, correspondentia, conformitas, or equation, adequation, of thing and intellect” (Schultz-Aldrich, 2009:623).

grounded in being, but distinct from being (Aquinas, *Truth*, Q. 1, A. 1 [2008a:6]). Being prepares the way for the possibility of Truth⁸⁰, it emerges when there is rectitude between being and the subject (in the intellect)⁸¹, and in its articulation, it declares what is⁸² (Aquinas, *Truth*, Q. 1, A. 1 [2008a:6-7]).

“The true is a state of being even though it does not add any reality to being or express any special mode of existence. It is rather something that is generally found in every being, although it is not expressed by the word being” (Aquinas, *Truth*, Q. 1, A. 1 [2008a:8]).

Being constrains Truth in its correspondence between the subject and the thing (Aquinas, *Truth*, Q. 1, A. 1 [2008a:8]). This does not mean that Truth is being, however, nor that Truth is contained within being (Aquinas, *Truth*, Q. 1, A. 2 [2008a:10]). Truth is grounded in being, but is founded in the act of adequation between being and intellect, which belongs solely to the activity of the conscious subject (Aquinas, *Truth*, Q. 1, A. 2 [2008a:10]).⁸³ Without conscious subjects, Truth would not exist.⁸⁴ Nevertheless, being would continue to remain as long as anything has existence. Thus, being is a necessary condition for Truth, but Truth is not necessary for being: the former determines the latter, not *vice versa*.^{85 86}

In Truth, however, is not a re-presentation of a thing, but an adequation (Maritain, 1995:93). In this conformity, the being of the thing is pointed to in its declaration by a thinking subject in accord with the manner of being of the thing (Maritain, 1995:93). A direct relation of adequation therefore arises in the thing’s being and in being announced by the subject (1995:94). This is truth, which is simultaneously both of the object and of

⁸⁰ *“The truth of each thing is a property of the act of being which has been established for it”* (Avicenna in Aquinas, 2008a:6).

⁸¹ *“Truth is a rectitude perceptible only by the mind”* (Saint Anselm of Canterbury in Aquinas, 2008a:7).

⁸² *“Truth is that by which that which is, is shown”* (Saint Augustine in Aquinas, 2008a:7).

⁸³ *“A thing is not called true... unless it conforms to an intellect. The true, therefore, is found secondarily in things and primarily in intellect... But if, by an impossible supposition, intellect did not exist and things did not continue to exist, then the essential of truth would in no way remain”* (Aquinas, *Truth*, Q. 1, A. 2 [2008a:11]).

⁸⁴ *“... [F]or Aquinas, truth is less properly in things than in the mind...”* (Milbank & Pickstock, 2001:8).

⁸⁵ *“... [E]very true act of understanding is referred to a being, and every being corresponds to a true act of understanding”* (Aquinas, *Truth*, Q. 1, A. 2 [2008a:12]).

⁸⁶ *“Every being is in this way related to knowledge, but some beings only insofar as they are known...”* (Milbank & Pickstock, 2001:7).

the subject, i.e. both objective and subjective (Maritain, 1995:94, Milbank & Pickstock, 2001:11).⁸⁷

3.4. *Scientia*:

For scientific theories to be true, the same adequation as in true statements – between being and intellect – must be made. This is the very different goal of “*scientia*” in the Aristotelian-Thomist tradition when compared to contemporary definitions of “science” (Stump, 1991:133, Jenkins, 1997:11, Hagedorn, 2012:121).⁸⁸ To understand Aquinas’ conception of “*scientia*”, however, we cannot sever him from Aristotle, as the latter informs the context and approach of the former (Jenkins, 1997:7).

The etymology of the English term “science” emerges from the mediaeval Latin “*scientia*”, which in-turn is from the Greek, “*ἐπιστήμη*”, the subject of Aristotle’s *Posterior Analytics* that has been dubbed a discussion of the method of science (Jenkins, 1997:11, Hagedorn, 2012:121). It is thus to Aristotle’s “*Posterior Analytics*” that we need to turn in order to explore where Saint Thomas was grounded.

In the second part of the *Posterior Analytics*’ first book, Aristotle describes what it is to have “*scientia*” (or “*ἐπιστήμη*”):

“We suppose ourselves to possess unqualified scientific knowledge of a thing... when we think that we know the cause on which the fact depends, as the cause of that fact and no other, and further, that the fact could not be other than it is” (Posterior Analytics, Book I, Part II).

He continues that *scientia*’s object is as it is, and cannot be any other way, is made known by a demonstration in a syllogistic fashion (Aristotle, *Posterior Analytics*, Book I, Part II).⁸⁹ In the syllogistic mode of reasoning, the premises of the argument presented take centre-stage, for they are required to be true (that is, they are required to have existence), primary (they do not require demonstration themselves), and lead to the conclusion’s

⁸⁷ “... [T]ruth is had by referring to the actual or possible existence possessed by the thing: verum sequitur ESSE rerum” (Maritain, 1995:96).

⁸⁸ Stump suggests that “*scientia*” and “knowledge” are not synonymous (1991:133, Williams, 2009:30). Additionally, Jenkins draws out that one should make use of the term “*scientia*” rather than the English “science” as translating the term is misleading to readers given that contemporary conceptions of “science” are not equated to the mediaeval notion of “*scientia*” (1997:17). Likewise, the author will keep to this convention to draw the distinction between the broader “*scientia*” and the narrower “science”.

⁸⁹ “... [T]he objects of science are necessary facts” (Aydede, 1998:15).

cause (of which they are before in time and better known) (Aristotle, *Posterior Analytics*, Book I, Part II). Without further qualification, the premises of the syllogism of a claim towards *scientia* are more distant from sensory perception, for the senses do not perceive universals but only particular instances (Aristotle, *Posterior Analytics*, Book I, Part II).⁹⁰ These components of *scientia* are thus more “basic truths” for they have no propositions to be upheld prior to their own existence (Aristotle, *Posterior Analytics*, Book I, Part II).^{ix} In *scientia* a statement of fundamental dimensions of being is made, and herein we could identify Aristotelian realism: natural realities are demonstrably explainable (Aydede, 1998:15). Moreover, the variety of knowledge held by the subject, becomes one where the perceiver has *true* knowledge, that is, knowledge of being (Aristotle, *Posterior Analytics*, Book I, Part II). This is not a shallow or raw grasp of science:

“... [I]f a man [sic] sets out to acquire the scientific knowledge that comes through demonstration, he must not only have a better knowledge of the basic truths... nothing must be more certain or better known to him than these basic truths... For indeed the conviction of pure science must be unshakable” (Book I, Part II).

The demonstrative syllogism directs to “*scientia simpliciter*” (“ἐπιστήμη ἀτλόζ”/“unqualified science”) (Jenkins, 1997:13). However, the syllogism is only a part of the path: why one believes the conclusion of the syllogism to be true also needs articulation (1997:14). Saint Thomas articulates Aristotle’s position well: *scientia* can only be had when nature becomes better known to the scientist thus grounding the belief held and expressed in the syllogism (Aquinas, *Commentary on the Posterior Analytics of Aristotle*, Book I, Part IV, Jenkins, 1997:15). The syllogism is hence a re-presentation of the aspect of nature sought to be investigated by *scientia*, to the subject.

An assumption is present, though. For in the process of *scientia simpliciter* acquisition in order that a thing be known, “... *previous knowledge of ‘what is’ (quid est)...*” must be had by the subject (Jenkins, 1997:18). That is, the existence of the thing (*quia est* – “that is”) must be had (1997:18). Within the Aristotelian account, without prior knowing of existence, it is impossible to have knowledge of any particular extant entity (Jenkins, 1997:19).

Out of Aquinas’ interpretation of Aristotle it is evident that Aquinas identifies Aristotelian “*scientia simpliciter*” as complete knowledge, “... *which means to apprehend its truth perfectly*” (Aquinas, *Commentary on the Posterior Analytics of Aristotle*, Book I, Part

⁹⁰ “... [O]bjects without qualification prior and better known are those further from sense” (Aristotle, *Posterior Analytics*, Book I, Part II).

IV). If scientific knowledge is to be perfect (certain), the knowledge held in the statement must be of the being of the thing about which the statement concerns (Book I, Part IV). However, in the knowledge accounts of Aristotelian “*scientia simpliciter*” only necessary truths can be strictly included (Jenkins 1997:20-21). Nevertheless, *scientia* can be had in an “imperfect” manner, too (1997:32).

Regardless of the level of perfection, of utter importance is that knowledge must be informed by being and must direct to being, even if only in a limited way for it to be considered as *scientia*, that is, as true (1997:37). In this manner, *scientia* imitates the way reality is (1997:47). Thus, the purpose of any *scientia* of a thing is for the subject to attempt to face what is in its encounter with that particular thing (1997:49).

Establishing itself in Aristotle’s method, Saint Thomas’ theory of *scientia* models that *scientia* is acquired from the sensory beginning point of the subject’s experience of the thing through the employment of demonstrative syllogisms (Williams, 2004:506, Floyd, 2006:1).^x Different to Aristotle, Aquinas gives his epistemology a peculiarly Christian ethos (Williams, 2004:506).

In keeping with the Aristotelian tradition, *scientia* is articulated Thomistically as an organised and reasonable attempt towards access to Truth of being (Williams, 2004:507, Aquinas, *Summa Theologica*, I, Q. 1, A. 8). But, Aquinas does not expound in very great detail upon “*scientia*”, remaining a broad term wherein being is re-presented to the subject (2004:510). This ability arises from the reasoning faculty of the human, originating in the in-born capacity to loom nearer any particular thing via the senses (Williams, 2004:507).⁹¹ Error is not discounted in *scientia* either, since it is a human activity and human reasoning can be less than infallible (Floyd, 2006:2).^{xi} *Scientia* is thus tentative and fragile (Williams, 2009:20).

The delicateness of *scientia* is added to by Aquinas’ claim that there are multiple *scientiae*, “... according to the various means through which knowledge is obtained” (*Summa Theologica*, I, Q. 1, A. 1). Collectively these *scientiae* lead to knowledge of what is, though

⁹¹ “The natural light instilled within us, manifests only certain general principles which are known naturally... The discourse of reason always begins from an understanding and ends at an understanding, because we reason by proceeding from certain understood principles... Hence the act of reasoning proceeds from something previously understood” (Aquinas, *Summa Theologica*, II-II, Q. 8, A. 1).

they may follow different paths to get there (*Summa Theologica*, I, Q.1, A.1).⁹² Aquinas thus asserts a remarkably contemporary position in philosophy of science: multiple *scientiae* can direct toward being (articulated in true statements), both directly (“*in itself*”) or via another truth conceptualised by the intellect (*Summa Theologica*, I-II, Q. 57, A. 2).^{xii}

In the first instance there is *scientia* founded in, as we have already discussed, human reason (*Summa Theologica*, I, Q. 1, A. 2).⁹³ In the second sense, and contrary to his objectors, Saint Thomas asserts that there is the *scientia* of “*sacred doctrine*” (*Summa Theologica*, I, Q. 1, A. 2).⁹⁴ In the Thomistic conceptualisation of subalternated sciences – a hierarchy of sciences whereby the more lowly are founded in the superior – the *scientia* of “*sacred doctrine*” is the subaltern *scientia* of “... *the science of God and the blessed*” (*Summa Theologica*, I, Q. 1, A. 2, Weisheipl, 1974:56).⁹⁵ “Sacred doctrine”, therefore, unlike any other *scientia*, does not proceed through the reason’s “self-evident principles”, but rather through the self-evident principles held by God and the blessed (*Summa Theologica*, I, Q. 1, A. 2).⁹⁶ In this manner, for Saint Thomas, sacred doctrine’s proceeding in subaltern form from more basic principles – God’s own knowledge of God’s self – establishes its nature as *scientia* (*Summa Theologica*, I, Q. 1, A. 2).⁹⁷ However, precisely because of this point, some have countered that sacred doctrine cannot be considered as *scientia* (Jenkins, 1997:161).^{xiii}

It may be argued that the divine basic principles that found the “*scientia*” of sacred doctrine are its downfall as a *scientia*, for these are not demonstrable. However, for Saint Thomas

⁹² “... [T]here is no reason why those things which may be learned from philosophical science, so far as they can be known by natural reason, may not also be taught us by another science...” (Aquinas, *Summa Theologica*, I, Q. 1, A. 1).

⁹³ Among these, Saint Thomas includes the “*science of perspective*” which develops from geometry, or music, which proceeds from arithmetic (*Summa Theologica*, I, Q. 1, A. 2).

⁹⁴ “... [S]acred doctrine is a science because it proceeds from principles established by the light of a higher science, namely, the science of God and the blessed” (Aquinas, *Summa Theologica*, I, Q. 1, A. 2).

⁹⁵ Weisheipl notes that Cajetan considered “sacred doctrine” as referring neither to faith nor theology, for in the first instance, the following articles in the first question of the first part of the *Summa Theologica* do not concern faith, and in the second instance, Saint Thomas would not have put forth that salvation is only possible when faith and theology are in compliment (1974:56). The content of “sacred doctrine” is knowledge specifically that God has of God’s self (Weisheipl, 1974:56).

⁹⁶ For the Thomist, *faith* does not refer to believing in *the existence of God*, instead, the object of faith is God, who is “... *the first truth*...” (Jenkins, 1997:162, cf. *Summa Theologica*, II-II, Q. 1, A. 1). Believing that God exists, for instance, is not an article of faith, but a preamble to having faith whose object is God (Jenkins, 1997:162, cf. *Summa Theologica*, I, Q. 2, A. 2). In order to have the object of God, the subscript required is that God must be.

⁹⁷ “For Thomas, sacred doctrine is ‘science,’ but one that is subalternated to the knowledge (*scientia*) that God has of himself and that the blessed in heaven have of him” (Weisheipl, 1974:56).

this critique is of no consequence.^{xiv} It is not the task of sacred doctrine to prove the articles of faith from which it proceeds, but simply to proceed from them (*Summa Theologica*, I, Q. 1, A. 8, Williams, 2009:37). Faith, as we shall see, is not to be proven.⁹⁸ Arguing via metaphor, Williams explains:

“It is not the job of the draftsman to prove Euclid any more than it is the harpist’s job to prove arithmetical principles. The fact that another science may be able to provide such proofs is irrelevant: the salient point is that a scientia can be based on propositions functioning for its own purposes sheerly as postulates” (2009:37).

Through the principles both of reason and of faith, *scientia* is able to progress, but for neither is certainty a requirement in Aquinas’ epistemology (*Summa Theologica*, II-II, Q. 6, A. 4, Williams, 2009:38). As Williams emphasises, the limiting and distorting manner of human reasoning – availing itself of self-evident principles or of articles of faith – is acceptable for the Thomist without being certain knowledge, as any theoretical approach is a representation not the thing adequated to in itself (2009:42). In knowing imaged as *adequation* between being and intellect, Saint Thomas conceives knowing as tentative, changing, and essentially adequate but not complete (Williams, 2009:43, Jenkins, 1997:219).⁹⁹

“In this life we are, as Aquinas says, in via – on the way – to this perfect scientia” (Jenkins, 1997:219).

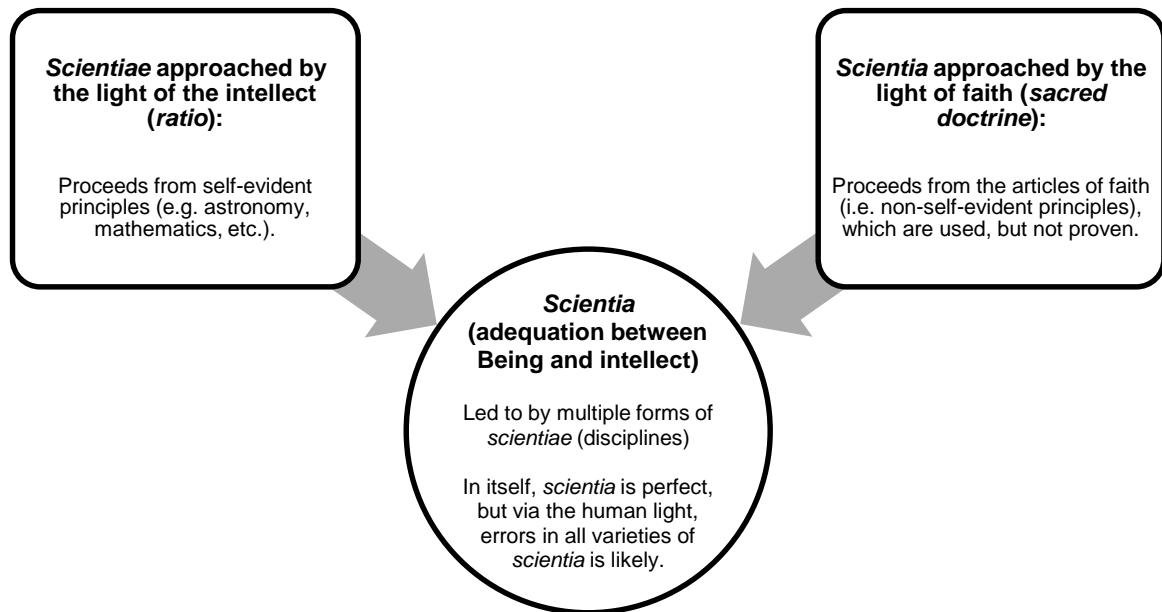
The hopeful glimmers of insight garnered from *scientia* – Aristotelian “*basic truths*” (Aristotle, *Posterior Analytics*, Book I, Part II) – are the metaphysical components of things investigated by the subject (Floyd, 2006:4).¹⁰⁰ Therefore, the understanding held by the subject post-*scientia* is more complete, as it cuts to the essence of the thing investigated, to its being (2006:5). The faith experience, though, is enriched, too, as through *scientia* it comes to be given greater support (*Summa Theologica*, II-II, Q. 6, A. 1). *Scientiae* expands “scientific” boundaries, such that rather than simply investigating apparent physical processes pertaining to a thing, the entire being of the thing is considered.

⁹⁸ “*Its truth is guaranteed solely by God’s own knowledge...*” (Williams, 2009:37).

⁹⁹ “... [T]hese things are not literal descriptions... [but are]... *befitting the knowledge... we have in this life*” (Aquinas, *Summa Theologica*, I, Q. 1, A. 9).

¹⁰⁰ “... [T]hose principles describe fundamental facts about the world by accounting for the natures or essences that substances have” (Floyd, 2006:4).

Saint Thomas' typology of *scientia* could be represented as follows:



1 Saint Thomas Aquinas' typology of "scientia".

But, relating contemporary typologies of science, Aristotelian Thomism conjures a strange image: science should be the product of empirical observation and reason alone. Faith without evidence – with certainty – should not be included in the scientific method!

3.5. *Ratio* and *fides*: the "lights" of *scientiae*:

Reason and faith conceptualised as the two "lights" that lead the human to *scientiae* – knowledge of being – appear as to be opposing dynamics. Whilst the former employs human reasoning supported by evidence made apparent by the senses, the latter – in the common sense view – demands the cessation of the reasoning faculties. It is oftentimes assumed that faith is the acceptance of information that does not conform to either evidence or logic. Richard Dawkins' work serves as an example of this attitude (2006b:132). His notion of the dichotomy between reason (upheld in its purest form in the physical and natural sciences) and positions of faith with regard to evidence for claims is illustrated below:

"... [S]cientific ideas... favour all the virtues laid out in textbooks of standard methodology: testability, evidential support, precision, quantifiability, consistency, intersubjectivity, repeatability, universality, progressiveness, independence of cultural milieu, and so on. Faith

spreads despite a total lack of every single one of these virtues”
(2003a:145).

If Dawkins sought to present a nuanced perspective upon the scientific method, he would have determined that not all instances of scientific practice conform to the methodological criteria generalised to *all* science. For instance, evidential support can be founded upon theories assumed rather than on one’s for which the scientist herself has developed empirical reliability. Moreover, the separation of the scientist from dimensions of his culture is highly problematic, especially as culture is an integral dimension of the identity formation of the human person, who is always secondarily a scientist. Certain cultural expectations necessarily enter the laboratory with the scientist. Writing from within Africa, I note, for example, the different emphases given to Western logical processes from within Western paradigms and those of Africa. Indeed, the whole project of Western science – of which Dawkins is a supreme advocate – could be imaged from the African worldview as nothing but a means to continue Western ideological dominance. After all, for Dawkins, Western scientific methodology is conceptualised as the *sole means* to reliable knowledge of the physical and natural world (2003a:145). This exclusivist and essentialist position has the air of supreme arrogance, an ironic feature given the provisional and speculative characteristics that historical and philosophical studies of scientific theories have revealed.

Despite the supremely trusting emphasis placed upon the ability to reason as illustrated after the rise of Positivism (a temperament which remains much present), the Thomist has need to query whether this absolute reliance is in fact tenable. Likewise, the place of faith and its role in *scientiae* must be queried. As in his own time, and in the spirit of Saint Thomas’ genius, unquestioned acceptance of either is simply philosophically unacceptable.¹⁰¹

In the first reflection of the *Summa Theologica*, Saint Thomas pondered why faith should be required when the human has been endowed with reason (I, Q. 1, A. 1).¹⁰² But, Saint

¹⁰¹ “... [T]he Theologism and the Rationalism of the thirteenth century had at least one common feature; their onesidedness. Theologism would maintain that every part of Revelation should be understood, while Rationalism would uphold the view that no part of revelation can be understood. The historical significance of Saint Thomas Aquinas rests with the fact that he was the first medieval thinker to go to the root of the difficulty” (Gilson, 1939:69).

¹⁰² Aquinas here responds to the critique that:

“It seems that, besides philosophical science, we have no need of any further knowledge” (*Summa Theologica*, I, Q. 1, A. 1).

Thomas provides an exposition of the limits of human reasoning – a theme which we will deliberate over in depth in the following chapter – as his beginning point (I, Q. 1, A. 1). There are, he proposes, “... *certain truths which exceed human reason...*” (I, Q. 1, A. 1). Among these, questions of purpose, teleological matters, origins, etc., may be included. Not all matters concerning the human experience of her reality are reducible to pure reason, but that does not mean that ruminating over them should cease.¹⁰³ Indeed, in the expansion of *scientiae* to include more than only physical and natural science, Aquinas already provides a mode of approaching reality inclusive of the limits of human reason. In his methodology the path to knowing being, reflected in Truth via *scientiae*, is not restricted to reason but to an alternate conduit that in its nature transcends limitations, that of faith. Imperative is Aquinas’ insistence that *scientiae* can “... *be taught to us by another science...*”, and in being opened to extra routes to knowledge of being we realise that it is supremely “*useful*” for human understanding (*Summa Theologica*, I, Q. 1, A. 1).

Aquinas’ discussion on faith’s qualities begins from the Augustinian perspective:

“... [N]o one believes anything unless he has first thought that it is to be believed... everything which is believed should be believed after thought has preceded... even belief itself is nothing else than to think with assent... everybody who believes, things—both thinks in believing and believes in thinking... [I]f we are not capable of thinking anything as of ourselves... we are certainly not capable of believing anything as of ourselves, since we cannot do this without thinking... [I]f faith is not a matter of thought, it is of no account...” (Saint Augustine of Hippo, *On the Predestination of the Saints*, Book I, Chapter 5).

Grounded in the reasonable conception of faith, Saint Thomas states that the intellect enables the act of belief (*Truth*, Q. 14, A. 1 [2008b:207]). This is because in choosing to believe an article of faith, the believer elects to hold that the article is either true or false (*Truth*, Q. 14, A. 1 [2008b:208]). But the act of belief, of the mind’s assenting to an article of faith is not an act of unquestioningly submitting to being, wherein there is no truth (*Truth*, Q. 14, A. 1 [2008b:210]).¹⁰⁴ In being there is simply being, but no judgement as to the truth-value of being itself, as being is ontological and not epistemological.

The differentiation in *Truth* between reason and faith is the manner in which the intellect makes the assent to knowledge. While in pure reason, the intellect moves in sequential

¹⁰³ “... [T]hose things which are beyond man’s [sic] knowledge may not be sought for by man through his reason...” (Saint Thomas Aquinas, *Summa Theologica*, I, Q. 1, A. 1).

¹⁰⁴ The reader will recall the earlier discussion of wherein truth resides (cf. Aquinas, *Summa*, I, Q. 16, A. 3).

process from discursive understanding to knowing, articles of faith come to be held by the believer as knowledge through a parallel process of discursive thought and assent (Aquinas, *Truth*, Q. 14, A. 1 [2008b:210-211]).¹⁰⁵ The items believed are reasoned about simultaneously to their being knowledge. They come to be held as knowledge by the intellect when a judgement is made in a reasoned fashion that the assent to truth should be made despite that the evidence for the assent is not apparent (Aquinas, *Truth*, Q. 14, A. 2 [2008b:217]).¹⁰⁶

“Faith” is thus defined by Saint Thomas as:

“...[A] habit of our mind... which makes our understanding assent to things which are not evident” (Truth, Q. 14, A. 2 [2008b:217]).

The act of faith, however, is only in order to have knowledge utilising the intellect, whereby the object of that knowledge is only ever the First Truth (Aquinas, *Summa Theologica*, II-II, Q. 1, A. 2).¹⁰⁷ This “First Truth” is the most foundational truth, the end of faith, namely God “... and anything else as a consequent addition” (Aquinas, *Truth*, Q. 14, A. 8 [2008b:244-245]). For Saint Thomas, the “subject matter” of the *scientia* of faith is – as with all *scientia* – its principal concern (*Summa Theologica*, I, Q. 1, A. 7). In consideration of articles of faith, the principle object of study is God, for faith directly concerns God (*Summa Theologica*, I, Q. 1, A. 7).¹⁰⁸ In coming towards the First Truth via the intellect, faith brings the intellect to its perfection, to its good, wherein the intellect tends towards the true (Aquinas, *Summa Theologica*, II-II, Q. 1, A. 3). The First Truth, though, is not anything created, nor is it anything perceptible; it is only understandable through the employment of speculative reasoning (Aquinas, *Truth*, Q. 14, A. 4 [2008b:229], *Summa Theologica*, II-II, Q. 1, A. 5). Here faith becomes clearly distinct from *scientiae* via reason.

¹⁰⁵ “... [Faith] still thinks discursively and inquires about the things which it believes, even though its assent to them is unwavering” (Aquinas, *Truth*, Q. 14, A. 1 [2008b:211]).

¹⁰⁶ “... [J]ust as the intelligible thing which is seen by the understanding determines the understanding, and for this reason is said to give conclusive evidence (arguere) to the mind; so also, something which is not evidence to the understanding determines it and convinces (arguere) the mind because the will has accepted it as something to which assent should be given” (Aquinas, *Truth*, Q. 14, A. 2 [2008b:217]).

¹⁰⁷ “... [T]he formal aspect of the object of faith is the First Truth; so that nothing can come under faith, save in so far as it stands under the First Truth, under which nothing false can stand, as neither can non-being stand under being, nor evil under goodness” (Aquinas, *Summa Theologica*, II-II, Q. 1, A. 3).

¹⁰⁸ In terms of articles of faith, “... all things are treated under the aspect of God, either because they are God Himself, or because they refer to God as to their beginning and end” (Aquinas, *Summa Theologica*, I, Q. 1, A. 7 [1999:18]).

But, as always, the Thomist clarification must be made that faith is reasonable, but is not constrained by reason:

“Faith... is said to surpass reason, not because there is no act of reason in faith, but because reasoning about faith cannot lead to the sight of those things which are matters of faith” (Truth, Q. 14, A. 2 [2008b:220]).

Because faith is always the product of the reasoning of the human, the knowledge which it comes to behold is limited. Unlike *scientiae* then, which can be perfect, faith is imperfect knowing, because knowledge of the Divine can never be completely known (*Truth*, Q. 14, A. 9 [2008b:249]). Indeed, once more in the Augustinian line, Saint Thomas clarifies that while we reasonably hold the perceivable object, faith holds that which is not present to the intellect (*Truth*, Q. 14, A. 9 [2008b:250]).¹⁰⁹

Given that reason appears sufficient for the human to function daily, to make acceptable explanations, etc., the consideration of faith’s relevance in contemporary times must arise! If faith is an esoteric, even arcane, theoretical construct, an “add-on” to the human experience, its necessity is dubitable. But, where faith is figured as an approach to knowledge-acquisition exceeding the utilisation of reason alone, what is beyond the bounds of reason’s limits may be seized, and in this process infantile faith is purged.¹¹⁰ Whilst some of the contents of articles of faith are not fathomable via reason as they transcend its explanatory abilities, it does not follow that faith eliminates reason (Aquinas, *Truth*, Q. 14, A. 10 [2008b:257]). As the articles of faith and things which are sensorily perceptible (available to reason) have different objects the one cannot eliminate the other (Q. 14, A. 10 [2008b:257]). The perceived can be reasoned over, and the mode of reasoning may enter the intellect’s consideration when the more general article of faith is considered. In this manner, a continuum between faith and reason can be established for the possibility of knowledge of being.

¹⁰⁹ Articles of faith are not reducible to their first principle, the First Truth – which is God – since we cannot know the imperceptible being of God. On the contrary,

“Whatever things we know with scientific knowledge properly so called we know by reducing them to first principles which are naturally present to the understanding. In this way, all scientific knowledge terminates in the sight of a thing which is present” (Aquinas, Truth, Q. 14, A. 9 [2008b:250]).

¹¹⁰ “[T]o have faith in those things which are beyond the grasp of reason” enables the person to come nearer to the object of belief, namely the First Truth (Aquinas, *Truth*, Q. 14, A. 10 [2008b:255]).

Faith is, though, not bound completely in epistemological terms, for in the Thomist conception it is analogous to a state of “quantum superposition”, comprising simultaneously the characteristics of knowledge and of belief (McInerny, 2006:12). McInerny clarifies that the difference between knowledge and belief lies in how the assent to the content of a dimension of knowledge or belief comes to be held (2006:13). In the case of knowledge, it is from personal experience, whereas of faith it is not (2006:13). In essence, then, knowledge and belief of the same subject cannot be simultaneously had (2006:14). A dichotomy is presented: either you believe something to be true based upon assent to that information via another source, or through personal reason one knows (2006:14). While there is a difference between the trusting relationship of faith in sacred doctrine and those of other sources of information, McInerny demonstrates how scientists, for instance, do not rely solely upon *their* reason to ascertain “valid” scientific results:

“Any scientist holds the bulk of what he holds on the basis of trust in other scientists. The vaunted scientific method is something he has applied to a risibly small fraction of the things he would roundly claim we now know. It would be practically impossible for a scientist to establish as true, to verify, all the claims even in his modest corner of one of the sciences. While that is true, it is important to notice that he can verify any of the claims of his science, however practically impossible it would be for him to verify them all” (2006:16).

Of course, the caveat for the circumspect would be the dearth of Divine faith! We will explore Divine faith’s credibility momentarily. Nevertheless, McInerny’s illustration is essential for the realisation of the extreme degree of reliance placed upon other people and sources in the claiming that particular snippets of information are “true” (2006:16). For not only does the scientist hold what she has scientifically proven as true, she also assents to the truth of the assumed preambles of her particular scientific research. Often this is done without query, out of what could be labelled “blind faith”! Of the action of belief, espoused by our scientist, Saint Thomas explains:

“... Faith implies assent of the intellect to that which is believed... the intellect assents to something, not through being sufficiently moved to this assent by its proper object, but through an act of choice, whereby it turns voluntarily to one side rather than to the other... if there be certainty... there will be faith” (Summa Theologica, II-II, Q. 1, A. 4).

The choice of the subject towards assent to faith is paramount, for it is a corresponding choice made in the assent to Divine faith: without information held in a sensory/experiential manner truth arises (McInerny, 2006:20). The logical issue onward is how any article of faith, whether of a divine or secular sort, can be considered reliable?

Undeniably, Empiricism (of the seventeenth century) and Positivism (of the twentieth century) have impacted upon human knowledge to such a degree that scientific methodology has become fairly accurate, and, in common awareness, almost untouchably certain. The latter assertion is problematic. But, the scientific method has come to demand that reliable and credible knowledge conform to certain foundational characteristics: theories must be described in precise terms, systematically argued for, wherein simplicity is favoured, and the theory must be validated by “*experiential evidence*” (Hempel, 1965:117). The logical empiricist Hempel practically discarded epistemological theories that did not conform (1965:117).¹¹¹ It is little wonder, therefore, that materialist science – following the Empiricist and Positivist traditions – reject out-of-hand belief systems that appear as irrational, improvable and indefensible! (Fergusson, 2009:34-36) Assumed herein, however, is an overly simplistic impression of science as only holding knowledge of empirically observed entities as they are, without subjective interpretation of the representations beheld by the senses. This is a metaphysical position, however (McCabe, 2007:3). Necessarily, the more fundamental questions perturbing the philosopher with metaphysical proclivities are struck from relevance to knowledge enquiry.

Is the faith held by theistic believers to be deemed as no more than “wishful thinking”? (McCabe, 2007:1) Certainly it must be acknowledged by faith’s adherents, that faith proposed without good reason is nothing more than self-delusion on the part of the thinking subject. But, if a faith-position is held, and that position is held to be true, from whence emerges the reasoned support for that faith position? (2007:4) In a stronger sense, an article of faith declared to be true is more than an informed guess (2007:5). In a definitive sense, faith as a human response should conform to the humanly reasonable expectation of logical consistency (2007:5).

In this peculiar mode of acting in response to the context within which humanity finds herself, faith is an anthropological, not divine, attempt at reasonably accounting for the way in which things are.¹¹² Therefore, despite that the object of faith is “God”, the Divine object is necessarily a humanly construed and mediated representation of being,

¹¹¹ “Many of the speculative philosophical approaches to cosmology, biology, or history, for example, would make a poor showing on practically all of these counts and would thus prove no matches to available rival theories, or would be recognized as so unpromising as not to warrant further study or development” (Hempel, 1965:117).

¹¹² “... [T]he content of faith is a human content, a matter of human history, and not a matter of remote uncheckable events at the back of the moon” (McCabe, 2007:7).

measurable by the best available modes of human reasoning. To some degree, faith is always anthropocentric! But in directing the thinking subject beyond the confines of the subject, faith is more than anthropocentrically self-referential. Does it hold up as more than self-projection, however?

Any knowledge, McCabe argues, involves a holding to the decision of accepting beyond available evidence (2007:12). The scientist chooses to hold that what she explores is real and not a self-construction. Analogously, the parent chooses to love his child despite the potentially disastrous outcome of doing so.

Is faith then no more than wishful thinking? It may well be that faith in the divine is no more than wishful thinking. But, given that many dimensions of the human experience are precisely wishful thinking, perhaps the well-reasoned argument should be along the lines that wishful thinking in a reasonable manner – that is, which is logically consistent – is a profoundly human way of being. Can faith be proved beyond available evidence? No. But it can be possessed rationally. Reason is key to the tempering of articles of faith, such that they are not irrational. For in irrationality lies profound lack of humanity.

The capacity to reason can be picked as the hallmark of humanity.¹¹³ Reason is not a clear-cut concept, however, and requires problematising for its adequate description. One may, for instance, ponder whether the faculty of reason is simply the ability to understand?

Saint Thomas provides an elucidation of the problem, explaining vividly the distinction between understanding and reason as non-synonymous terms (*Truth*, Q. 15, A. 1 [2008b:272]). “Understanding” (“*intelligere*”) is to possess perfect *scientia*, that is, knowledge of the thing in itself (*Truth*, Q. 15, A. 1 [2008b:272]). It is to this ideal form of knowing that the Thomistic broadened definition of “science” must lead. But, defining the ability to reason is not focused entirely upon the knowledge-content held by the process of reason. Instead, its definition refers to the aptitude that the human has been afforded to proceed between theoretical postulates in order that “... *knowledge of something*

¹¹³ Saint Thomas uses the example of Saint Augustine from his *De Trinitate*, where reason or intelligence is conceptualised as the delineating factor between the human and other animals (Saint Augustine of Hippo, *On the Trinity*, XV, Ch. 1, Aquinas, *Truth*, Q. 15, A. 1 [2008b:270]). Indeed, the faculty of reason is a broadly understood mark of the separation between the human animal and others, particularly in common parlance.

else...” becomes possible (*Truth*, Q. 15, A. 1 [2008b:272-273]).¹¹⁴ Describing reasoning in processual terms, Saint Thomas articulates:

“All men [sic] by nature desire to know the truth; they also have a natural desire to avoid error and to refute it when the opportunity arises” (Saint Thomas Aquinas, *De Unitate Intellectus*, Ch.1, §1, in McNerny, 1993:19).

Understanding, requires reasoning-ability to advance in a sequential manner from idea to idea (*Truth*, Q. 15, A. 1 [2008b:274]).¹¹⁵ When understanding to the level of “*scientia*” is obtained, then reason has reached its good whereupon – through systematic processes – knowledge of the entity under study itself is made known (*Truth*, Q. 15, A. 1 [2008b:275]). That it is a particular entity which is focused upon, emphasises that reasoning has its origin within the embodied human and the embodied experience of the real.

“For this reason, the gaze of our understanding, which is properly called reason... fastens on the natures of sensible things. From this it rises in knowledge of created spirit...” (*Truth*, Q.15, A.1, 2008b:276-277).

The path of reason leads to the consideration of metaphysical truths, that is, of themes transcending physical science. Through the processual nature of reason, the subject is able to abstract from the mundane experience of particulars evident via sensory perception toward *scientia* of things in themselves, e.g. ontological and metaphysical problems ever-present and requiring of attempts at solving. In reason – conceived as a progression from the senses towards that which is more fundamental to the being of any particular entity – the Thomist theoretical model of a continuum of knowledge between the physically apparent and the metaphysical, reasonably construed, comes to significance.

Despite Aquinas articulating a distinction between faith and reason, they are not dichotomous entities (Milbank & Pickstock, 2001:19). It is the contention of Milbank and Pickstock that the presumption that Aquinas sees faith and reason as opposing was the product of other scholastic and modern philosophers and not of his own work (2001:19). Their reading of the Thomistic sources on faith and reason is that Saint Thomas construes

¹¹⁴ Discussion of reason to humans is limited in this work, as the ability of non-human animals to reason falls outside of its scope of relevance.

¹¹⁵ *“For this reason, the proper act of understanding is attributed to reason...”* (Aquinas, *Truth*, Q. 15, A. 1 [2008b:274]).

both as closely intertwined phases within a singular process of establishing knowledge of being (2001:21).

In his AD 1261 work, the “*Exposition of the ‘De Trinitate’ of Boethius*”, Saint Thomas puts forward his typology of the relationship between faith and reason.¹¹⁶ Much of the discussion entered into in this text specifically concerns Aquinas’ defence that reason should be involved in matters pertaining to faith and that faith should be reasonably expressed (*De Trinitate*, Q. 2, A. 1). Amidst the catchphrases which would certainly have been levelled contrary to Aquinas’ position is that of Saint Ambrose of Milan, who declared – in a very anti-philosophical manner – that reason should be expunged from articles of faith (Aquinas, *De Trinitate*, Q. 2, A. 1 [1999:25]).^{xv} Similarly, Aquinas cites Pope Saint Gregory the Great’s maxim which has become a central point for discussion on the separation of reason from faith (*De Trinitate*, Q. 2, A. 1 [1999:26]):

“Neither does our faith have any value, if human reason furnishes it with experimental proof” (Saint Gregory the Great, *Homily 26* [2001:92]).

Notwithstanding these antagonistic approaches from within the Church Fathers, Saint Thomas holds that it is only possible to defend an article of faith if that article is reasoned about, as in the first instance the holder of faith adequately grasps the article and then can explain it in a systematic and reasonable manner (*De Trinitate*, Q. 2, A. 1 [1999:26]).¹¹⁷

Having already proposed that *scientia* of something can be held in an imperfect manner, Saint Thomas continues that the process of reasoning about matters of faith should not be assumed as having the end goal of understanding about God (*De Trinitate*, Q. 2, A. 1 [1999:28]). Knowledge of articles of faith is limited, such that whilst recognition of their Divine nature can be made, we cannot know the essence of the Divine (*De Trinitate*, Q. 2, A. 1 [1999:28]).¹¹⁸

¹¹⁶ The Latin title for this text is: “*Expositio super librum Boethii De Trinitate*”.

¹¹⁷ “... [We must] *inquire rationally into what we hold on faith. Therefore a rational investigation into matters of faith is necessary... [O]nly by arguments can we refute those contradicting the faith. Therefore it is necessary to use reasoning in matters of faith*” (Aquinas, *De Trinitate*, Q. 2, A. 1 [1999:26]).

¹¹⁸ “... [W]e can know that *divine realities are but not what they are*” (Aquinas, *De Trinitate*, Q. 2, A. 1 [1999:28]).

Earlier we saw the precarious nature of articles of faith: simply, they cannot be proved through empirical means as true. It was also already demonstrated that the level of doubt raised about them cuts in both directions, i.e. that as much as articles of faith cannot be proved to be, they also cannot not be proved to be (cf. Aquinas, *De Trinitate*, Q. 2, A. 1 [1999:28]). However, for Saint Thomas, an article of faith should not be proven or disproven: if it is proven one would of necessity have to hold it, and if it were disproven one would necessarily have to reject it (*De Trinitate*, Q. 2, A. 1 [1999:28]). The manner of reason which should be employed in terms of faith must be persuasive rather than necessary (*De Trinitate*, Q. 2, A. 1 [1999:28]). Hence, for Aquinas, reason should be used by the person of faith to strengthen articles of faith without diminishing them to reason itself, that is, to self-evident principles (*De Trinitate*, Q. 2, A. 1 [1999:28]).

“... [P]ersuasive reasoning, drawn from analogies to the truths of faith, does not take away the nature of faith because it does not render them evident... Neither does it deprive faith of its merit, because it does not compel the mind's assent but leaves the assent voluntary” (*De Trinitate*, Q. 2, A. 1, [1999:28]).

Were reason employed solely without faith, or were faith reduced to reason, only the empirically verifiable would be possible, thus reducing the prospect for understanding to come to any adequate grasp of being. In this manner, philosophical reasoning should not be commissioned with the task of proving articles of faith by virtue of its prowess in reasoning-ability (*De Veritate*, Q. 2, A. 3 [1999:38]).

Adding to the counter-rational nature of faith, though, is that knowledge of faith precedes the reasoning capacity, whereas from the reasonable approach, knowledge emerges as the product of reason (*De Trinitate*, Q. 2, A. 2 [1999:29]). Should reason be employed in articles of faith? Moreover, how would it be possible to utilise reason in faith, given that knowledge of articles of faith arises irrationally?

As a philosopher-theologian working within Natural Theology, Saint Thomas hearkens back to Saint Augustine who saw the hand of the Creator present in the creation (*De Trinitate*, Q. 2, A. 3 [1999:36]).¹¹⁹ Reflection upon this same creation should also then be embraced, for it can only be good to know more about the creation of the Creator rather

¹¹⁹ “I will not be slow to search out the substance of God, whether through His Scripture or through the creature. For both of these are set forth for our contemplation to this end, that He may Himself be sought, and Himself be loved, who inspired the one, and created the other” (Saint Augustine of Hippo, *On the Trinity*, Book II, Preface).

than limiting oneself by choice to scriptural revelation (*De Trinitate*, Q. 2, A. 3 [1999:36]).¹²⁰ The unitary approach of Saint Thomas is thus enunciated:

“... [T]he light of faith... does not do away with the light of natural reason... And even though the natural light of the human mind is inadequate to make known what is revealed by faith, nevertheless what is divinely taught to us by faith cannot be contrary to what we are endowed with by nature. One or the other would have to be false...” (Aquinas, *De Trinitate*, Q. 2, A. 3 [1999:36]).

The aforementioned position assumes that both faith and reason are epistemological processes leading to *scientia*. What is reasoned about and held as true cannot be contrary to the content of a true article of faith.^{xvi} And the purifying dimension of reason is precisely that where an erroneous principle is held – whether by reason or by faith – the said falsity must be reasonably removed (*De Trinitate*, Q. 2, A. 3 [1999:37]).

3.6. Conclusion:

In an epoch when both anti-metaphysical and anti-realist theories have flourished, especially through the philosophical works of Kant, Hegel, Nietzsche, and those who took the linguistic turn (among them Wittgenstein, Rorty, etc.), the enterprise of science has come to defy much philosophy. To be sure, the gulf between science in practice and a good deal of contemporary philosophy has been widened as a result. In a marked way, scientists have suggested by their method, research and findings that there is a “real” world, a reality, beyond the subject. In this chapter, the case for realism founded upon both the successes of science and the inadequacies of anti-realist theories when confronted with science, itself, has been argued for.

The humanness of scientific ventures, though, eliminates the likelihood that scientific knowledge is objective. In fact, it is thwarted continuously by its formation as a human product, succumbing to matters of culture, taste, language, political orientation, and the like. Naïve realism, whether in metaphysical or scientific guise, cannot be accepted.

A critical stance on realism, which is more in keeping with what is known about scientific methodology and knowledge is more acceptable. Herein, the subject (as the creator of scientific methodology) and the object (the cause via the scientific method of scientific

¹²⁰ “... [I]f those who are called philosophers... have said anything that is true and in harmony with our faith, we are not only not to shrink from it, but to claim it for our own use from those who have unlawful possession of it” (Saint Augustine of Hippo, *On Christian Doctrine*, Book II, Ch. 40).

knowledge) are held in a delicate balance. Because both being and knowing are given accord means that through a clarified realism, the *Epistemic Fallacy* – the fault of the Moderns – is avoided.¹²¹ Being remains fundamental and stays as the primary concern of philosophy as opposed to knowledge of being, which is always a step removed from the thing with being itself.

Saint Thomas Aquinas carefully formulated the intimate relationship between being and Truth. Through his typology the ontological and epistemological dimensions of a clarified realism have been ennobled to step out as a cornerstone to the theoretical framework for this research. Aquinas' realism emphasises the ontological dimensions of claims to Truth, as he envisaged Truth as contained both in the thing (being) and in the intellect. A statement can only be true when it declares being. As such, being is not made more by its relation to a true statement. On the contrary, truth is dependent upon being. Being hence is adequated to in all true statements that are directors towards the thing for the subject, which is the constructor of scientific theory. In the Thomist account, the thing and the intellect are so tightly interwoven that a clear separation between ontology and epistemology is not readily possible. But, contrary to the Kantian, the Thomist can only have knowledge of a thing because that thing exists. Being is necessarily primary.

Among the forms of adequation to being is *scientia*, tied only etymologically to current impressions of "science". As an instance of adequation to being, *scientia* must be categorised in a broader sense than "science". Not only does it concern knowledge of particulars, but it includes knowing related to ultimate foundations which has been excised from "science" (as an empirical activity). Contained within *scientia* thus, is metaphysical knowledge. In reconceiving "science" along the lines of the Aristotelian-inspired Thomist "*scientia*", the definition of what is contained within science is stretched beyond the bounds of current physical and natural science to include multiple dimensions of the singular reality. Among these we find themes of causality, origins, faith, and the object of faith: God. Beyond a one-dimensional model through which physical data is interpreted by reason, *scientia* replaces consideration of ultimate questions, such as the problems of creation and being, to the locus of the scientific pursuit.

Scientia is developed by two "lights", namely reason and faith. Criticism abounds against the latter as "unscientific". Usually this is only done when reason is elevated to

¹²¹ One will recall that the "*Epistemic Fallacy*" refers to the Modern penchant of reducing ontology to epistemology (Bhaskar, [1978]2008:16, 1998:27).

untouchable omnipotence, assumed as it is that reason is without prejudice, influence, or error. As the human is the instigator of science, though, reason is not the sole influence of her theories. The person can never be reduced to logical verification of empirical facts!

Faith, as it has been put forward, is a reasonable choice. It is a free action whereby the mind of the subject ascends to the empirically transcendent, namely the immeasurable First Truth, the ultimate cause and sustainer of being. In a similar parallel process of faith, the scientist chooses to believe in subscribing to foundational “truths” that support her own theoretical position. These are not arrived at personally by her research. Rather they are held by virtue of an assent to faith to that proved by other scientists. This assent, whether made by the scientist or the holder of First Truth, is not wishful thinking that the content of the belief held is true. Indeed, if logically consistent and supported by sufficient reason, the article of faith is not a fantasy. Fundamentally it is a human mode of responding to the great mystery of being, always apparent, which is not exhausted by the scientific method.

The first criticism aimed at faith is that it cannot be empirically proved. If not empirical, this is tautologous. However, it should be noted that the assertion that only empirically verifiable statements are acceptable claims to knowledge is in itself a metaphysical statement that transcends empirically verifiable evidence. The vastness of being ensures this! Moreover, that same immensity should in humility be free to demand multifarious modes of explanation.

The human route to understanding is not one dimensional, but a multi-modal experience wherein the facets of faith and reason are united in grasping the Truth that is: being. Consistently, for the Thomist, reason and faith are united, engaged with one another, such that reason purifies faith from falsity and faith pushes reason to pose and seek answers to the most fundamental questions pertaining to reality.

Rather than remaining as a critique of the superficiality of a particular understanding of the scientific method, the metaphysical has itself been stretched in this chapter. For, if metaphysics seeks to explore reality it must be closely related to the entities unearthed and theorised about in natural and physical science, with a duty to be grounded in the real (Gilson, [1937]1999:247). Similarly, if science’s task is to consider real things, these can

only be abstracted in relation to being (Gilson, [1937]1999:251).¹²² The gamut of scientific knowledge is always incomplete if the dialogic between physical and natural science and considerations of being is not present (Gilson, [1937]1999:253). From particular exposure of individual beings, the problem of existence and the abstraction of the broader notion of being must arise within the scientist (Maritain, 1995:5, Gilson, [1937]1999:254).¹²³ Rooted in the real, both science and metaphysics – *scientia* – together explore nature in relation to being – extant and accessible – apparent before the face of the seeker (Gilson [1937]1999:254).

This Thomist system – wherein being is construed prior to the known – images *scientia* as having access to knowledge of being in Truth, as held by the intellect. It is hence a philosophical approach with relevance to the enterprise of contemporary knowledge production, found in the real, to aid understanding. Thus, the Thomist challenges both Modernity and Postmodernity in transcending the object/subject distinction (and overemphasis) by re-embracing being: a process embarked upon by Saint Thomas in the thirteenth century in his critical realist ontological epistemology, which sought to integrate Ancient Greek, Islamic, and prior Scholastic philosophy, theology and science.¹²⁴ Realistically, contemporary scholars should thus be challenged and strengthened to courageously seek out being in contemporary science. However, as has been demonstrated this can only be done by enlarging the scope of “science” to incorporate being. The consequence of not transcending this limit is that metaphysics will remain a “*quaint*” item of history for study, but not for serious and sustained research. Aquinas offers the freedom to counter this all-too-populist orientation.

“One is not a Thomist because, in the emporium of systems, one chooses it as if one were choosing one system among others just as you try one pair of shoes after another in a shoe store until you find a pattern that fits your foot better... One is a Thomist because... one wants to seek out what is true...” (Maritain, 1995:xiii).

¹²² *“Absolute nothingness is strictly unthinkable, for we cannot even deny an existence unless we first posit it in the mind as something to be denied”* (Gilson, [1937]1999:251-252).

¹²³ *“That which is but a particular determination of being, or a being, will be invested with the universality of being itself”* (Gilson, [1937]1999:254).

¹²⁴ I have utilised the term “ontological epistemology” to articulate the Thomistic standpoint that being precedes knowing, that is, that ontology precedes epistemology. In order, therefore, for any epistemic statement to be true, that statement must conform to the primacy of being.

Notes:

ⁱ The Leonine revival of Saint Thomas Aquinas – through the 1879 encyclical letter of Pope Leo XIII, *Aeterni Patris*, that sought to reaffirm Christian Philosophy ended focusing upon Aquinas – returned Aquinas to the heart of Catholic intellectual thought (1879). Indeed, of Saint Thomas, Leo wrote rather hagiographically:

“With his spirit at once humble and swift, his memory ready and tenacious, his life spotless throughout, a lover of truth for its own sake, richly endowed with human and divine science, like the sun he heated the world with the warmth of his virtues and filled it with the splendor of his teaching. Philosophy has no part which he did not touch finely at once and thoroughly; on the laws of reasoning, on God and incorporeal substances, on man and other sensible things, on human actions and their principles, he reasoned in such a manner that in him there is wanting neither a full array of questions, nor an apt disposal of the various parts, nor the best method of proceeding, nor soundness of principles or strength of argument, nor clearness and elegance of style, nor a facility for explaining what is abstruse” (1879).

After this clear exercise in marketing on behalf of Thomism, there was a significant rise in Catholic intellectuals paying careful attention to the works of this thirteenth century Dominican friar. Among them were the “Transcendental Thomists” who sought an encounter between Modernity and Aquinas, such as Maréchal (1878 – 1944), Lonergan (1904 – 1984) and Rahner (1904 – 1984) (Kerr, 2002:vii). Their contemporaries Maritain (1882 – 1973) and Gilson (1884 – 1978), however, attempted clear historical readings of Aquinas’ work so as to keep it uncontaminated by Modernity (2002:vii). In the early 1990’s, Thomism’s engagement with Anglo-American Analytic Philosophy was concretised in John Haldane’s delineating this particular form “Analytical Thomism”, wherein again, there is a meeting-place between different Philosophical approaches (Haldane, 1997:485-486, Paterson & Pugh, 2006:xx).

In some ways the approach this work takes to Thomism is in sympathy with those of the Transcendental Thomists, in that a dialogue occurs between Thomism and issues of Modern and Postmodern Philosophy, particularly related to philosophy of science. However, because the adopted methodology is one of historical reconstructivism, the author seeks to return to the primary texts of Saint Thomas in developing the perspective utilised. As the concepts and terminology employed by Saint Thomas were specific to his context, we should of course always read them contextually and not readily attempt to transpose them to the 21st century, for if we read them on our own terms we will lose their essential meaning (Jenkins, 1997:1, 3).

In order to emphasise the utilisation of Aquinas’ primary texts in the development of this work as opposed to the work of various Thomists, the choice for the term “Thomist” rather than “Thomistic” has been employed in the title of this chapter.

ⁱⁱ Despite Kant’s sceptical stance towards the *Ding an sich* (“thing-in-itself”), he nevertheless placed much emphasis upon Newtonian physics, considering it a philosophical revolution (DiSalle, 2002:191). Indeed, in the B Preface of *The Critique of Pure Reason*, Kant considers the oxymoronic nature of reason and its informing the scientific method to obtain knowledge of nature:

“... [R]eason only perceives that which it produces after its own design... but must proceed in advance with principles of judgement according to unvarying laws, and compel nature to reply [to] its questions... But it is this that reason seeks for and requires... Reason must approach nature with the view... of receiving information from it... [as] a judge, who compels the witnesses to reply to those questions which he himself thinks fit to propose. To this single idea must the revolution be ascribed, by which, after groping in the dark for so many centuries... science was at length conducted into the path of certain progress” ([1787]2010:12).

The scientifically-inclined Kant, as well as his critical method – particularly in answering the core problem of his *Critique of Pure Reason*, namely, “How are synthetic a priori judgements possible?” – of questioning the principles that make knowledge possible, inspired the later work of the Logical Positivists (Friedman, 2002:171, 188). So great was Kant’s exultation of Newtonian science, though, that he transposed the set Newtonian mathematical principles into human reason (2002:182-183).

“... [Newtonian] categories and forms, for Kant, are definitive... of an absolutely universal rationality governing all human knowledge at all times and in all places” (2002:183).

The positivist Carnap had begun his academic career as a follower of Kant (Carnap, [1963]1997:10, Hanna, 2008:172). He was, however, to transcend Kant hugely.

“... I was mainly interested in the theory of knowledge and in the philosophy of science... I studied Kant’s philosophy... [in] the Critique of Pure Reason... [and] was strongly impressed by Kant’s conception that the geometrical structure of space is determined by the form of our intuition... Knowledge of intuitive space I regarded at that time, under the influence of Kant... as based on ‘pure intuition’ and independent of contingent experience” (Carnap, [1963]1997:4, 12).

The separation between Kant and Carnap occurred in the latter’s dismissal of metaphysics as meaningless ([1963]1997:9). While the Kantian thinking subject does not have access to the *Ding an sich*, this does not imply that it (the *Ding an sich*) does not exist. On the contrary, Carnap conceptualised human understanding as limited to the subject (Hanna, 2008:173). The relation between the real and the subject – where the former is independent of the subject – was deemed by him as being metaphysical (and thus, meaningless) (Carnap, [1961]2003:284). His reasoning was that reality (“... *in the [Kantian] sense of independence from the cognizing subject...*”) could not be constructed physically by the thinking subject, that is, in an experiential manner ([1961]2003:282-283). Thus, it was metaphysical ([1961]2003:284). The perceived “real”, was therefore, only present in the subject’s consciousness (Hanna, 2008:173). Rorty articulates the Carnapian approach to metaphysics:

“... [T]ell us what counts for or against what you are saying, and we shall listen; otherwise we have a right to ignore you” ([1967]1992:5).

From the Kantian “transcendental turn”, the “linguistic turn” occurred, partly through the influence of the Vienna Circle (Hanna, 2008:173). So great was its curve away from Kant, that the relations between the scientific and the objective world were severed, such that Quine could declare:

“The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric...” (1951:39).

iii Fuller cites the 1993 example of Weinberg defending the Supercollider from a realist perspective (1994:200-201). In 2012, the discovery of the Higgs boson at CERN (The European Organisation for Nuclear Research), could be employed in support of a realist understanding, for on 4th July 2012 a press-release was announced from Geneva stating:

“We observe in our data clear signs of a new particle, at the level of 5 sigma, in the mass region around 126 GeV... We stated last year that in 2012 we would either find a new Higgs-like particle or exclude the existence of the Standard Model Higgs. With all the necessary caution, it looks to me that we are at a branching point: the observation of this new particle indicates the path for the future towards a more detailed understanding of what we’re seeing in the data” (CERN, 2012).

From this statement it is clear that no instrumentalist interpretation of data was given. Instead, there is a clear declaration of the discovery of a dimension of reality – the Higgs boson – a particle which exists.

iv What has come to be known as the “Galileo Affair” was one of history’s ultimate pittings of faith against reason, and is oft cited as an example of the Church’s dislike for science (Feldhay, 1995:13). Caught up in the case was a “Cardinal Inquisitor”, Robert Bellarmine S.J. (AD 1542 – 1621).

Galileo had embraced Copernicanism, however, on 23rd February 1616, the Church’s Holy Office had declared the heliocentric model as dissonant with Church teaching (1995:14). On the 12th April 1615, Cardinal Bellarmine wrote to Galileo’s fellow Copernican, the Prior Provincial of the Carmelite Friars, Father P.A. Foscarini, noting the hypothetical nature of the Copernican research of Foscarini and Galileo (Bellarmine, [1615]2008:146).

“Your Paternity and Mr. Galileo are proceeding prudently by limiting yourselves to speaking suppositionally and not absolutely, as I have always believed Copernicus spoke” [the emphasis is the author’s own insertion] (Bellarmine, [1615]2008:146).

The instrumentalist approach of Bellarmine was solely an attempt to maintain the integrity of the Scriptures ([1615]2008:146). However, what his take on Copernicanism did bring to the fore was the tentative nature of scientific theory: science is never absolute and thus should not be declared as such (Feldhay, 1995:17). Bellarmine, as it turned out was most in conformity with current philosophy of science. Galileo, on the other hand, held resolutely to Copernicanism, considering it to be absolutely true (1995:17). More nuance would have made for better science.

^v Duhem (1861 - 1916) considered the realist explanations sought in scientific theories as unscientific, in fact as metaphysics (Stanford, 2006:401).

In a similar manner, Mach (1838 - 1916) deemed theoretical constructs of scientific theories (e.g. atoms), as remaining within their explanations as they only describe sensory experience not reality (Stanford, 2006:401).

Poincaré (1854 - 1912), too, put forward a position against metaphysics:

“[T]he question... Is Euclidean geometry true?... has no meaning. We might as well ask if the metric system is true, and if the old weights and measures are false... One geometry cannot be more true than another; it can only be more convenient” (Poincaré cited by Stanford 2006:401).

^{vi} With a tendency against instrumentalist-like theories, Popper declared:

“... [I]f we do not know how to test a theory we may be doubtful whether there is anything at all of the kind (or level) described by it; and if we positively know that it cannot be tested, then our doubts will grow; we may suspect that it is a mere myth, or a fairy-tale. But if a theory is testable, then it implies that events of a certain kind cannot happen; and so it asserts something about reality... Testable conjectures or guesses, at any rate, are thus conjectures or guesses about reality...” (Popper, 1962:117).

In line with instrumentalism’s inability to be proven via empirical testing we may question metaphysics. In a similar manner, metaphysical theories can be developed that are rational and coherent – not merely speculative – even if the theory is not provable empirically. Instead, the test of the theory is not whether it bumps up against reality, but whether the assumptions of the theory determine the theory’s likelihood. And, as Rorty argues, there is no getting away from either metaphysical or epistemological assumptions in the process of knowledge acquisition: without them knowledge is impossible ([1967]1992:1).

“... [Philosophers presuppose] the truth of certain substantial and controversial philosophical theses... Every philosophical rebel has tried to be ‘presuppositionless,’ but none has succeeded... [I]t would indeed be hard to know what methods a philosopher ought to follow without knowing something about the nature of the philosopher’s subject matter, and about the nature of human knowledge. To know what method to adopt, one must already have arrived at some metaphysical and some epistemological conclusions” ([1967]1992:1).

^{vii} These include:

- “... (1) the theory must be successful over a significant period of time;*
- (2) the explanatory success of the theory gives some reason, though nor a conclusive warrant, to believe it;*
- (3) what is believed is that the theoretical structures are something like the structure of the real world;*
- (4) no claim is made for a special, more basic, privileged, form of existence for the postulated entities”* (McMullin, 1984:26).

^{viii} If, as Saint Augustine pointed out, only that which exists can be considered true (*Soliloquies*, Book II, No. 8, 1910:65), Aquinas wonders whether anything can be false? (Aquinas, *Truth*, Q.1, A.10 [2008a:42]). As truth is said Thomistically to be both ontological and epistemological, we can clearly determine that falsity is not an ontological problem but rather an epistemological one (Aquinas, *Truth*, Q. 1, A. 10 [2008a:44-45]).

*“In its relation to a human intellect... an inequality of thing with intellect, caused in some way by the thing, is occasionally found; for a thing makes itself known by the soul by its exterior appearance, since our cognition takes its being from sense, whose direct object is sensible qualities... Consequently, when there are manifested in any object sensible qualities indicating a nature which does not actually underlie them, that thing is said to be false... truth and falsity exist principally in the soul’s judgment” (Aquinas, *Truth*, Q. 1, A. 10, 2008:44).*

^{ix} Aristotle called the “basic truths” that do not require any further demonstration, “first principles” (Aydede, 1998:16). However, it is problematic for the Aristotelian argument that these “first principles” are not further supported by an empirical claim (1998:16). Presumably, among the tasks of the epistemologist is to attempt to validate any claim to knowledge (1998:16). It is unsatisfactory for demonstrable knowledge (*epistemé*) to be founded in the indemonstrable, i.e. the “first principles” (1998:21). Aristotle was aware of this problem, however:

“Some hold that, owing to the necessity of knowing the primary premises, there is no scientific knowledge. Others think that there is, but that all truths are demonstrable” (Posterior Analytics, Book I, Part III).

In the *Posterior Analytics*, Aristotle deviates from conventional epistemology, proposing that some knowledge is not demonstrable, but nevertheless remains knowledge (Book I, Part III). He provides the following argument in support of his claim of the necessity of some “basic truths”:

“Since the object of pure scientific knowledge cannot be other than it is, the truth obtained by demonstrative knowledge will be necessary. And since demonstrative knowledge is only present when we have a demonstration, it follows that demonstration is an inference from necessary principles” (Posterior Analytics, Book I, Part IV).

In Aydede’s explanation, these unqualified premises are *per se*, the foundations of *epistemé*, self-explanatory propositions, demonstrating the being of nature (1998:26).

^x The issue of Aquinas as an epistemological foundationalist – whereby knowledge is founded in more primary beliefs – has been much discussed but is outside of the scope of this work. Nevertheless, it is worth considering the positions held. The theme is well covered in Williams’ article “*Is Aquinas a Foundationalist?*” (2009). Plantinga, for instance, argued that foundationalism was false, and labelled Aquinas as a foundationalist (1983:17, 2000:82). McInerny stands in agreement with Plantinga, proposing that Aquinas as a foundationalist is neither a fideist nor an evidentialist (McInerny, 1986:284, Williams, 2009:27). However, as knowledge for Aquinas is not certain, Stump rejects that Aquinas is a foundationalist (Stump, 1991:133, 136-137, 143, Williams, 2009:30). Williams, too, rejects that Aquinas is an epistemological foundationalist, as he proposed that knowledge is fragile because of “... *the inevitability of human error...*” (2009:44). I would argue that because Aquinas deems humanly constructed knowledge as potentially erroneous, and that he places ontology as primary, he is not an epistemological foundationalist, but is an ontological foundationalist: Being comes before knowing.

^{xi} Providing room for human error, Saint Thomas in a few places of the *Summa Theologica*, argues:

“... [S]ciences derive their certitude from the natural light of human reason, which can err...” (I, Q. 1, A. 5),

And again:

“The perfect act of the intellect is complete knowledge, when the object is distinctly and determinately known; whereas the incomplete act is imperfect knowledge, when the object is known indistinctly, and as it were, confusedly” (I, Q. 85, A. 3).

^{xii} Aristotle names science along with wisdom and understanding as virtues of the intellect, and Aquinas contends these lead to truth for that is the “... *good work...*” of any intellectual virtue (Aquinas, *Summa Theologica*, I-II, Q.57, A.2). Indeed, Saint Thomas further defines the intellect’s task by exploring its etymology:

“The name intellect arises from the intellect’s ability to know the most profound elements of a thing; for to understand (intelligere) means to read what is inside a thing (intus legere). Sense and imagination know only external accidents, but the

intellect alone penetrates to the interior and to the essence of a thing” (Truth, Q. 1, A. 12 [2008a:50]).

The particular good of the intellect is therefore to aid in the apprehension of Being via *scientiae*. But, argues Jenkins, this is not a rapid process (1997:115). Instead, the intellect proceeds from initial experiences of particular things to abstract conceptions of universals, that is, of being (1997:115):

“... [K]nowledge of the singular and individual is prior, as regards us, to the knowledge of the universal; as sensible knowledge is prior to intellectual knowledge. But in both sense and intellect the knowledge of the more common precedes the knowledge of the less common” (Aquinas, *Summa Theologica*, I, Q. 85, A. 3).

^{xiii} The French Dominican Marie-Dominique Chenu (1895 – 1990), for instance, argued that sacred doctrine is a deficient *scientia* (Jenkins, 1997:51,53):

“... [T]he perfect quality of this eminent knowledge which is science is only conceivable and possible if the mind is totally and immediately master of its initial datum...” (Chenu, 1943:73, translated by Jenkins, 1997:53).

Of course, given that the more basic principles of sacred doctrine refer to knowledge which is not subject to the perceiver – following Chenu - sacred doctrine would not be considered *scientia* (Jenkins, 1997:53). Saint Thomas expands upon the vagaries of how the subject matter of faith can be considered as knowledge, however:

“Faith is a kind of knowledge, inasmuch as the intellect is determined by faith to some knowable object. But this determination to one object does not proceed from the vision of the believer, but from the vision of Him who is believed. Thus as far as faith falls short of vision, it falls short of the knowledge which belongs to science, for science determines the intellect to one object by the vision and understanding of first principles” (*Summa Theologica*, I, Q. 1, A. 13).

In Chenu’s estimation, Saint Thomas has clearly admitted that sacred doctrine is not *scientia* in the sense of the *Posterior Analytics* (Chenu, 1943:55, Jenkins, 1997:53). Jenkins, however, disagrees with Chenu, arguing instead that sacred doctrine shares similarities with other *scientiae* (1997:51).

The divergence between Aquinas and Aristotle in terms of *scientiae*, however, is that whilst Aristotle’s *Posterior Analytics* deals exclusively with human *scientia*, Aquinas considers sacred doctrine to be of a dual-fold (“mixed”) character in that it is pursued by human beings but is grounded in articles of faith (1997:66-67). Whilst there are differences between the forms of *scientiae*, Aquinas’ accentuation of the various forms of *scientiae* in the *Summa Theologica* provides a Thomist alteration of the Aristotelian *scientia* (I, Q. 1, A. 2). Despite the overlaps, Saint Thomas puts forward an altered theory. As such, Thomist *scientiae* need not fully fall within the bounds of Aristotelian *scientia*.

^{xiv} Both things accessed via either form of *scientiae* are contingent entities, the being of which requires explanation. Saint Thomas sketches the relationships between existence and caused things:

“Natural things are midway between the knowledge of God and our knowledge: for we receive knowledge from natural things, of which God is the cause... Hence, as the natural objects of knowledge are prior to our knowledge, and are its measure, so the knowledge of God is prior to natural things...” (*Summa Theologica*, I, Q. 14, A. 8).

From either mode of *scientia*, the contingency of the thing brings to the fore the knowledge extant prior to human apprehension of the thing. It may be argued that even in terms of knowledge of natural entities a position of faith needs to be held concerning prior knowledge of the entity’s existence. Thus, while the knowledge is demonstrable, it itself originates in an article of faith.

^{xv} Saint Thomas quotes part of Saint Ambrose’s attitude towards reason in the “*Exposition of the ‘De Trinitate’ of Boethius*”, however, it is worth returning to the primary text, wherein Saint Ambrose’s bias is illustrated against reason, and his position is conveyed in full:

“Away with arguments, where faith is required; now let dialectic hold her peace, even in the midst of her schools. I ask not what it is that philosophers say, but I would know what they do. They sit desolate in their schools. See the victory of faith over argument. They who dispute subtly are forsaken daily by their fellows; they

who with simplicity believe are daily increased. Not philosophers but fishermen, not masters of dialectic but tax-gatherers, now find credence” (Exposition of the Christian Faith, Book I, Ch. 13, §84).

^{xvi} The Aristotelian “Law of Noncontradiction” (*Metaphysics*, Book IV, Part IV), came to be held in the Thomistic theory that “*truth cannot contradict truth*” (Leo XIII, 1893). This is to be found in Aquinas’ argument against “The Double-Truth Theory”, expressed in *Truth*:

“If truth, then, is principally in the soul, judgements about truth will have as their criterion the soul’s estimation. This would revive that error of the ancient philosophers who said that any opinion a person has in his intellect is true and that two contradictories can be true at the same time. This, of course, is absurd” (Q. 1, A. 2 [2008a:9-10]).

According to Aquinas, the Averroist proposed just such an absurdity:

*“Through reason I conclude necessarily that intellect is numerically one, but I firmly hold the opposite by faith” (cited in Aquinas, *De Unitate Intellectus*, Ch. 5, §123, in McInerny, 1993:143).*

The text *De Unitate Intellectus* (“*On There Being Only One Intellect*”) sought to consider how Divine truths could not contradict the truths established by reason, and *vice versa* (McInerny, 1993:1). Now, for Aquinas, the Averroist is contradicting a fundamentally held law of logic, namely that of noncontradiction, in arguing that two contrary truths could both possibly be true (1993:212). There is no logical possibility that p could ever be argued to be equivalent to $\sim p$. Thus, for Aquinas, a truth value can never be contradicted by another opposite value which claims also to be true.

CHAPTER 4:

The boundaries of science

*“Philosophy is not one of the natural sciences.
(The word “philosophy” must mean something which stands above or
below, but not beside the natural sciences)” (Wittgenstein, 1922:44).*

4.1. Introduction:

In the last chapter, a redefining of science in returning to the Ancient Greek/Scholastic conception of “*scientia*” was proposed. Herein, scientific theoretical construals of the world as well as metaphysical considerations are accorded rightful honour. By this historical reconstructivist approach I reclaim *scientia* such that a continuum of knowledge is formed in which being and objects’ constitutive components can be studied. *Scientia* relocates the somewhat ignored consideration of ultimate questioning – like the problems of Creation and being – to the locus of the knowledge pursuit. In this manner, *scientia* is no longer solely a study of particulars, but of foundations. Therefore, a multimodal experience emerges because a one dimensional, highly specified scientific study is not acceptable for more complete knowledge of being. However, it must always be held in mind that *scientia* neither negates nor discounts the validity and findings of “hard” science, rather building upon these to better conceptualise being. Preceding arguments have illustrated the essential importance of including being in *scientia* for knowledge to be representative of the way things are.

From the research into re-abstracting science to *scientia* any characterisation of “*scientia*” determines the contents of that category. With the institution of a definition the limits of the category are established. Only that which falls within the perimeter of the category forms a part of it, and unavoidably whatever falls outside its bounds does not.

Dominant definitions of “science”, however, have tended to include only the empirically verifiable as sufficient to form the content of scientific theories. Immediately, the definition of science is limited to a corner of knowledge and is therefore a reductionist approach of the human experience of the cosmos; its understanding of experience is incomplete. The latter is certainly so in flourishing perceptions of science wherein all that is considered as adequate knowledge is the scientific. Chiefly present in such demarcations is the peremptory legacy of positivism, which is made more acute within scientism.

In this chapter, the appearance of science as an absolute source of reliable knowledge will be countered via an exploration of the limits of science. These become apparent by considering nature's relation to humans, the inability of the scientist to grasp reality objectively, and the restrictions on science imposed by its method.

Having argued that science is a limited enterprise, themes where "hard" science is limited in its explanations will be explored. Turning specifically to cosmology, the dual-fold nature of cosmology – as both scientific and philosophical – will illustrate that the conclusion of any satisfactory account of cosmological problems requires more than empirically verifiable science. Within cosmology the dynamic relationship that forms a continuum of knowledge between physical science and metaphysics is highlighted. For only in this continuum of knowledge can the problems of being and creation – themes present at every moment of existence – be considered. To do this, however, the re-conceptualisation of science as *scientia*, must be carried through in this study.

4.2. The legacy of positivism and contemporary scientism:

"If we take in our hand any volume—of divinity or school metaphysics, for instance—let us ask, Does it contain any abstract reasoning about quantity or number? No. Does it contain any experiential reasoning about matters of fact and existence? No. Then throw it in the fire, for it can contain nothing but sophistry and illusion" (Hume, [1748]2008:86).

Overwhelming empirical scepticism toward metaphysics is lucid in the Scottish empiricist, David Hume's work. His stance was a hallmark of the Enlightenment and became influential in scientific circles, as it later became manifest in positivism. Materialism, however, harkens back to Ancient Greece (Harré, 2012:11).ⁱ Positivism, though, only received its first major impetus in the nineteenth century, through the works of Comte, Mill and Mach (Harré, 2012:12-13). Whilst August Comte (1798 – 1857) is often credited with the coining of the term "positivism", its history can be traced into the sixteenth century writings of Francis Bacon (1561 – 1626) (Crotty, 1998:19).ⁱⁱ In this sense, "positive" refers to the "posited", that is, a statement which is the consequence of the sensory experience of the scientist through the scientific method rather than of cognitive abstraction (1998:20).

Comte embraced "positive science" to expose the order beneath the world, though not including metaphysical causes (Comte, [1896]2000:302, Crotty, 1998:22). Causes could not be empirically verified, instead – as the English philosopher Mill (AD 1806-1873)

explained of Comte's theory – knowledge could only arise from the experience of phenomena:

*“We have no knowledge of anything but Phaenomena; and our knowledge of phaenomena is relative, not absolute. We know not the essence, nor the real mode of production, of any fact, but only its relations to other facts in the way of succession or of similitude”.*¹

With its intense empiricist line, French positivism argued that meaningful knowledge was only gained through sensory experience (Harré, 2012:15).² Encouraged by the influence of French positivism, Mill sought additional support for the emphasis upon observationally obtained knowledge (Harré, 2012:16). He argued that errors are the result of reason, whereas more accurate evidence for any claim should be obtained from sensory experience (2012:17).³ In a comparable emphasis upon sensorily verified data, the Austrian physicist-philosopher Ernst Mach (1838 – 1916) removed metaphysics from science by redefining unobservable dimensions of physical theories, e.g. atoms, temperature, etc., in physical terms (Mach, 1960:267, Harré, 2012:20).⁴

Logical positivism – a movement from which the Vienna Circle (early 1920s-1938) to which Mach belonged – sought a firm grounding for the sciences, that included the excising of anything metaphysical (Weinberg, 1936:1, 6). For them, metaphysics was meaningless because its claims are not empirically verifiable, which is an approach that harkens back to Humean scepticism (Weinberg, 1936:1, Hume, [1748]2008:86). Now, although the positivists deemed metaphysics as meaningless, in this group it was really only Mach who conceptualised metaphysics as wholly insignificant (Weinberg, 1936:7).

The Vienna Circle's members emphasised observation's role in the identification of scientifically examinable patterns after the perception of multiple instances of singular

¹ Mill, 1865.

² *“The Positive Philosophy is distinguished from the ancient... by nothing so much as its rejection of all inquiry into causes... We have [thus]... sanctioned... that observed facts are the only basis of sound speculation... no proposition that is not finally reducible to the enunciation of a fact... can offer any real and intelligible meaning...”* (Comte, [1896]2000:302-303).

³ *“A knowledge of many laws of nature has doubtless been arrived at, by framing hypotheses and finding that the facts corresponded to them... [W]hile the thoughts of mankind have on many subjects worked themselves practically right, the thinking power remains as weak as ever: and on all subjects on which the facts which would check the result are not accessible, as in what relates to the invisible world, and even, as has been seen lately, to the visible world of the planetary regions, men of the greatest scientific acquirements argue as pitiably as the merest ignoramus”* (Mill, 1882).

⁴ Mach tried *“... to remove all metaphysical obscurity [within entities of theories of physics], without accomplishing on this account less than other definitions have done”* (1960:267).

phenomena (Carnap, [1966]2009:329-330). Observation, thus, became their beginning point for scientific activity ([1966]2009:330). After this, inductive inferences would be made to construct testable scientific theories. However, the Vienna Circle so relied on empirical observations, that – in a sense – science was reduced to sensorily experienced observations ([1966]2009:336-337).

Herein, though, lies the difference between the philosophical and the scientific grasp of “observation”. On the scientific side, the measured temperature of a substance, for instance, through the instrument of a thermometer is said to be observed ([1966]2009:337). However, the positivist philosopher would propose that the senses have not actually had direct observable experience of the exemplified temperature ([1966]2009:337).

“Empirical laws... are laws containing terms either directly observable by the senses or measurable by relatively simple techniques” (Carnap, [1966]2009:337).⁵

The positivist position is that what is articulated theoretically is not the direct product of observation by the senses, and thus, the referred theoretical entities cannot be measured empirically ([1966]2009:337). Included in theoretical, non-observable postulates are atoms, subatomic particles, and the like ([1966]2009:337).

Mach brought this line of thought to an extreme position: in the non-observable’s distance from the senses nothing was verifiable empirically, so the extra-subjective (mind-independent) reality – a metaphysical (i.e. meaningless) assertion – should be totally rejected (Weinberg, 1936:8). From the Machian paradigm, scientific knowledge was by necessity observed sensorily (Mach, [1910]1992a:118, [1910]1992b:137). Therefore, the sun – to use Mach’s own example – can be construed scientifically for it can be experienced by the senses ([1910]1992a:118). Indeed, it is apparent that Mach limits scientific knowledge to the subject’s own meso-level of experience.

“The non-experiencable has no conceivable sense and is absolutely undeserving of general (social) respect” ([1910]1992a:119).

⁵ The use of “*simple techniques*”, however, would obviously draw distance between the observed and the senses, even if only on a miniscule scale (Carnap, [1966]2009:337).

Scientific theories that postulated the non-sensorily experiencable, in the philosophical sense, were thus questioned by Mach ([1910]1992a:123). Included were the non-sensorily observable Galilean and Newtonian acceleration theories, and the hypothesis of the weight of an atom ([1910]1992a:123, [1910]1992b:137). Mach's rejection of atomic theory is extreme: he considered atoms as "*mysterious*" non-observables (1914:29). Mach held firm to his position on observation through the human senses that without any ambiguity he declared:

"... [P]hysicists *have nothing to seek 'beyond the appearances'*" ([1910]1992a:124).

What would "Machian metaphysics" – though he would deny the concept – look like, if his epistemology is so subjectively bound? He provides us with the answer:

"... [T]he world consists only of our sensations. In which case we have knowledge only of sensations" (1914:12).⁶

Mach's concluding position is that any non-observable theoretical construct or entity is utter fiction (1914:29). Maxwell, however, could not accept Machian instrumentalism: it is incongruent with the actual practice of science wherein science is not bound solely to observables ([1962]2009:451). Maxwell understood the key issue to be the identification of the division between sensory experience and sensory non-observables ([1962]2009:453).

"... [I]f this [positivist] analysis is strictly adhered to, we cannot observe through... ordinary spectacles, and one begins to wonder what we see through an ordinary windowpane" ([1962]2009:453).

The person who requires spectacles to clearly view the world does indeed behold one quite different to the ably sighted person: a tree can be perceived as a green mass, but with the aid of spectacles (or for the ably sighted), as an identifiable tree, with clearly defined leaves, etc. Either way, the person reliant on spectacles depends not solely on her senses to make the observation. So where does sensory observation cease to be sensory? ([1962]2009:453) If the spectacles are acceptable for observation, then as a logical consequence, would a powerful electron microscope also be acceptable as a tool

⁶ A tautology is evident: For Mach, all we can have knowledge of is sensation because the world is only comprised of our (human) sensations.

to aid observation in establishing the existence of atoms and other non-solely sensorily observables?

A further consideration contrary to Mach – which has been expanded upon in previous sections of this work – is the value-laden nature of human sensory perception. Nothing observed, perceived, and theoretically constructed through cognitive processes is done without removal from the *thing-in-itself*.

Other members of the Vienna Circle strengthened the proposition that the only valid knowledge of reality was obtained through the empirical scientific method (Crotty, 1998:24).⁷ Theirs was *the* scientific worldview, as conceptualised in the Vienna Circle’s own manifesto – “*Wissenschaftliche Weltauffassung: Der Wiener Kreis*” – that reveals their total trust in the scientific (Richardson, 2012:391, Neurath *et al.*, 1929).

*“Die wissenschaftliche Weltauffassung ist nicht so sehr durch eigene Thesen charakterisiert, als vielmehr durch die grundsätzliche Einstellung, die Gesichtspunkte, die Forschungsrichtung... [H]ieraus entspringt das Suchen nach einem neutralen Formelsystem, einer von den Schlacken der historischen Sprachen befreiten Symbolik... Sauberkeit und Klarheit werden angestrebt, dunkle Fernen und unergründliche Tiefen abgelehnt... Alles ist dem Menschen zugänglich; und der Mensch ist das Maß aller Dinge” (1929:305).*⁸

For the logical positivists, any scientific claim must be verifiable by the scientist, if not, it cannot be demonstrated through the senses and therefore it cannot be considered scientific (Crotty, 1998:24-25).⁹ This verification is achievable in two ways: via tautologous analytic statements where the scientific statement is in accord with the definition of the entity or through synthetic statements – in which the scientific inference is not contained in the definition – verified by sensory experience (1998:25).

⁷ Logical positivism was influenced by the empiricist, positivist, and logical traditions of Philosophy (Blumberg & Feigl, 1931:281).

⁸ The English translation of the German text is:

“The scientific conception of the world is not so much characterized by its own theses, rather than by the general attitude, the factors which direct research... [F]rom this springs the search for a neutral system of formulas, liberated from the dross of historical symbolic languages... Neatness and clarity should be sought, far dark and unfathomable depths rejected... Everything is accessible to the human, and human is the measure of all things.”

⁹ “... [A]ll knowledge is based upon experience” (Blumberg & Feigl, 1931:282).

The positivist determination of the scientific is clear: only the empirically verifiable may be included. As unverifiable in sensory terms, the disciplines of aesthetics, metaphysics, ethics, etc., are to be purged from knowledge acquisition for the sake of empiricism (1998:26).¹⁰ The only dimension of knowledge which has meaning to the logical positivist is “... *what must be the case if the proposition is true...*”, established as true by empirical verification (Blumberg & Feigl, 1931:287). Therefore, the proposition adequately represents the entity or it does not.¹¹ It is a clear-cut case. Science, for the anti-metaphysical logical positivists was pitted against metaphysics, because – as grounded in the non-empirical – the latter was confounded by intuition and “knowledge” of the sensorily transcendent (Ayer, [1936]1990:13, Richardson, 2012:394).¹²

“The criterion which we use to test the genuineness of apparent statements of fact is the criterion of verifiability. We say that a sentence is factually significant to any given person, if, and only if, he knows how to verify the proposition which it purports to express – that is, if he knows what observations would lead him, under certain conditions, to accept the proposition as being true, or reject it as being false” (Ayer, [1936]1990:16).

The literal being of metaphysical propositions is not located in the world of empirical verifiable propositions (1990:27). Thus, Ayer accuses metaphysicians of creating a world where their statements can reside safe from the criteria of empirical verification (1990:27). In this way, metaphysics is protected from any attempt to thwart it by positivist science.

The extremity of Ayer and Mach’s anti-metaphysics is astounding. More so if one considers that the peculiar task of metaphysics in philosophy is to conceptualise all reality, which is not of a “world” safe from the Ayerian-perceived attack from science.¹³ For realist metaphysicians this is certainly not the case. In particular, the Thomist realism earlier advocated for is a product of sensory experience of the natural world: it is natural philosophy.

¹⁰ “By means of the theory of knowledge thus constructed, logical positivism goes beyond the Comtean and pragmatic rejection of metaphysics as useless or superfluous and shows that the propositions of metaphysics, in most senses of the term, are, strictly speaking, meaningless” (Blumberg & Feigl, 1931:282).

¹¹ “... [T]he meaning of propositions is identical with the conditions of their verification” (Blumberg & Feigl, 1931:293).

¹² “Surely from empirical premises nothing whatsoever concerning the properties, or even the existence, of anything super-empirical can legitimately be inferred” (Ayer, 1990:14).

¹³ “... [T]he first and most important problem of philosophy is: To give a general description of the whole universe” (Moore, [1953]2002:2).

The positivist assertion of metaphysics' uselessness, meaninglessness, and nonsensicality, is itself a metaphysical assertion proper. Positivism makes claims concerning the nature of reality, such as those made by Mach, i.e. that the nature of the real is sensory (1914:12).¹⁴ Moreover, to hold its ground logical positivism needed to prove that there was no metaphysical system of any use or meaning (Feibleman, 1951:55). But, this required the embracement of a metaphysic meaningful for the positivist.

Moreover, verificationism – the positivist replacement for traditional metaphysics – is defective. The logical empiricist, Hempel brought this to attention (1950).¹⁵ Hempel critiqued the absolute need for verification of the early logical positivists. He deemed the placing of a prerequisite upon a statement that to be meaningful it had to be entirely empirically verifiable through sensory experience as a practical impossibility (Hempel, 1950:43-44). A case in point is that no laws of nature could be included as scientifically meaningful for the logical positivists as no universal extrapolation of particular observations could be absolutely confirmed “... *by any finite set of observational data*” (1950:46). Despite this philosophical issue – grounded in the employment of induction by the logical positivists – the positivistic spirit of absolute confidence in the scientific method to accurately represent knowledge of how things are has imbibed the worldviews of many scientists and has entered the understanding of many non-scientists (Crotty, 1998:26-27). Science benefits from retaining its image as objective, value-free, and a reliable demonstrator of the way things are in the physical and natural world. It is not the flawed construction of a scientist! The development of quantum mechanics, however, has gone some distance in critiquing the infallibility of science (Crotty, 1998:30).¹⁶

Philosophers of Science may also criticise the faith placed in science by some famous contemporary scientists like Dawkins, Hawking, etc., as I have illustrated in previous chapters.ⁱⁱⁱ These scientists have both immense popularity and influence, thus colouring the manner in which many from outside the academy understand the method of science: objective, trust-worthy, and uncontaminated.¹⁷ This “scientism” is an approach to science

¹⁴ “*Logical Positivism... contains statements of a metaphysical character. ‘Metaphysics is nonsense’ is metaphysics*” (Feibleman, 1951:59).

¹⁵ 1905 - 1997.

¹⁶ In particular the critical impact of Heisenberg and Bohr on scientific methodology (Crotty, 1998:30).

¹⁷ “[I]t may be that humanity will never reach the quietus of complete understanding, but if we do, I venture the confident prediction that it will be science, not religion, that brings us there. And if that sounds like scientism, so much the better for scientism” (Dawkins, 2003a:66).

with many overlaps to the empiricism and verificationism of positivism. Scientism's historical development is bound up with positivism, for there are hints of scientism in their shared history from the Greek Atomists, through Hume and Ayer (Almeder, 1998:2).

As a materialist metaphysic, scientism asserts that only nature has being (Haught, 2006:4). If there is only nature, then only empirical knowledge acquisition is to be considered valid (Almeder, 1998:1). Hence, it is only through the scientific method that claims to truth can be made, providing humanity with all the information required to conceptualise the cosmos (Haught, 2006:5, Loughlin *et al.*, 2012).

But, "science" is not "scientism". The former is a noble enterprise whereby through observation, reason and testing the physical and natural worlds are tentatively made better known to humanity in accord with the tools and abilities of scientists. The latter is not the practice of science. Scientism transcends the data and interpretations of science by making the metaphysical assertion that science alone is the absolute measure of valid knowledge (Haught, 2008:6, Giberson & Artigas, 2007:40).¹⁸ Scientism is an all-encompassing, unfalsifiable position. From a Popperian viewpoint it can be labelled as "unscientific": regardless of the evidence, scientistic thinkers can readily categorise the counterargument proposed as "unscientific" in claiming that science can account for everything.¹⁹

"Fortified by the success of science... we can discover in nature alone the sufficient explanation of everything. Life can be completely broken down into chemical terms. Mind is the outcome of natural selection (Cziko). Language (Pinker), ethics (Ruse and Wilson) and even religion (Hinde, Boyer, Atran) can be understood fully in naturalistic terms... [N]atural causes provide the final explanation of everything, including intellectual, ethical and religious phenomenon" (Haught, 2008:14).

The great scientific hope of a theory encompassing all there is to know – available through the scientific method – is reductionistic in its minimisation of multiple levels and facets of knowing to only one. Consideration of the multifaceted nature of the cosmos, the complexity of the *homo sapiens sapiens* existent – as far as we know – on this small planet in one solar system, and the falsifiable nature of science, brings the omniscient

¹⁸ "The claim that there is no valuable knowledge outside science certainly cannot be supported from within science... When we reflect on science—its aims, its values, its limits—we are doing philosophy, not science" (Giberson & Artigas, 2007:40).

¹⁹ "Complete knowledge is a tempting pie in the sky... It is the hallmark of many varieties of pseudo-science... These stories leave nothing out: they have an answer for everything" (Barrow, [1998]2005:3).

expectation of scientism back to finite reality.²⁰ It is undeniable that the scientific method successfully locates truths, but it is also true that at times science is limited, bounded, and fallible, thus it is unable to adequately account for every possible aspect of the real.²¹

4.3. The limits of physical and natural science:

“[A] fabulous engine called the Scientific Method harvests evidence through observation and experimentation, discards subjective, error ridden chaff, and delivers objective, veridical residues from which to spin threads of knowledge. Unfortunately, that engine is literally fabulous” (Bogen, 2002:128).

4.3.1. *Defining “limits”:*

Positivist and scientific assuredness in science presumes that the scientific project is a limitless initiative; through its evolving method, all things will come to be known. But, as a singular explanatory dimension of the human encounter with extra-human reality, science is both a created and bounded attempt to capture aspects of reality.²² Science’s limits emerge from the capabilities of the generator of science, the human, from what nature allows to be investigated, and from the method and tools of science (Barrow, [1998]2005:249). Here then science’s explanatory scope will be defined and the limits of scientific practice will be articulated.

The border of science lies at the point of encounter of the scientifically knowable and unknowable, i.e. wherever the scientific method is impeded by inability to venture beyond its explanatory power ([1998]2005:1). When scientific knowledge is held, the perimeters of that knowledge delineate the presently scientifically known and unknown. As timeously and humanly bound, though, science’s explanatory scope is limited. The tentative nature of science – that all its statements are never final and absolute – demonstrates this limit.

²⁰ *“An enlightened trust in the sovereignty of human reason can be every bit as magical as the exploits of Merlin, and a faith in our capacity for limitless self-improvement just as much a wide-eyed superstition as a faith in leprechauns”* (Eagleton, 2009:89).

²¹ *“... [S]cientism... has potentially destructive implications for many of the rich and diverse sources of knowledge that form our human, cultural, religious and intellectual heritage, and ultimately for the ethical and social structures required for any meaningful scientific practice within society”* (Loughlin et al., 2012).

It is unable, for instance, to account for the causal connection between a particular phenomenon and the resultant cognitive experience in the human, that is aesthetically pleasing (Flynn, 2000:83).

²² *“The idea that some things may be unachievable or unimaginable tends to produce an explosion of knee-jerk reactions amongst scientific (and not so scientific) commentators. Some see it as an affront to the spirit of human inquiry... Others fear that talk of the impossible plays into the hands of the anti-scientists...”* (Barrow, [1998]2005:248).

The best predictive inference made by a scientist is, hence, always subject to factual countering.

Amid the earliest articulations of a limit to scientific knowledge appeared in the work of Kant (Barrow, [1998]2005:69).²³ Kant defined the difference between “limits” and “boundaries”, presenting a realistic account of the evolving nature of scientific knowledge when it constrains itself to its peculiar realm:

“... [B]oundaries *always presuppose a space existing outside a certain definitive place, and enclosing it; limits don't require anything like that, but are mere negations, indicating of some quantity that it isn't absolutely complete*” ([1783]2007:62).

In the Kantian conception, science is bounded by what it can competently explore, making the boundaries of science impermeable by other modes of knowledge acquisition. On the other hand, science is limited to what is currently demonstrated. Limits are malleable, altering as science develops better theoretical constructions of dimensions of the real within the bounds of the scientific method's explorations.²⁴ In terms of the potential content of scientific theories – not their explanatory competence – though, Kant argued that “... *boundaries... are inconceivable...*” ([1783]2007:62).²⁵

Kant's distinction between limits (of current science) and boundaries (of the scientific method's explanatory ability) is useful. It emphasises that though science is a powerful source of knowledge of how reality is, it is also not an all-encompassing source. There are aspects of reality that fall outside science's coverage, that is, which it cannot explain. But, in what sense could science be bound given Kant's conviction in the explanatory power of science to grow in perpetuity? He argued that science refuses to acknowledge that there is anything it cannot stretch its grasp to, in terms of what its method explains:

²³ cf. Immanuel Kant's “*Prolegomena to any Future Metaphysic that can Present itself as a Science*” (1783).

²⁴ The cosmological and biologically evolving context within which objects of scientific study exist implies that scientific theories need always to be catching up with the changing nature of the cosmos for theories to be at the cutting edge of evolution. As Rescher explains, “... *no matter how far science advances, there is yet further work to be done...*” (1984:48).

²⁵ “*In mathematics and in natural science human reason recognizes limits, that is, recognizes that its inner progress will never be complete; but it doesn't recognize boundaries, i.e. it doesn't recognize that outside it there's something it can't ever reach*” (Kant, [1783]2007:62).

“In mathematics there’s no end to the enlargement of our insight or to the new discoveries that may be made; similarly in natural science, there’s no end to the discovery of new properties of nature, of new forces and laws, through continued experience and unification of it by reason. So these sciences are never complete, which means that at any time they have limits” ([1783]2007:62).

Herein we have some insight into the Kantian distinction. A limit is a malleable position which alters as science develops and comes to better theoretically construe knowledge. On the other hand, a boundary is a division determined by what the scientific method is capable of exploring.

Despite the Kantian delimitation, neither positivist nor scientific proponents give sufficient accord to the temporal limits of science by advocating it as the sole source of knowledge. Kant in effect forewarned that despite science having the explanatory ability to advance, it is never absolute and certainly never reaches perfection in its construals. Giving authority to the method of science – which it undeniably should be granted – Kant continues:

“... [T]hese limits should not be misunderstood—i.e. should not be thought of as boundaries—for mathematics bears only on appearances, and so it has no dealings with anything that can’t be an object of sensible intuition, such as the concepts of metaphysics and of morals, which means that it has no dealings with anything that could be a boundary for it. Mathematics can never lead to such things, and has no need for them. So there is a continual progress and approach towards completion in these sciences, towards the point or line, so to speak, of contact with completeness” ([1783]2007:62).

Thomism, though – in comparison to the Kantian – is of greater nuance, for it conceives knowledge as a continuum. Thus, instead of different modes of knowledge acquisition remaining in bounded isolation from one another, multiple dimensions of being are able to be addressed. For instance, science addresses the explanations of the evolution of an entity, whereas metaphysics would pose the question of that entity’s ultimate existence. Whilst the integrity of the various sciences is upheld – as per Kant’s proposal – a holistic image of knowledge is also able to be structured. Both mathematics and metaphysics meet in the multifaceted entity which can both be explored by mathematics and metaphysics, though from different perspectives.

With Kant, agreement is met in that the boundary of a particular science lies in what transcends the explanatory ability of any particular science.²⁶ It is not for the biologist to validly dabble in quantum mechanics, nor the chemist to make metaphysical assertions. The integrity of each science must be upheld and honoured, by virtue of its bounds. Thus, if one was to ask a metaphysical question about the foundation of being, a scientific answer should not be expected. Indeed, whilst the solution to the problem requires recourse outside of “*retrospective causality*”, “hard” science can only respond in causal terms (Rescher, 1984:10). Only by maintaining their independence will each scientific discipline progress. But it is not implied that the various disciplines should not be brought into dialogue. Indeed, it is in such dialogues of knowledge that a re-imagining of the project of science as *scientia* is arrived at. More complete knowledge is possible when the physical and the meta-physical meet. Therein, the boundaries between the sciences are pushed into an encounter which realistically touches on being in both its metaphysical (universal) and physical (particular) dimensions in beings.

4.3.2. ***Varieties of limits of physical and natural science***

The digression into the boundaries of the sciences has drawn attention away from the limits of the scientifically accountable. There has been considerable research into the limits of science in terms of particular sciences’ content. This has highlighted the tentative nature of science as a spatio-temporal construction of reality in an ever-expanding and changing cosmos.

4.3.2.1. Natural limits of science:

Science begins in nature, the first limit upon the thinking subject that encounters the real, questions it, and then generates theoretical constructions that attempt to describe it. The nature of the world limits the possibility of the scientist to grasp the investigated object. Indeed, everything material has its being within a cosmos in a continual state of flux in the time-space continuum. At no discrete moment is the cosmos ever the same in time and space. Moreover, biological evolution extends the greater epic of ever-emerging reality from the cosmic into biological history and human consciousness.

If it is an historical fact that being is located within cosmic and biological evolution, then the scientific study of all entities must always be a step behind the evolving cosmos.

²⁶ “*It clearly makes no sense to ask of [a] science what is in principle impossible*” (Rescher, 1984:10).

Scientists may be able to tentatively induce certain postulates about entities in the future, but they cannot certainly deduce based upon past experience into a changed present and a changing future.

“Can science explain everything – can it possibly answer all of our questions about the natural order of things? Can it ever fully accomplish its mission and bring its work to completion?” (Rescher, 1984:6).

Given the changing nature of the cosmos, the context of scientific study, and the particular evolving object of our cosmological focus, science will never be complete. All questions cannot be answered because the objects of concern are always developing, and the information from those objects is billions of years old (Barrow, [1998]2005:157).²⁷ Scientific explanation will hence be a continual part of the human attempt to make sense of changing reality as long as the time-space continuum continues its expansion.

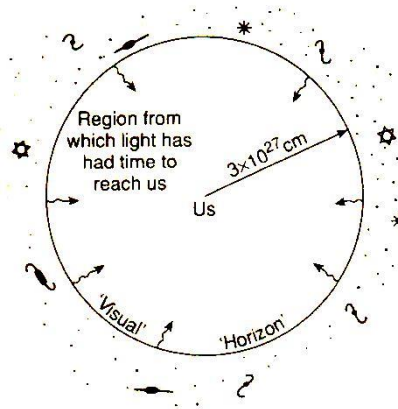
The core scientific concern of this study is cosmology, since it is the particular field of scientific exploration which overlaps with the philosophical “problem of creation”. Cosmology is concerned with points of origin, with the dynamic development of the cosmos, and with its future. Precisely because the first moments of cosmic evolution are its object, scientific cosmology enters the sphere of philosophical cosmology wherein speculation regarding both change and creation must occur.

Cosmology is a science different to other physical and natural sciences, however. Its object is not any singular dimension of material reality but the whole of it.²⁸ But, with the grandeur of the cosmological enterprise emerges acute limits to the knowable by the cosmological scientist. Finding herself in a tiny location in the cosmos, the cosmologist is limited to what she can observe. Furthermore, theories are not yet sophisticated enough to adequately image cosmological dimensions and workings. It is also so that the instruments employed are not yet able to grasp the reality unearthed.²⁹ Cosmology thus illustrates the limited nature of human-generated science in drawing out that scientists’ observations that can only be of a miniscule part of the cosmos (Barrow, [1998]2005:159).

²⁷ *“The Universe is expanding; so looking backwards in time requires us to contemplate times when the Universe was hotter and denser than it is today”* (Barrow, [1998]2005:157).

²⁸ *“When we look at astronomical objects, like stars and planets, we can take the outsider’s view, but when it comes to the Universe as a whole we cannot get outside it: we are part of the system we are trying to describe”* (Barrow, [1998]2005:155).

²⁹ *“No branch of science extrapolates so far into the unknown, and no line of human inquiry is more at risk from limits of all sorts”* (Barrow, [1998]2005:155).



2 Barrow's graphic representation of the limited nature of scientific cosmology's observation of the cosmos as a whole ([1998]2005:159).

From a central position the cosmologist is able to observe, measure, and develop findings founded in her study. However, she can only do this from the limited perspective of her embodied state. Thus, the problem of induction becomes relevant. From particular observations of the universe, the cosmologist cannot generalise observations to the entire cosmos (Barrow, [1998]2005:159). Through instruments of observation, the cosmologist has been able to increase the observable, but there is an horizon past which nothing can be observed ([1998]2005:160). Beyond the horizon of information provided by the Cosmic Microwave Background Radiation (CMB) lies the heart of cosmological study: the events of the initial singularity. But, because the visible universe's horizon of observation is presently not crossable, no falsifiable hypotheses regarding the first moments of the universe in its current form can be put forward (Barrow, [1998]2005:160). To generalise current observational knowledge to the whole cosmos, the cosmologist would have to postulate the unverifiable: that the universe has uniformity and is identical to the constrained universe currently observable ([1998]2005:160).

A further natural limit arises from the inflationary nature of the cosmos ([1998]2005:164). According to inflationary models of the universe, there was a brief period of inflation of space and time at an accelerated rate after which that field decayed so the expansion rate could return to its normal rate ([1998]2005:164).³⁰ The expansion of this particular region of the universe from a tiny entity enabled physical processes to remain smooth, as

³⁰ Recent support for the inflationary period after 10^{-32} seconds post the initial singularity has emerged from the Planck space telescope of the European Space Agency (ESA) (Peplow, 2013). Out of the inflation of miniscule fluctuations, matter emerged which produced the celestial bodies evident today (Peplow, 2013, Silk, 2009:38).

evidenced by CMB ([1998]2005:167). This radiation – almost totally uniform temperature in the sky – shows the regularity of the observable universe ([1998]2005:167).

As there was decay after inflation, information about the time prior to inflation (including the original moments) is removed! ([1998]2005:168-169) Nature thus creates a true boundary at the horizon of the observable cosmos beyond which the cosmologist cannot proceed.³¹

A product of the initial singularity is the expanding nature of the universe within space and time (Barrow, [1998]2005:170). The expansion rate is critical: just more than the contracting force of gravity ([1998]2005:170-171).³² However, because the visible universe is bounded it cannot be ascertained whether the non-observable remainder of the universe is in a state of expansion ([1998]2005:171).³³ Cosmic open or closedness is thus an unknown ([1998]2005:170-171).

The inability of cosmologists to separate themselves from their object of study is a barrier. There are cosmological narratives that remain unknown and presumably important accounts that cannot be known. While the speed of light determines the visible subsection of the cosmos, beyond this horizon verifiable science is ignorant ([1998]2005:189).³⁴ Open or closed, part of a bubble universe or simply the one universe, expanding or on its way to a “big crunch”, the cosmologist is limited to what the cosmos enables her to know (Barrow, [1998]2005:189, Dewdney, 2004:2).

³¹ “Inflation acts as a cosmological filter. It pushes information about the initial structure of the Universe out beyond our present horizon where we cannot see it; then, it overwrites the region that we can see with new information” (Barrow, [1998]2005:169).

³² The Hubble constant – i.e. the current rate of expansion – is 67.15 km/sec/million parsecs, whereas gravity has a force of 10^{36} (Rees, [1999]2000:33, Peplow, 2013).

³³ “Even if we were to hit the final Big Crunch, we would not know how much of the rest of the Universe was sharing that fate” (Barrow, [1998]2005:171).

³⁴ Einstein demonstrated that the speed of light ($c = 3 \times 10^8$ m/s [in a vacuum]) is the determining factor in both how fast any body of matter can travel and the velocity at which information can be transferred (Dewdney, 2004:35-36, 56, Penrose, 2004:400). In gazing into the Universe, items are observed in accordance with how they were as many light years ago. That is, the light emitted from objects has taken many billions of years – correlative with the distance from the Earth that those objects are located – to reach the Earth. During the inflationary period, the expansion of the cosmos was greater than the speed of light (Steinhardt, 2011:39). Moreover, as the Universe continues to expand, the speed of light remains constant given Einstein’s formulation (Penrose, 2004:400). Thus, there is an horizon which exceeds the speed at which light can be brought into the observable Universe in order that cosmologists could have information about moments prior to inflation after the initial singularity.

4.3.2.2. Cognitive limits of science:

Bacon and his empiricist and positivist successors deemed the involvement of the thinking subject in the development of scientific theory as a distortion of the facts (Faust, 1984:25). Indeed, this “acognitivism” held that the facts of scientific data should be left to themselves (1984:25). However, science is the product of thinking subjects, a phenomenon that does not occur without human involvement. Therefore, it could be defended that the scientist was just a conduit through which “unblemished” data flowed from sensory experience (of the human) and came to be recorded (by the person) (1984:25).³⁵ Fundamentally, science is more than an objective exposure of nature (Rescher, 1984:54). It is the dynamic interaction between the objects observed and the subjective observer who processes, compiles, and draws conclusions from the resultant data, interpreting it in light of held information in a social context through cognitive processes (Rescher, 1984:54, Faust, 1984:28).

However, if the human mind is fallible then cognitive involvement at the core of doing science needs to be explored such that its limitations may enable scientists to become more aware of their inadequacies (Barrow, [1998]2005:90). The hypothesis that a single dimension of cognition – namely judgement abilities – is constrained was researched by Faust, who argued: “... *all individuals, scientists included, have a surprisingly restricted capacity to manage or interpret complex information*” (1984:xxv).

The cognitive processes enabling the engagement between the subject and objective reality are complex. Among these processes is filtering, by which observable data that is irrelevant to the particular study is blocked from consciousness (Faust, 1984:8). Moreover, the multitude of potential observations is immense: selection of relevant information founded in judgement must occur (1984:9). The removal of irrelevant complexities is not always possible, however, even with the assistance of technological advancements (1984:10). Judging the pertinent observational data is an ability required for science to proceed and develop, else it would be lacking in focus and weakened in its explanatory power.

But, cognitive judgement has flaws. Faust cites the following case study whereby a group of radiologists had to explore gastric ulcers for malignancy to exemplify the subjectivity

³⁵ “*Science, the cognitive exploration of the ways of the world, is a matter of the interaction of the mind with nature – of the mind’s exploitation of the data to which it gains access in order to penetrate the ‘secrets of nature’*” (Rescher, 1984:54).

and fallibility of judgement (1984:41). Seven markers for the presence of cancer were identified by the experimenters in conjunction with a gastroenterologist (1984:41). Each marker would form one of seven points on a scale of malignancy to be identified by the nine radiologists participating in the study (1984:41-42). The radiologists were presented with ninety six hypothetical, individual cases to study, but some of these were repeated such that the total number of studies reached one hundred and ninety two (1984:41). When the medians of the judgments of pairs of radiologists were compared, a correlation of 0.38 was identified, whilst when three radiologists were compared, a negative correlation resulted (1984:42). Granted, this is a singular study from one medical field. However, the results of these cases demonstrates the impairments apparent in human judgement among professionally trained practitioners of a science (1984:42). Why were there such differences present in the judgements made?

Bias was deemed as the primary reason for keeping science separate from human cognition by the Empiricists and Positivists (1984:25). In fact, bias has been an assumption behind much theorising around scientific theories throughout history:

“... [I]ntellectuals from Plato to Freud have viewed bias as contamination, blockage, or interference of higher intellectual processes by the lower-level human drives or processes, such as animal instincts or emotion” (1984:57).

Other studies into the sources of errors of judgement, however, lay less blame onto emotive prejudice and more accountability onto bad judgements and cognitive limits (1984:57-58). In the first instance, errors in judgement arise from a failure to employ modes of judgement, or an inaccurate use of these (1984:58). An example of this is when a judgement is made based upon what can be remembered about the issue to be discerned (1984:58). Memory is obviously a partially faulty source of judgement, coloured by brain attrition through the passage of time. Human cognitive limitations also impede human ability to make accurate judgements (1984:70). Amidst the evidence available from the judgement studies, of particular importance is the analysis of the correlation between accuracy of judgement and an increase in available information (1984:70).

“When performing complex judgement tasks, individuals seem incapable of properly weighting more than a few pieces of information” (1984:70).

So great is the difficulty for humans to correctly judge that when information increases there is no statistical improvement in correct judgement ability (1984:71). An interesting aside is that with more information there is a general increase in the belief by people that

they are better able to make accurate judgements! (1984:71)³⁶ According to Faust, the postulate for the impediment to judge large amounts of information accurately arises from an incapacity to compare and systematise large quantities (1984:72). The human is therefore better suited to utilise small amounts of information.

The findings must now be extrapolated to apply to the scientist. The similarities between the “ordinary” human and the scientist begin at the biological level: both belong to the same species. Because of that commonality, others follow. Both non-scientists and scientists attempt to reason in a logical manner to solve problems using inductive and deductive means (1984:85). In fact, the greater the commonalities of approaches to reasoning between scientist and non-scientist, the greater the chance errors in judgement made by non-scientists will overflow into those of scientists (1984:88). Scientists do make errors (1984:89). That scientific theories are disproved indicates this. Surely these errors are partially the product of current limits in cognitive ability. To a degree – because of the presence of errors – further scientific research is undertaken and better theories are produced to replace the erroneous ones.

An awareness of the performance of errors in scientific reasoning has resulted in practitioners engaging in “quality control” measures to allay flawed judgements from escaping a particular scientific community (1984:106).³⁷ However, reviewing the research of another or doing research collectively does not remove the limited ability to reasonably engage in scientific activity by cognitive incapacities (1984:106, 113-114). It would be realistic for scientific thinkers to accept that science is an enterprise impeded by the cognitive limitations of its producers:

“Our knowledge about the Universe has an edge” (Barrow, [1998]2005:252).³⁸

4.3.2.3. Methodological limits of science:

If science is limited in its co-construal by both human engagement and by the world, it should carry over that in itself it has limitations. In this section the limits of science by virtue of its method will be explored.

³⁶ Introspective judgements and self-awareness of limitations tend to be inaccurate (Faust, 1984:81).

³⁷ *“The population of scientists... contributes to the construction of a problem solution that is beyond the cognitive capacities of individual members by generating and testing far more permutations than would be possible by individual effort”* (Faust, 1984:113-114).

³⁸ The emphasis is the author’s own.

The methodical observations and theoretical constructions of science are limited to explore material entities (Medawar, 1984:81). Because of this essential limit, it is outside the bounds of the scientific method to explore more transcendent issues, that is, issues beyond science (meta-physics) (1984:82). Consideration of the standard model of the initial singularity, for example, attests to this.³⁹ Whilst scientific cosmology can explain how the Universe in its present form came to be out of the initial singularity, from a moment when time/space=0, science cannot consider any themes without the material (Russell, 2008:12). Though the scientific cosmologist may seek to ask the fundamental metaphysical question of why anything is, she cannot do so by employing scientific methodology. Without matter to be observed, tested, and theories verified by measurement against matter, science would be venturing into the unempirical.

Consequently, the problems posed by science must be limited to the scientific in nature, i.e. which either relate or – by proof – do not relate to matter (Medawar, 1984:86). A scientific problem and its resultant hypothesis would be considered as scientific if it fulfils the two criteria of pertaining to matter and being empirically verifiable by its correlation to matter (1984:86).⁴⁰

If a scientific problem is posed it should be assumed as solvable – in principle – through the method of science which has identified it (Rescher, 1984:112, 131).⁴¹ But, sureness in the ability of science to solve problems does not imply that science is an unlimited source of knowledge of how reality is.⁴² The evolving nature of the natural world and the changing nature of science imply that scientific knowledge is always in a state of growth towards accounts that better grasp the real. However, when it comes to problems that relate to science these must be dealt with from within science (1984:206). Science does not become the sole source of knowledge production and acquisition, however. It remains

³⁹ “The reasons for believing in an explosive origin to the universe came initially from a theoretical study of Einstein’s equation in a cosmological context, made by Alexandr Friedmann in 1922... Then, in 1929, Edwin Hubble made the remarkable discovery that the distant galaxies are indeed receding from us in a way that seemed to be implying that the matter in the universe was the result of a stupendous explosion” (Penrose, 2004:704).

⁴⁰ “... [A]ny state of science delimits the range of legitimacy of posable questions...” (Rescher, 1984:127).

⁴¹ “... [Q]uestions cannot at one and the same time qualify as authentic scientific questions and be such that their answers lie in principle beyond the reach of science” (Rescher, 1984:131).

⁴² “... [I]f every state of knowledge generates new and as yet unanswered questions, then we will never reach a position where all questions are resolved” (Rescher, 1984:113).

a valued resource, though. Science, hence, is limited exclusively to its particular realm within the knowledge economy (1984:208).

An exploration of the history of science indicates that scientific theories are transient, for with rises in understanding, technology, or alternate ways of looking at observation data, theories are oftentimes falsified because they hold incorrect construals (1984:83). In fact, history even holds a probable remonstration of current scientific theories: the likelihood is that they contain many falsities!

“... [O]ur science... consists largely, and even predominantly, of false beliefs, embracing various theses that we will ultimately come to see... as quite untenable” (1984:83).

Rescher’s position is a generalisation, therefore, there are counterexamples which could negate it.⁴³ However, it is a statement which catches attention and encourages reflection specifically upon the fallibility of science which throughout its historical evolution has comprised of theory disproved by the emergence of another that could later itself be disproved. Whereas the inductive fallacy is not sought to be drawn, examination of history does exhibit the tentative nature of scientific theories.^{iv} As such, absolute confidence in science requires moderation, for it is plausible that there are aspects to present scientific theories that will be proved incorrect in the future.⁴⁴

All scientific theories should therefore be treated with caution, for they are tentative, and never represent a totality of the way that the natural world is to the scientist (1984:87). Indeed, almost certainly, future generations will scoff at current theories, too (1984:87).⁴⁵

The only unchangeable dimension of science is that at its core is an attempt to systematically explore, articulate, and hypothesise about the way the physical cosmos is (1984:104). This commitment maintains the continuity of science throughout its historical development, and into its future.

⁴³ An instance from biological history is the *“Theory of Natural Selection”* of Charles Darwin (1809 - 1882), published in his celebrated, controversial work, *“On the Origin of Species”* (1859). Though evolutionary theory has witnessed considerable development through the past one hundred and fifty four years, the core of Darwin’s research – that all life has evolved from more primitive forms – remains.

⁴⁴ *“We have no alternative but to see our science as both incomplete and incorrect in some... respects”* (Rescher, 1984:86).

⁴⁵ *“We must recognize that ‘our science’ is not something permanent, secured for the ages, unchangeable. Our theorizing about the nature of the real is a fallible estimation, the best that can be done at this time...”* (Rescher, 1984:88).

But, the future is another boundary imposed upon science: it is limited in its practice to a study of only past and present effects. Neither the future scientific problems nor their theoretical solutions can be induced by current science (1984:97). Hence, science is doomed always to the present moment. The path that the scientific enterprise will tread in the future is not known, perhaps its limits and boundaries will be redrawn, its scope enlarged. In a pragmatic manner, the practice of science may readily abandon what has traditionally been its methodology for a new method that works to better fulfil the *telos* of the scientific project (1984:107). This has happened in the past, and may happen in the future. Science as historically part of philosophy to its delineation into multiple branches, may evolve in an altered form.

What is certain, however, is that the contemporary practice of science is limited by its existence as a human enterprise attempting to scrutinise and thus better grasp material reality. As a product of fallible reason and limited explorations by its limits to the empirical and to its boundness by time and science, science has margins. Essentially, its confines of scientific explanation – what it can explain at any particular moment – is determined by the natural and human limits that constitute science.

4.4. Boundaries of scientific explanation:

“... [S]cience does not make assertions about ultimate questions—about the riddles of existence, or about man’s task in the world. This has often been well understood. But some great scientists, and many lesser ones, have misunderstood the situation” (Popper, 1978:342).

The inquiry into the limits of “hard” science produces a fairly conclusive result: science is not unlimited in its inquiry; it is a confined and fallible pursuit of the human. Moreover, science is not absolutely objectivist in nature, for while objectivity is required for the scientific method, real entities are not revealed to the human as an inert transcriber utilising the scientific method. Furthermore, science’s bounded nature makes it unable to grasp the whole complexity of being.⁴⁶ It should be noted that the multi-layered human experience of existence – not exhausted by empirical and verifiable modes of knowledge acquisition – further confirms the thesis. Contrary to the empiricist and positivist traditions I have argued that science is a singular among many attempts at the description of the real.

⁴⁶ “We feel that even if all possible scientific questions be answered, the problems of life have still not been touched at all” (Wittgenstein, 1922:89).

In scrutinising objects a more profound problem than the superficial study of the way that object is, begs the question to the scientist. With each engagement between thinking subject and object – indeed, with each instance of the posing of empirical questions – the object beckons the subject to ponder that it is. In every moment of existence, the primordial metaphysical problem of being is present to the subject. As Kant acknowledged, there is no escaping metaphysics! ([1787]2010:38)⁴⁷

But metaphysical problems are not empirical. Particular extant items can be measured, verified, etc., through empirical means. But nothingness and the emergence of being itself cannot! (Medawar, 1984:88)⁴⁸ For the moment of the bringing forth into being to be verified, empirical knowledge of the metaphysical would be required. However, that is simply beyond the grasp of the method of science, understood in its limited form (1984:88).

Metaphysics is a problematic sphere. As unmeasurable and unverifiable it has been a haven for improbable musings! (1984:90) But, the problem of being itself does not dissipate, and the method of science cannot come to the aid of the explorer. Choosing to ignore the problem does nought. Attempting to find scientific, empiricist theories to account for existence merely pushes being further back from consideration. Science cannot cross its own methodologically created border and cannot adequately justify the existence of anything because the appeal to physical processes begs the question of the existence of the said processes!

“The existence of a... [boundary]... to science is... made clear by its inability to answer childlike elementary questions having to do with first and last things—questions such as ‘How did everything begin?’ ‘What are we all here for?’ ‘What is the point of living?’ Doctrinaire positivism dismisses all such questions as nonquestions or pseudoquestions...”
(Medawar, 1984:59).

Metaphysical problems require metaphysical answers. But these theoretical constructs may not be fanciful or unrelated to testable physical and natural science (1984:93). A

⁴⁷ “For human reason, without any instigations imputable to the mere vanity of great knowledge, unceasingly progresses, urged on by its own feeling of need, towards such questions as cannot be answered by any empirical application of reason, or principles derived therefrom; and so there has ever really existed in every man some system of metaphysics. It will always exist, as soon as reason awakes to the exercise of its power of speculation” (Kant, [1787]2010:38).

⁴⁸ “The metaphysical subject does not belong to the world but is a boundary of the world” (Russell in Wittgenstein, 1922:16).

metaphysic that will attempt to answer why anything is must be informed by the totality of research done into that thing.⁴⁹

4.4.1. **The “problem of creation”:**

The Analytic tradition understands that its “natural philosophy” has been usurped in totality by contemporary science (McMullin, 1969:29).^v The meta-discourse on science – i.e. considerations on the method, levels of objectivity, description, etc. – is undoubtedly reserved for “philosophy of science” (1969:29). But, given its rich tradition, is there still a philosophy that considers nature as distinct from both the observational practice of science and the meta-considerations of philosophy of science? (1969:29) Perhaps in posing this question, the limits and boundaries of empirical science are transcended in coherently enunciating a more inclusive system of knowledge that is both metaphysical and empirical.

Amid the tasks of the contemporary philosopher of science must be the integration of findings of empirical science into philosophy. Scientific theories pertaining to the evolution of carbon-based life, the emergence of consciousness, the evolution of the *homo sapiens sapiens*, the fundamental nature of matter (Newtonian, quantum and relativity theories, etc.), etc., influence worldviews and philosophical bids to grasp reality (1969:31). In this mode of doing philosophy of science, the starting point is not scientific theory, but rather the contents of these (reflective of the entities toward which they direct). Therefore, “hard” science is the beginning from which philosophical positions are clarified and reconceived in light of the most current scientific findings. Here is a return to doing philosophy which takes nature seriously; a “*philosophy of nature*” in the truest sense.

The foundation upon which this sort of philosophy of nature is built is that of scientific theories in tandem with the philosophical method (1969:32). It is philosophical reflection upon the content of science (1969:33). With this base, philosophy of nature is profoundly realist because this philosophy is of verified science (1969:54).⁵⁰

However, the bias against natural philosophy – but not all philosophy – is also present in some physical scientists’ work. In his 1977 work, “*Space and Time in the Modern*

⁴⁹ “... [I]n constructing an adequate world-view, use may be made not only of contemporary scientific theories, but also of broader metaphysical views” (McMullin, 1969:34).

⁵⁰ When, after adequately analysing their data, scientists query outside their method into causality, their “*basic science, at its most innovative, merges into philosophy*” (McMullin, 1981:181).

Universe”, the cosmologist Paul Davies – although neither a positivist nor a scientific scientist – for example, wrote:

“It is a striking thought that ten years of radio astronomy have taught humanity more about the creation and organization of the universe than thousands of years of religion and philosophy” (1977:211).⁵¹

Scientific cosmology is a relatively late comer to the corpus of knowledge, with its genesis in the twentieth century following the Belgian priest-cosmologist Georges Lemaître’s discovery of cosmological expansion:

“L’éloignement des nébuleuses extra-galactiques est un effet cosmique dû a l’expansion de l’espace...” (1927:58).⁵²

Lemaître’s theory was further developed and tweaked by Edwin Hubble with the hypothesis of galactic redshift in 1929 (Hubble, 1929, McMullin, 1981:178). Supported by the 1964 discovery of CMB by Penzias and Wilson, the discipline of cosmology as a theoretical construction of the nature and features of the cosmos in space-time was advanced via various cosmological models in accord with the observable evidence (Gamow, [1954]1998:57, McMullin, 1981:179, Penzias & Wilson, 1965:420, Rees, [1976]1998:82).^{vi}

Like other scientific endeavours, cosmology is bound and limited. Central to the problems of cosmologists is that its object is the milieu within which the cosmologist – and everything observable by the cosmologist – has her being. Thus, the perspective of the cosmologist upon the thing studied is limited to her perspective in the space-time continuum (Ellis, [1975]1998:119). A further difficulty in terms of the universe is that analogous reasoning cannot be used: there is no other universe observable by the cosmologist against which to compare this one ([1975]1998:119).

To “observe” the universe the cosmologist must infer certain assumptions ([1975]1998:119-120). In order to make inferences about distant objects within the cosmos, for example, cosmologists must assume that the same laws apparent in this

⁵¹ The insertion of emphasis is the author’s own.

⁵² Translation from the French:

“The remoteness of the extra-galactic nebulae is a cosmic effect of the expansion of space”.

“region” of the universe apply there, too ([1975]1998:120).⁵³ But there is no way to ascertain whether or not this is a valid assumption! ([1975]1998:120)

When scientific cosmological questions are posed, there are philosophical dimensions which inevitably occur. For instance, causality beyond the boundaries of cosmological exploration:

“A theory which suggests that our Universe started from an extremely compressed concentration of matter and radiation naturally raises the question: How did it get into that state, and what made it expand?” (Gamow, [1954]1998:68).⁵⁴

Moreover, cosmological theories are oftentimes loaded with philosophical language, employing terms such as “start”, “creation”, “origin”, etc. (cf. Gamow, [1954]1998:68, Davies, 1977:211, [1984]1998:237, 241, Hawking & Mlodinow, 2010:123). From a philosophical perspective, scientific cosmology is an intriguing exercise. The boundary between science and philosophy – as imaged by Natural Philosophers – is porous: an interconnection stands in most fundamental problems’ consideration.

“There is... no sharp-cut distinction between the ‘scientific’ and the ‘philosophic’... the ultimate unity between the two implied by... ‘natural philosophy,’ ought be recalled. What may appear ‘philosophic’ at one time may well turn out to be indisputably ‘scientific’ at another...” (McMullin, 1981:182).

But, cosmology remains primarily scientific rather than philosophical. The question: *“How did the universe get into the state that it was prior to the initial singularity?”*, demonstrates this, as it is a question of scientific cosmology. The onus is then on the cosmologist to ascertain the physical processes which have resulted in the universe being as it was at a particular juncture. But, for the Natural Philosopher the question is properly metaphysical. The philosopher should seek to postulate the reason(s) for the universe having being at all.

Attempts at determining the foundation of being go back through intellectual history, particularly to myths of creation (Womack, 2005:81). Among these we find those of Egypt, Babylon, and ancient Israel.^{vii} However, the first recorded philosophical – rather than mythological – attempts at determining ultimate causes and primordial substances were

⁵³ This is the “Uniformity Principle” (Ellis, [1975]1998:120).

⁵⁴ The emphasis is my insertion.

conceived by Thales of Miletus and later by Anaximander and Anaximenes (the Ionian cosmologists).^{viii} Reflection on primeval origins continues as humans ponder their being, however, from the twentieth century the tools of scientific cosmology have enabled much clearer, more accurate descriptions of the initial moments of this universe's existence. Despite terrific advances, scientific cosmology does not, however, demonstrate anything about the coming into being of the cosmos, which was the primary concern of the earlier cosmologists.

“The most fundamental question in cosmology, is, ‘Where did the matter we see around us originate in the first place?’ This point has never been dealt with in the big bang cosmologies in which, at $t = 0$, there occurs a sudden and fantastic violation of the law of conservation of matter and energy. After $t = 0$ there is no such violation. By ignoring the primary creation event most cosmologists turn a blind eye to the above question” (Narlikar, 1977:136-137).

Modernity's turn to the subject may have some part to play in the neglect of the problem of creative bringing into being. In this subjective revolution, humanity is relocated to a privileged cosmic position (as the understander), above the cosmos (the understood). Before the advent of Modernity, scientific activity pursued the cosmos and its being, and principally the ultimate cause of being.⁵⁵ For example, Augustine determined the act of creation as a bringing into being of time and space (McMullin, 1981:183).⁵⁶ The scientist Galileo in his musings on the coming into being of the cosmos declared that the universe – of necessity – required a cause which he defined:

“... [It is u]ncreated and eternal being, on whom all others depend, to whom all others are directed as ultimate end... the efficient cause of all existence in an unqualified way... who not only could, but actually did, create the world...” (Galileo cited by Favoro in Wallace, 1974:486).

Despite the Church's condemnation of his heliocentrism, Galileo did not abandon his theological attitude toward creation (Farina, 2003:14, Wallace, 1974:488). Interestingly, what may be reaped from the “Galileo-episode” is that philosophy and theology cannot function in isolation from the most robust scientific enquiry if they desire to be relevant (Wallace, 1974:489).

⁵⁵ “The problem of creation, which has largely disappeared from contemporary scientific discourse, was central to the scientific revolution. What modern scientists recognise as the only relevant relation – that between the knower and the known, man and nature – was understood three centuries ago as secondary...” (Davis, 1991:325).

⁵⁶ Augustine, *The City of God*, Book XI, Ch. 6.

The critical item of philosophical cosmology throughout its history has been the “problem of creation”, the interest, too, of pre-modern cosmology. In essence, this primordial and always present – coterminous with every thing’s being – problem, has its focus on the description of the reason(s) for the “... *primeval origin of matter*” (North, 1963:577). The content of the problem does not refer to the bringing about of matter following the initial singularity – the composition of matter from pre-extant entities – for example.⁵⁷ Instead, it is the *primordial* bringing into being of all things.⁵⁸

To postulate that being is created is to attempt to explain that all that has being in space and time has been brought into existence by the act of bringing into being, i.e. by a cause. Creation therefore must be the action of a cause existent outside of space-time, who brought space, time, and all that is within that continuum into being, rather than the intellectually unsatisfying alternative; an uncaused coming into being (McMullin, 1981:184).⁵⁹ If scientific cosmology can only investigate and make theoretical constructs within the space-time continuum, the postulation of causality outside of space-time is not within the bounds of scientific explanation (1981:184). Instead, the issue – while alluded to by some scientific cosmologists – is metaphysical (1981:184).

Amid the tasks given hard science is the exploration of changes in matter from one form to another, as a result of changes in chemical composition or state, among others. However, in the *Contra Gentiles*, Saint Thomas argues that the act of the “production of being” “... *is neither a motion nor a change...*” (II, Ch. 17, §1). Material motion or change can only occur once matter has been brought into being, or at least, subsists in being. These then may be understood as the actualisation of latent potential within a thing to become something different, already subsisting in matter which is created (II, Ch. 17, §2).^{ix} Prior to the emergence of the being of a thing – when there is no-thing – there is no possibility of non-being having the potential to move or change.⁶⁰

⁵⁷ “A really original totality could not come into being through composition. For that would make it a subsequent totality... [Instead, the ‘problem of creation’ suggests] a new foundation in a radical sense. The beginning of an original totality with its active potencies would be a moment of the creation...” (Erbrich, 2008:83).

⁵⁸ “... [C]reation is the production of a being” (Aquinas, *Contra Gentiles*, II, Ch. 18, §4).

⁵⁹ “To say of the horizon-event that it was the Creation is to explain it in terms of a cause, a cause which is outside the time-sequence since its action is what brings time itself to be” (McMullin, 1981:184).

⁶⁰ Regarding the possible potentiality of non-being, Saint Thomas argues that if a thing is not, there can be no potentiality at all (*Contra Gentiles*, I, Ch. 17, §3).

“... [B]efore being made, the creature is not” (*Contra Gentiles*, I, Ch. 19, §4).

“... [I]n the action which is creation, nothing potential pre-exists to receive the action... Therefore, creation is not a motion or a change” (Aquinas, *Contra Gentiles*, II, Ch. 17, §2).

From the epoch of Greek philosophy, scholars have attempted to demonstrate that creation did not occur.^x Some of these have been via appeal to either motion or change of matter, but they have not justified why the motion or change to which they appeal has existence.⁶¹ Moreover, reason is not provided for the being of the matter upon which the motion or change acts. However, theoretical constructions that incorporate the primeval act of creation do make account in drawing attention to “... *the very dependency of the created act of being upon the principle from which it is produced*” (Aquinas, *Contra Gentiles*, II, Ch. 18, §2).

The production of being cannot, however, be the result of a corporeal being (Aquinas, *Contra Gentiles*, II, Ch. 20, §1). A body extant in time-space may indeed make something from matter with existence in parallel to the maker (II, Ch. 20, §2,). But the matter on which the undertaking of making into something new occurs is not created by the maker.⁶² This makeable-into-something-new raw substance must pre-exist the act of making to be made. What sort of being could create, hence? If it could not be a maker from within the space-time continuum – for with the act of creation, time and space are produced – the cause of the production of being must itself be transcendent. But this hypothesis rises beyond physical and natural science, moving toward “*scientia*” informed by reasonable faith!

4.4.2. **Scientific challenges to the “problem of creation”:**

If the cosmos did not always exist in the sense that it was brought into being, the problem of creation begs for investigation. But, as Saint Thomas has convincingly argued, “... *creation is not a motion or a change...*” (*Contra Gentiles*, II, Ch. 17, §2). When scientists begin to explore the moment of the bringing into being of all matter it may be questioned whether they are exploring a sphere proper to themselves. Whilst the initial singularity was a change in matter from a primordial atom within a quantum vacuum (created

⁶¹ According to Saint Thomas, what he has argued regarding the creation “... *makes apparent the fruitless effort of those who impugn creation by arguments derived from the nature of motion or change...*” (*Contra Gentiles*, I, Ch. 18, §1). He adds that both motion and change do not emerge from nowhere but are also created aspects of the real (I, Ch. 18, §4).

⁶² “*Patently false... is the position of those who said that the substance of the heavenly bodies causes the matter of the elements; matter can have no other cause than an agent which acts by creating, for matter is the subject of motion and change*” (Aquinas, *Contra Gentiles*, I, Ch. 20, §7).

entities), the act of creation was not a change of material form. A confusion of terminology has emerged on the part of some physical scientists who use the term “creation” (and its associates) with the “Big Bang” (or the first moments – where proposed – of other cosmological models).^{xi}

Despite the appeal to science adequately accounting for the act of creation, each of the examples in the footnote makes an attempt to counter the need for the act through argument founded in “hard” science. Essentially, the “problem of creation” is side-lined – but not eliminated – by a loss of focus by the particular scientific research. This is not to imply that all cosmologists have taken a similar line. Bondi, for instance, thought that creation was a topic for philosophers (1961:143).⁶³ However, contra to Bondi, Grünbaum took severe issue with cosmologists who conceptualise the beginning in time of matter with the “problem of creation” (1989:373).⁶⁴ Grünbaum does have a valid point: the issue of the development of the cosmos through physical processes – “... *a temporal origin...*” – is different to the act of creation (1989:373). However, the latter question is not invalidated by the former. In cosmological research like that of Narlikar (1977), Grünbaum’s issue is further validated: scientific cosmology and philosophical cosmology are merged into one problem (1989:374).^{xii} The delineation between physical origins and creation is of essential importance for my discussion. Grünbaum conceptualises the emergence of matter-energy as a product of physical processes (1989:373). This is fair enough. However, physical processes which bring about changes in matter-energy in the formation of new entities, do not account for the being of these same physical processes. Even if such physical processes are the fruit of other physical processes (for instance, quantum fluctuations), why these have existence is a question that is not removed by physical processes. All that is apparent from the existence and action of physical processes is that they do exist. Once more, Aquinas has bearing: the initial singularity, and other physical processes, are reflective of changes in material-energetic form, rather than a coming into being. Hence, the study of these processes is rightly the stuff of physical cosmology, physics, etc.⁶⁵

⁶³ “... [T]he problem of the origin of the universe, that is, the problem of creation is... handed over to metaphysics” (Bondi, 1961:143).

⁶⁴ “... [T]he genuine problem of the origin of matter-energy or of the universe has been fallaciously transmuted into the pseudo-problem of creation by an external cause” (Grünbaum, 1989:373).

⁶⁵ “If the big bang theory... is true, it provides no support at all for... creation...”, for the “Big Bang” is not the act of the production of being (Grünbaum, 1989:376, Aquinas, *Contra Gentiles*, II, Ch. 18, §4).

In terms of creation, however, Grünbaum poses what he deems to be a severe challenge: the argument from creation is not scientific (1989:379). He articulates a general notion of creation:

“The physical universe as a whole had a beginning a finite time ago as a result of an act of creation out of nothing by a single, conscious external CAUSE or agent. And that external cause or creator is then claimed to be the personal God of the biblical theistic tradition” (1989:379).

But, Grünbaum has missed the point: creation is not a scientific appeal to explanation. Creation’s causality is not simply a sequence of events within time, as causation “in time” is *not* bringing into being.⁶⁶ So, Grünbaum argues analogously against creation, merging two notions of causality within and without time (1989:379). He develops a straw-man fallacy: the production of being (creation) and a natural occurrence within the creation are not the same.

“... [T]here are a vast number of cases of causation by physical forces and, more generally, of causally connected natural events in which no human or other conscious agents are involved. Earthquakes and the melting of snow or uninhabited mountain tops in the spring are causal chains of events, but no conscious agents are involved” (1989:379).⁶⁷

On the grounds of Grünbaum’s merging of the two notions of causality, the “problem of creation” is labelled as “pseudo-scientific”, produced through “... *illegitimate ways of begging the question...*” (1989:390). But, in Grünbaum’s estimation, the moment of creation is placed *within time* (1989:393).⁶⁸ But this is a problematic assertion. The level of his confusion over the problem is hence exacerbated, for creation is equated with the initial singularity, in as much as Grünbaum himself critiqued Narlikar (Grünbaum, 1989:374, Narlikar, 1977:125). This reading is not an assertion plausibly made by physical cosmology.

⁶⁶ Employment of the term “cause” when dealing with the “problem of creation” is contentious due to its vagueness and the ease of misconstrual. Saint Thomas’ “producer” may fit better (*Contra Gentiles*, II, Ch. 18, §4).

⁶⁷ The conventional argument contra an “uncaused cause” is offered by Grünbaum, too: if all things require a cause, then how is it possible for the primeval cause to itself not have a cause? (1989:383) But, if we are speaking about cause outside of time, the chain of causality could be obscured. Moreover, the earlier reference to “producer” rather than “cause” could once more have import.

⁶⁸ “*Why, I ask, should the transition from the vacuum state to the expansion require any external cause at all, let alone a divine one?*” (Grünbaum, 1989:393).

From within Quantum Cosmology, Paul Davies states that he knows what caused the initial singularity ([1984]1998:226).⁶⁹ It is an uncaused event emerging out of a cosmos that was “... *set up in just the right way at the onset*” ([1984]1998:229).⁷⁰ The initial “set-up” was the quantum vacuum; the primordial structure with the potential to bring forth any number of particles out of its fluctuations ([1984]1998:233-235).^{xiii} Out of the vacuum the expansion of the primordial particle occurred, such that in 10^{-34} seconds the universe doubled in size, continuing exponentially ([1984]1998:235). The cause of the initial singularity was the quantum vacuum ([1984]1998:235).

The glitch in this account, though, is that a description of how the quantum vacuum itself came to be in space-time is required ([1984]1998:241). One would expect that the quantum vacuum should have a cause ([1984]1998:241).⁷¹ However, Davies argues, in the quantum vacuum causality breaks down ([1984]1998:242).⁷² The escape route from causality is in petitioning towards the curious quantum realm: a dimension of material reality ([1984]1998:244). But, even so, explanation is required for the vacuum’s existence, for the very fact that it has being ([1984]1989:244). Hence, Davies argues:

“[I]f quantum theory allows particles of matter to pop into existence out of nowhere, could it also, when applied to gravity, allow space to come into existence out of nothing? And if so, should the spontaneous appearance of the universe 18,000 million years ago occasion such surprise after all?” ([1984]1998:244).

The “problem of creation” is pushed back once more from immediate answering, relegated to the historic chronicles of metaphysics! Gravity, the explanatory source exposed in the quantum argument, is itself a part of the material reality which makes up the cosmos. That it is an extant entity demands that gravity – while able to be the cause behind the emergence of the quantum vacuum out of which the singularity occurred – also requires

⁶⁹ “No force caused it to explode... it simply started with an initial expansion” (Davies, [1984]1998:227).

⁷⁰ Whilst acausality does feature in quantum mechanics, especially through seemingly random fluctuations within the quantum vacuum, these random events can only occur within the extant vacuum (Penrose, 2004:861-862, 868). Classical causality can therefore be bypassed within quantum events, such as in *Bell inequality violations* (2004:865). However, acausality does not account for the being of the quantum vacuum itself.

⁷¹ “It is certainly true that in the familiar world of experience objects usually owe their existence to other objects. The Earth was formed from the solar nebula, the solar nebula from the galactic gases, and so on. If we should happen to encounter an object suddenly appearing out of nowhere we should be inclined to regard the event as a miracle...” (Davies, [1984]1989:241).

⁷² “Physicists learned that at the atomic level matter and motion are vague and unpredictable. Particles can behave erratically, rebelling against rigidly prescribed motions, turning up in unexpected places without discernible reason and even appearing or disappearing without warning” (Davies, [1984]1998:242).

to be accounted for. The “problem of creation” is, therefore, not eliminated by appeal to the quantum cause of the “Big Bang”!

The theoretical postulation of a temporally bound universe has plagued many cosmologists due to the related assumption that causation in time must have a source, one that has come to bear theological undertones.⁷³ Einstein, we are told – via the memories of Lemaître – was among those who carried this assumption; upon Lemaître introducing the notion of the explosion of the “primeval atom” in conversation, Einstein declared:

*“Non, pas cela, cela suggere trop la creation”.*⁷⁴

Thus, it is conjectured that by removing the initial singularity the requirement for causality is removed. Scientific cosmologists have tried this through at least three cosmological models: those of eternal inflation, and the cyclical and emergent universes.⁷⁵ These models stand in spite of the singularity theorems of Hawking and Penrose.⁷⁶ Herein, it is proposed that the first moments of the universe in its present state necessitate the initial singularity at the beginning of the space-time continuum (Hawking & Ellis, 1973:364, Mithani & Vilenkin, 2012). With or without the initial singularity, whether in an eternally existing universe or a time-bound one, our problem does not disappear: there is existence!

There are other reasons for questioning the overwhelming acceptance of the standard cosmological model (Narlikar, [1981]1998:90). Among these is that the standard model does not explain why the primordial flaring forth occurred, nor whether there was any matter prior ([1981]1998:92). Eternal universe explanations on the other hand, avoid the

⁷³ Consider the following statement by Stephen Hawking which illustrates the point:

“So long as the universe had a beginning, we could suppose it had a creator. But if the universe is really completely self-contained, having no boundary or edge, it would have neither beginning nor end. What place, then, for a creator?” (1988:140-141).

⁷⁴ Einstein in conversation with Lemaître (1958:129), translated by Heller as:

“No, not this; this too much suggests the creation” (2000:667).

⁷⁵ Mithani & Vilenkin, 2012.

⁷⁶ Hawking & Ellis demonstrate that singularities need to be given credence because to claim causal breakdown is not an acceptable explanatory “loop hole” (1973:272). Their research into singularity theorems demonstrates, with a fair deal of certainty – founded in the background radiation – that “... there was a singularity at the beginning of the present expansion phase of the universe” (1973:348). It is philosophically notable that mention is made of the “present” state of the universe, for it is not verifiable to assert that there were past states in which the universe was in.

initial singularity and by so doing bypass awkward problems about *creatio ex nihilo* (which violates the law of energy conservation) (Gamow, [1954]1998:69, Narlikar, [1981]1998:92).

The eternal inflation cosmological model puts forward the thesis that the universe comprises multiple regions within an inflationary context.⁷⁷ In parallel with one another, regions inflate and new regions emerge: there is no future directed eternal limit to the numbers of possible regions that can come into existence.⁷⁸ If, however, the Universe is pictured as having no eternal limit in the future, would it be reasonable to assert that it is a “... *steady state of eternal inflation without beginning*”?⁷⁹ Multiple expanding regions of the universe would not appear to eliminate the necessity of the Hawking & Penrose singularity theorems, whereby all inflating regions would have singular points from which they inflate.⁸⁰ Thus, “... *inflation does not seem to avoid the problem of the initial singularity...*”⁸¹

Another cosmological model that utilises eternity to avoid the singularity is the “cyclic model” which takes issue with the standard model for inadequately articulating both the originating moments and the cosmos’ future (Steinhardt & Turok, 2002:1436). To avoid the description of the beginning and the end, the cyclic model hypothesises a cosmos caught in an eternal cycle of expansion and contraction through many singularities and many “crunches” (2002:1436). This model is related to – the as-yet unproven – “String Theory” (2002:1437). By virtue of its placement before and after the present form of the Universe, the cyclic model is proposed to be “... *a complete model of cosmic history...*”, a wide-ranging statement indeed! (2002:1439) Despite the beauty of the mathematical equations of the cyclic model, the empirical verification of a model that purports to determine the way the universe was prior to the current universe’s singularity or into the future relies on massive inductive conjecture! Moreover, the primordial problem of being remains: even if the universe has expanded and contracted in a cyclical fashion, why is it at all? Perhaps the most complete narrative of the cosmos is not that thorough.

⁷⁷ Borde & Vilenkin, 1994.

⁷⁸ Borde & Vilenkin, 1994.

⁷⁹ Borde & Vilenkin, 1994.

⁸⁰ Borde & Vilenkin, 1994, Mithani & Vilenkin, 2012.

⁸¹ Borde & Vilenkin, 1994.

In a bid to examine alternate cosmological models, Ellis & Maartens constructed a singularity avoiding model founded in inflation.⁸² The “Emergent Universe” model can be visually conceptualised as an eternally existing egg out of which is hatched a universe in expansion⁸³:

*“The inflationary universe emerges from a small static state that has within it the seeds for the development of the macroscopic universe, and we call this the ‘Emergent Universe’ scenario”.*⁸⁴

Ellis & Maartens argue that because the “egg” model originates in “Einstein static” there is no singularity.⁸⁵ But, in what sense is this “cracking open” – in analogical terms – different from the initial singularity occurring out of a quantum vacuum? The emergent universe too has a point of emergence, i.e. a beginning that required both energy and means to emerge.⁸⁶ Furthermore, the being of the emergent universe is not touched on.

In each of these “eternal” models, a period of “*past incompleteness*” existed in tandem with moments of emergence – beginning instants – for the universe to come into its current form.⁸⁷ Contrary to Mithani & Vilenkin, Susskind argues for the contrary view, namely that the universe did not have a beginning, that is, that it is not simply forward-eternal but “*past-eternal*”, too, with the caveat: “... *for all practical purposes*...”.⁸⁸ Do “practical purposes” measure up to the verifiability requirement of scientific theories? Nevertheless, Susskind has found that all arguments presented do in fact direct to a beginning, but that that beginning is “... *so far in the past that it is effectively minus infinity*”.⁸⁹ It is curious that Susskind insists that the beginning is of no consequence, despite the contradictory evidence. Choosing to “practically” ignore the beginning does not remove it. Moreover, the being of the universe remains glaringly apparent.

⁸² Ellis & Maartens, 2004.

⁸³ Mithani & Vilenkin, 2012.

⁸⁴ Ellis & Maartens, 2004.

⁸⁵ Ellis & Maartens, 2004.

⁸⁶ Mithani & Vilenkin, 2012.

⁸⁷ Mithani & Vilenkin, 2012.

⁸⁸ Susskind, 2012.

⁸⁹ Susskind, 2012.

Another meta-cosmological model that pushes the problem of creation away from answerability is “multiverse” theory. It has been argued that this theory conjectures to explain creation using metaphysics masqueraded as “hard” science (Scott, 2012:343-344).^{xiv} Nevertheless, in the past few years the “multiverse” has seen a rapid increase in popularity amongst scientists.⁹⁰

From the original moments when *homo sapiens sapiens* first became filled with wonder upon gazing up at the starry night, questions of beginnings emerged. This theme continues to be posed in cosmology, making it a discipline that is not only scientific, but deeply anthropological: it is the human pursuit to account for existence (Scott, 2012:347). Multiverse theory embodies the deep-seated link between the human asking how the cosmos emerged and why it – and all it contains – did so, for it narrates how humanity came to be in this particular universe (2012:347).⁹¹ This theory suggests that the universe in its current form could be one of many universes and our “Big Bang” a particular “singularity” in a myriad of primordial explosions (Rees, 1999:83).^{xv} Hawking & Mlodinow are certain that “... *many universes exist...*”, positing the actuality of approximately 10^{500} separate universes (2010:118-119, 136).⁹²

Because M-theory claims that there are a myriad of universes each with its own unique physical laws “... *it becomes inevitable that somewhere the right mix of circumstances will occur...*” for the emergence of carbon-based life in the immense system of universes (Hawking & Mlodinow, 2010:136, Ellis, 2007:289).

The viability of multiverse theory hinges upon the “real-ness” of the theory, i.e. whether there is evidence in support of it. Cosmic vastness demonstrated by the Wilkinson Microwave Anisotropy Probe (WMAP), makes the potentially knowable miniscule (Carr,

⁹⁰ Rees (1999, 2007), Carr (2007), and Hawking & Mlodinow (2010) are multiverse proponents. On the contrary, opposition has emerged from Ellis (2007) and Davies (2007), among others.

⁹¹ “... [M]any universes may exist, but only some would allow creatures like us to emerge, and we obviously find ourselves in one of that subset” (Rees, 1999:83).

⁹² The tentativeness of science guards against absolute declarations by scientists, more specifically towards those that are not supported by empirical evidence (Scott, 2012:346). Cosmological models do present unobservable theoretical entities, however. Both dark matter and energy, for instance, are claimed to exist by standard Big Bang cosmologists (2012:346). Due to the postulation of hypothetical entities, i.e. those that are not empirically provable, some cosmologists have warned against the Big Bang model (Lerner, 2004:20). That the standard model has been warned against, though, is still not grounds for acceptance of multiverse theory. A cosmological model should be comparable to observation – although they may be limited – rather than merely hypothetical as is the case with M-theory (Ellis, 2007:389).

2007:9).⁹³ Indeed, the human level of unawareness – even in terms of the universe within which we find ourselves – permits Rees to argue that asking whether universes that are not observable exist is in fact meaningful (2007:61). These sorts of assertions challenge the scientific method but seek to be scientific.

The inflationary cosmological model is closely tied to M-theory as both postulate the existence of other universes (Feeney *et al.*, 2011, Scott, 2012:351).⁹⁴ Thus, tests relating to the inflationary model can be utilised to discover other universes as M-theory proposes exist (2012:351). In their experiment, Feeney *et al.* sought to identify the effects of collisions on the Cosmic Microwave Background Radiation between this universe and others.⁹⁵ They assumed that such collisions would produce observable evidence in the form of azimuthal symmetrical imprints (Feeney *et al.*, 2011, Scott, 2012:351). However, this seven-year project revealed no evidence that any collisions between this universe and another had occurred.⁹⁶

“That no collisions were detectable does not falsify multiverse theory. The empirical tests on the data demonstrates that the hypothesis that the presence of ‘bubble universes’ by collisions between such universes is testable has been falsified presently. This research does not make multiverse theory unfalsifiable for no empirical evidence for the existence of multiple universes can be found yet” (Scott, 2012:351).

Without empirical evidence, however, multiverse theory remains outside the bounds of scientific demarcations: its hypotheses cannot be proven or disproven (Davies, 2007:495, Kragh, 2009:531).⁹⁷ In point of fact, the position that multiple universes do exist is founded in metaphysical assumption rather than observation: everything which possibly can exist (at least as a mental construction), is supposed to exist (Ellis, 2007:388, Krauss,

⁹³ “... [Cosmology’s limits are not bound to just] *the perceptible distance into space which astronomical apparatuses are able to probe... [but also] the horizon resultant of the distance able to have been travelled (at light speed) from the moment of the initial singularity*” (Scott, 2012:348).

⁹⁴ Expanding on the link between M-theory and the inflationary model, Hawking & Mlodinow analogously explain:

“Many tiny bubbles [universes] appear, and then disappear again... A few of these little bubbles, however, will grow large enough so that they will be safe from recollapse. They will continue to expand at an ever-increasing rate... These correspond to universes that start off expanding at an ever-increasing rate – in other words, universes in a state of inflation” (2010:136-137).

⁹⁵ Feeney *et al.*, 2011.

⁹⁶ Feeney *et al.*, 2011.

⁹⁷ “... [A]stronomers may never be able to observe the [postulated] other universes with telescopes and particle physicists may never be able to observe the extra dimensions with their accelerators” (Carr, 2007:14).

2012:126). By arguing for the multiverse without the support of observational data, the theory becomes an article of reasoned faith rather than a purely empirically founded cosmological model (Scott, 2012:353). An explanation for why all things came to be as they are is provided by appeal to created natural laws (2012:353).

However, in making declarations concerning the nature of reality, multiverse theory proffers metaphysical statements (Hawking & Mlodinow, 2010:10, 118-119, Scott, 2012:353).⁹⁸ This would not be a problem for the metaphysician, but for scientific scientists who lay claim to the integrity of their work as hard science alone, there is disingenuity! Where the metaphysician should take issue, though, is that the proposed multiverse metaphysics is unsatisfying in not adequately constructing an explanation as to why anything is at all! (Scott, 2012:353) Multiverse theory simply returns the problem of creation to the enquirer by positing physical laws, themselves unaccounted for in terms of being, as the source of all creation (2012:354).

4.5. Conclusion:

“... [The logical positivists and their historical followers] *are constantly trying to prove that metaphysics by its very nature is nothing but nonsensical twaddle—‘sophistry and illusion’...*” (Popper, [1934]2002:12).

Encountering the limited and bounded character of “hard” science offers a blow to the pervading Western image of this uncontaminated mode of human knowledge acquisition. In sum, the argument has here been presented that science is not absolutely objective; it is the product of the subjective human engaging with the cosmic milieu, thus limited in its own essence and mode of enquiry. Readers of popular science works should be cautioned of the positivist and scientific spirit abounding in so many of these, wherein absolute trust is placed in the method of science. Simply, science neither has access to all aspects of the cosmos nor does it have sufficiently sophisticated theories to explain all that scientific methodology enables the scientist to observe. Necessarily, if science is constrained in its explanatory power it can only be hypothesised as a semi-reliable source for attaining knowledge of reality. That scientific theory is tentative further supports this claim.

⁹⁸ “... [T]he authors themselves [Hawking & Mlodinow] cannot resist engaging in evident philosophizing about the nature of theories and their relationship to reality” (Haldane, 2011:4).

Amid the boundaries of science exposed in this chapter include the inability of science to transcend its method to deal with non-scientific problems. Of absolute importance is that while the term “creation” is oftentimes employed by physical scientists, I have argued that creation is not a change in physical form, but is the production of the being of the physical forms themselves. As there is no empirical data to be studied concerning creation, the transition from non-being to being is not a moment accessible by science. It transcends the possibilities of scientific methodology and explanation. Nevertheless, some physical scientists (e.g. Hawking & Mlodinow [2010] and Krauss [2012]) persist in seeking to employ theories of physical science as passable solutions to presenting metaphysical problems like those of being and Creation. However, the employment of the quantum vacuum (existent nothingness) and/or multiverse theory in this regard fail to account for why there is anything in existence at all, as well as ignoring the glaring problem of their own being! Despite attempts to remove the philosophical problem of creation from discourse, being is always before the scientist, presenting itself to humanity at every historical moment.

Therefore, the primordial metaphysical question remains, and demands consideration:

“Why is there something rather than nothing?”

The evidence available from scientific cosmology of the earliest times undeniably aids in determining the process of cosmic evolution, thus shedding light upon how the cosmos came to have existence and to have evolved into its current structure. These processes should not be ignored by the metaphysician as they contribute an integral part of the picture of the way things are. Reflection upon these though, drives the philosophically inclined to ponder the primordial question. Meeting the interpreted observational data from scientific cosmology pushes the subject beyond the available data into the ambit of reasoned, metaphysical explanation, extrapolated from and informed by the findings of scientific cosmology. The form of the problem of creation, however, is properly one of metaphysics, therefore demanding the philosopher to step up to the task.⁹⁹ Whilst science cannot stretch this far, *scientia* (knowledge reconceived in the Thomist manner of the preceding chapter) is able to. Here, both scientific and metaphysical theories can be considered in the same discussion of the one reality.

⁹⁹ Tallis, 2013.

“The problem [of Creation] in the end is one of metaphilosophy... [wherein credence is given] to philosophic and to scientific claims, seen not as two entirely distinct sorts of intellectual pursuit, but as a continuum” (McMullin, 1981:189).

Thus it is to the theme of creation as knowledge construed within the framework of *scientia* – both physical and metaphysical – that I am compelled to turn in the next chapter. So far, the problems of why and how being came to be have not adequately been answered: they have, however, been identified and counterarguments considered. These foundational questions, though, remain at the heart of the human experience as a being within being, and thus demand a reasonable pursuit of why things came to be in the act of creation.

The term “creation” conceptualised as bringing into being, can make scientists uneasy, as I pointed out in Lemaître’s recollections of Einstein’s reaction to the theory of the initial singularity which he thought directed too much to the creative act (1958:129). Indeed, as a non-scientific event referring to metaphysical foundations, creation transcends science, touching on matters of faith. This, however, is its pertinence for my study. It is my position that it is precisely in the act of creation that the most fundamental – and constantly occurring – interaction between science and faith within being occurs.

Notes:

ⁱ The fifth century BC Greek philosopher, Leucippus was among the first to articulate an atomistic, hence, materialist metaphysics (Diogenes Laertius, [c. 250 AD]1853e). His student Democritus (c. 460 - 370 BC) followed on from his teacher's atomism, to the extent that in his tome, *"The Lives and Opinions of Eminent Philosophers"*, Diogenes explained Democritus' position:

"Everything which is made he looks upon as depending for its existence on opinion; but atoms and the vacuum he believes exist by nature" ([c. 250 AD]1853d).

The materialism of these Greeks was the seedbed of materialism in Western intellectual history, evolving into anti-metaphysical metaphysics and epistemology as expressed by Hume.

ⁱⁱ With a particularly anti-metaphysical penchant, Bacon – in the *Novum Organum Scientiarum* – articulated how universals are perceivable through the scientific method exactly as they are, yet, he discerned a tendency for people to incorrectly continue seeking metaphysical explanations rather than relying upon "positive science":

"... [A]lthough the greatest generalities in nature must be positive, just as they are found, and in fact not causable, yet, the human understanding, incapable of resting, seeks for something more intelligible. Thus, however, whilst aiming at further progress, it falls back to what is actually less advanced, namely, final causes; for they are clearly more allied to man's own nature than the system of the universe; and from this source they have wonderfully corrupted philosophy. But he would be an unskilful and shallow philosopher, who should seek for causes in the greatest generalities, and not be anxious to discover them in subordinate objects" (1854:348).

ⁱⁱⁱ The absolute trust placed in the scientific method by some of the twentieth and twenty-first centuries' most vocal scientists is fairly startling. A few citations illustrating the scientism of a few of these are included for consideration:

"... [T]he selective forces that scrutinize scientific ideas are not arbitrary or capricious. They are exacting, well-honed rules, and they do not favour pointless self-serving behaviour. They favour all the virtues laid out in textbooks of standard methodology: testability, evidential support, precision, quantifiability, consistency, intersubjectivity, repeatability, universality, progressiveness, independence of cultural milieu, and so on" (Dawkins, 2003a:145).

"... [L]et science be the art of the empirically soluble... [Whilst s]cientists can also spin out ideas about ultimates. We don't... because we cannot devise ways to test them, to decide whether they are right or wrong..." (Gould, 1991:452-453).

"Any sound scientific theory, whether of time or of any other concept, should in my opinion be based on the most workable philosophy of science: the positivist approach... A good theory will describe a large number of phenomena on the basis of a few simple postulates and will make definite predictions that can be tested" (Hawking, 2001:31).

"The researches of Brahe, Kepler, Newton, and their successors have presented us with a cold view of the world. As far as we have been able to discover the laws of nature, they are impersonal... They express a viewpoint that is rationalist, reductionist, realist..." (Weinberg, 2003:ix-x).

"The Cosmos is all that is or ever was or ever will be" (Sagan, 1980:4).

In each of these scientists' work there is a superb confidence in the method of science as capable of unearthing the empirically verifiable, meaningful, latent information contained within entities studied by scientists, free from bias.

^{iv} The history of science is replete with accounts of scientific theories replaced by those considered to be of a stronger explanatory proficiency. A cursory exploration of physics and cosmology, as examples, proves this.

Though the *Physics* (written c. 350 BC) of Aristotle (384 - 322 BC) dominated for close to two millennia (Aristotle, [350 BC]2006), in the seventeenth century it was replaced by the work of Isaac Newton (1642 - 1727), in his *Philosophiae Naturalis Principia Mathematica* ([1687]1729). As is known, much prior physics was superseded by Relativity and Quantum Theories in the early twentieth century. The former was developed in two stages: special relativity (in 1905 with the publication of “*On the Electrodynamics of Moving Bodies*”) and general relativity (presented in the 1916 paper, “*The Foundation of the General Theory of Relativity*”) (Einstein, [1905]2011, [1916]1997).

From cosmology, there are various instances of theory-replacement, too. The Alexandrian, Claudius Ptolemy (c. AD 90-168), published his *Almagast* around AD 150, in which a geo-centric model of the cosmos was proposed ([c. AD 150]1998). However, in the sixteenth century, Copernicus developed his heliocentric cosmological model, which forever altered the manner in which humanity perceived itself in the cosmos ([1543]1976). As the Copernican heliocentric system only related to the solar system rather than to the entire Universe, this system was replaced by later developments, as ostensible in current cosmological research whereby the immensity of the cosmos and the location of the solar system indicate that the sun is certainly not at the centre of the cosmos!

Thus, Rescher declared (in an uncompromising manner):

“... [T]he scientific theorizing of one day is looked upon by the next as deficient... [Contemporary scientists] view the work of their predecessors as seriously deficient and their theories as fundamentally mistaken” (Rescher, 1984:86).

^v During the seventeenth century Enlightenment the scientific theories of Galileo and Newton received greater favour than the “quaint” Natural Philosophy of Aristotle that had been relatively unquestioned until that time (McMullin, 1969:37). As a result, Natural Philosophy obtained a negative reputation as “... *ancient physics no longer capable of justification*...” when confronted with then current scientific theory (1969:37). As McMullin argues, the negative prejudice towards “archaic” philosophy of nature was carried forward by Descartes and Kant, who further developed the dichotomy between science and philosophy (1969:37). For example, Kant argued:

“As to the existence of pure natural science... many may still express doubts. But we have only to look at the different propositions which are commonly treated of at the commencement of proper (empirical) physical science—those, for example, relating to the permanence of the same quantity of matter, the vis inertiae, the equality of action and reaction, etc.—to be soon convinced that they form a science of pure physics (*physica pura, or rationalis*), which well deserves to be separately exposed as a special science, in its whole extent...” ([1787]2010:37).

With Kant’s justification, “pure science” was enthusiastically severed from empirical science. Comparison with Descartes’ “*Principles of Philosophy*” (first published in 1644) will draw the reader to note that Kant continued the Cartesian project emphasising observational science.

“... [B]ecause of our sensory stimulation we have a vivid and clear perception of some kind of matter that is extended in three dimensions and has various differently shaped and variously moving parts that cause our different sensations of colours, smells, pain and so on” (Descartes, [1644]2012:22).

Exploring the observable universe, Descartes – again in an empirical vein – described his task:

“... I’ll offer a brief account of the principal phenomena of nature whose causes we must now examine” ([1644]2012:42).

^{vi} With the discovery of Cosmic Microwave Background Radiation (CMB), evidence for the “Big Bang” cosmological model – first developed by Lemaître (with his theory of the expanding universe) – came to light, demonstrating that the universe had once been in a state of immense pressure and heat.

“We can compare space-time to an open, conic cup. One progresses from the past to the future up to the generating lines of the cone, one runs along the tour of space when circulating along the parallel, horizontal circles. The bottom of the cup is the origin of atomic disintegration; it is the first instant at the bottom of space-time, the now which has no yesterday because, yesterday, there was no space... ‘Give me an atom and I will construct a universe out of it’” (Lemaître, 1950:133).

Empirical support for the cosmological model meant that a verifiable theory emerged enabling cosmology to become “respectable” (McMullin, 1981:180-181). Indeed, cosmology became an “*observational science*” because the beginning moments of the present universe are available for scientific study in CMB (Rees, [1976]1998:81).

vii From the third millennium BC the various Egyptian creation myths begin with the separation of earth and sky, repeated each dawn with the rising of the sun that brought light, inferring creation as a continuous event, the action of the Sun God, Ra (Pinch, 2002:114, Allen, 2000:144).

In the 12th century BC, the Babylonian creation narrative, “*Enuma Elish*”, emerged (King, 1902). According to the *Enuma Elish*, the gods Apsu and Tiamet embarked on a creative process bringing forth other gods, among these eventually Marduk (1902). The latter ultimately went to war with Tiamat, establishing supremacy, and from Marduk was brought forth humanity (1902).

Still later – between the 7th and 6th centuries BC – the Genesis creation stories (found in Genesis 1-2) were written as part of the Pentateuch (Davies, 2001:37). In both of these narratives the act of creation by the Creator (identified in Genesis 1:1 as “God”) was a developmental process occurring over a metaphorical period of one week.

viii Thales of Miletus (c. 640 - 546 BC) was first among the Greek cosmologists, viewing water as the primordial substance (Whithrow, 1940:159).

“He [Thales] asserted water to be the principle of all things, and that the world had life...” (Diogenes Laertius, [c. 250 AD]1853a).

According to Diogenes, Anaximander (c. 610 - 546 BC) – the successor of Thales – argued that:

“... [T]he principle and primary element of all things was the Infinity, giving no exact definition as to whether he meant air or water, or anything else” (Diogenes Laertius, [c. 250 AD]1853b).

The third of the Milesians, and student of Anaximander, Anaximenes (c. 585 - 528 BC) determined the primordial principles as:

“... [T]he air, and the Infinite; and that the stars moved not under the earth, but around the earth” (Diogenes Laertius, [c. 250 AD]1853c).

ix *“... [I]n every change or motion there must be something existing in one way now and in a different way before, for the very word change shows this... Furthermore, motion or change must precede that which results therefrom...”* (Aquinas, *Contra Gentiles*, I, Ch. 17, §4-5).

For motion or change to precede the consequence(s) of the action of either motion or change, the particular being upon which the potential motion or change is enacted must exist. The action of creation is further disparate from motion or change in that while motion or change require pre-existing holders of the potential consequent of the feat, were something pre-existing to creation then no creation would have occurred. Instead, all that would be is the act of motion or change (Aquinas, *Contra Gentiles*, I, Ch. 17, §5).

x For example, one may consider Heraclitus’ notion of “*panta rhei*”:

“... [T]he opinion of Heracleitus [sic.] [is] that all things flow and nothing stands...” (Plato, *Cratylus*, 401.d).

Further discussion of more contemporary scientific attempts to explain away the “problem of creation” through petition to motion or change will follow in examination of Gamow ([1954]1998), Narlikar ([1981]1998), Davies ([1984]1998), Grünbaum (1989), Hawking & Mlodinow (2010), Mithani & Vilenkin (2012), Susskind (2012) and Krauss (2012).

xi Some examples from the literature suffice to demonstrate this point:

“A theory which suggests that our Universe started from the extremely compressed concentration of matter and radiation naturally raises the question: How did it get into that state[?]...” (Gamow, [1954]1998:68).

“... [T]he actual point of creation, the singularity, is outside the scope of presently known laws of physics” (Hawking & Ellis, 1973:364).

“Creation myths... attempt to answer the questions we address... why is there a universe, and why is the universe the way it is?” (Hawking & Mlodinow, 2010:123).

xii *“So we have the following description of a big bang Universe. At an epoch, which we may denote by $t = 0$, the Universe explodes into existence... The epoch $t = 0$ is taken as the event of ‘creation’. Prior to this there existed no Universe, no observers, no physical laws. Everything suddenly appeared at $t = 0$ ” (Narlikar, 1977:125).*

The discovery of sufficient observational evidence to support Narlikar’s assertions, such as, that there was nothing material, no physical laws, etc., prior to the initial singularity, removes his speculations from scientific cosmology, placing them squarely in the jurisdiction of philosophical cosmology. Highly problematic, however, is the issue that even philosophical cosmology should be verifiable to a point. However, creation is not verified by science as occurring at the moment of the singularity (Landsberg, 1999:236).

xiii Davies defines the quantum vacuum as *“... empty space... which possesses a negative pressure”* ([1984]1998:234). From the perspective of quantum physicists, the initial singularity is purported to have emerged from the quantum vacuum (Davies, [1984]1998:244). A rather simplistic scientific understanding of the quantum vacuum is that it can be defined as space that contains no matter (Rafelski & Müller, [1985]2006:3). Quite to the contrary, the vacuum is not nothing – as the philosopher would argue by virtue of the fact that it has being, thus making it something – it is instead the *“... the ground (lowest energy density) state of a collection of quantum fields”* (Rugh & Zinkernagel, 2002:663). This ground is the *“background”* for all theories of physics that explore the basis of the cosmos (Penrose, 2004:656).

While it could possibly be held that the quantum vacuum is “nothing” – in the conceptualisation that prior to quantum fluctuations there are no material objects emerging from within it – philosophically this is a misnomer. It must be clarified that for the philosopher nothing is not-being, that is, where something is not because it has no existence. This is the sense of “nothing” (or *“nihilō”*) that the doctrine of *creatio ex nihilo* refers to.

xiv Despite declaring the death of Philosophy (Hawking & Mlodinow, 2010:5), Hawking & Mlodinow seek to answer remarkably metaphysical questions in their scientific work *“The Grand Design”*:

“To understand the universe at the deepest level, we need to know not only how the universe behaves but why.

“Why is there something rather than nothing?”

“Why do we exist?”

“Why this particular set of laws and not some other?” (Hawking & Mlodinow, 2010:10).

In a more current publication, Krauss attempts to solve the same metaphysical problem as Hawking & Mlodinow by employing science:

“For more than two thousand years, the question, ‘Why is there something rather than nothing?’ has been presented as a challenge to the proposition that our universe... might have arisen without design, intent, or purpose. While this is usually framed as a philosophical or religious question, it is first and foremost a question about the natural world, and so the appropriate place to try to resolve it, first and foremost, is with science” (2012:xiii).

Krauss reveals his own confusion in the demarcation between science and philosophy when he categorically states:

“... [I]n science... [w]hen we ask, ‘Why?’ we usually mean ‘How?’ If we can answer the latter, that generally suffices for our purposes” (2012:143).

In this instance, the scientific manner of transcending the metaphysical problem is merely to transform the question of metaphysical character into one of science (2012:144). However, to deceive readers by this sleight of hand does nothing to unravel the presenting problem of being. Furthermore, the plea to quantum nothingness as the cause of why anything is only begs the question (2012:98).

^{xv} Hawking & Mlodinow explain multiverse theory as a product of the “*no-boundary condition*”, which becomes a means to account for evident fine-tuning in the cosmos (2010:164-165):

“According to M-theory [“multiverse theory”], ours is not the only universe. Instead, M-theory predicts that a great many universes were created out of nothing. Their creation does not require the interventions of some supernatural being or god. Rather these multiple universes arise naturally from physical law” (2010:8-9).

The “no-boundary” approach informs the multiverse position for the apparent fine-tunedness of the universe, and indeed, of life on the earth as well as potentially in other universes:

“Were our universe fine-tuned there would be nothing odd since it would be only one among many possible universes which just happened to have the correct conditions for life to have emerged and evolved” (Scott, 2012:394).

This is the position not only of Hawking & Mlodinow as expressed above, but also of Rees (2007:61). Its foundation in the “no-boundary” theory is questionable, however. For while the human can never escape the cosmos to disregard the applicability of physical laws, it is a non-verifiable claim to assert that these same laws also apply in other universes that are not reachable.

A further weighty issue in regard to multiverse theory requires consideration: the authors put forward that the many universes emerge without cause, yet an uncaused, natural cause (the multiverse) – in terms of the content of “*The Grand Design*” – is appealed to as the cause behind the emergence of the multiverse. “*Physical law*” thus remains opportunely out of causality’s harmful way, presented as identical to an uncreated Creator (Scott, 2012:346).

CHAPTER 5:

The *scientia* of creation

“... ‘Why does something exist rather than nothing?’... [G]iven that things have to exist, we must be able to give a reason why they have to exist as they are and not otherwise”.¹

“We are, because we have been made; we did not exist before we came to be so that we could have made ourselves!” (St. Augustine, *Confessions*, XI, iv(6), [397-398]1955:190).

5.1. Introduction:

At all moments of existence, being presents itself to the thinking subject.² This phenomenological experience is no different for the philosopher than for the scientific subject who in particular proposes to explore clearly defined aspects of being in more tangible than abstract terms. In observing and theorising about entities, scientists draw to the fore – in a very acute manner – the primordial metaphysical problem.³ However, argumentation concerning this problem falls clearly outside the bounds of “hard” science.

Nevertheless, as argued in the preceding chapter, there are some schools of thought in “hard” science that hold the firm position that their disciplines can resolve this metaphysical problem. Of course, this assumption is founded on a misconception of the problem of being. Herein, it is presumed that being can arise from a material change in form, such as from a quantum vacuum bringing about the initial singularity.¹ The bringing into existence of anything, however, is not a change in physical form. Rather, the problem itself precedes the possibility of such change occurring. In its essential form, the primeval problem pertains to the bringing into being of contingent being-as-being, not the change in form of that which is already. No explication of change explains why it is that that particular thing – within which change was effected – came to be.

¹ Leibniz, [1714]2006b.

² “Being... is a notion that cannot be controverted: it is assumed in all inquiry and refutation, in all thought and doubt; its acknowledgement is implicit in the breakthrough; and since it embraces all views and their subjects, its acknowledgement is an encirclement” (Lonergan, [1957]1970:522).

³ Leibniz’s afore-quoted articulation of this problem is *the* classical formulation thereof.

Seeking to be reflective of how objects are, scientific knowledge requires more than just itself to develop ample theoretical justification for its existence. Science, though, is bounded to provide knowledge of the particular entities whose being is illustrated in theoretical constructs. The fastidious value of science lies in the describing of the natures of real entities, but being remains unrendered scientifically.

The particular task of this chapter will attempt to sufficiently depict how it is that the existence of entities proposed to exist by the observations and theoretical constructions of scientists can best be accounted for. Founded in earlier argumentation, the paradigm of clarified realism will be employed.

Certainly the scientific method has been wonderfully successful. However, do its methodological purity and its resultant success negate other systematic approaches to knowledge acquisition? Furthermore, does science engage in its activity without the assistance of non-essentially scientific methodological influences?

I will explore these questions in this chapter, proposing that in terms of the demarcation of “hard” science, deliberation over being does not properly belong to science’s competency. However, within the tradition of natural philosophy wherein “science” is defined in a broader, less specialised, sense as “*scientia*” – systematised knowledge of being – the “problem of creation” can be better dealt with. Of necessity this will be handled from the perspective of the thinking subject whose being is grounded within the broader existence of the cosmos. The subject engaging with the constitutive objects of reality employs the scientific method to better understand these, after which the universal question of being emerges: why is it that this discovered thing exists? In this process, a sequence of knowledge transpires from the data of “hard” science to the problem of foundations of the objects reflected in that same data. In fact, science – through the “problem of creation” – faces its own origin in the meta-scientific interaction between the subject and the object of study out of which science emerges. This chapter seeks to demonstrate that neither subject, object, nor science exist by themselves, but as historically contingent beings, relations of beings, and reflections upon beings.

5.2. The metaphysics of science:

The positivist temperament present within scientific practice since the Scientific Revolution – and most certainly throughout Modernity and beyond – has directly impacted the emergence of scientific approaches to conceptualising physical and natural science.

Indeed, this has influenced the manner in which scientists have come to assess their own work. In a particular way, science is thought of as an all-encompassing knowledge system wherein faith is placed such that no other “path to truth” may be granted space to exist as a manner of explication of objects under investigation.

5.2.1. *Philosophy of nature after the Scientific Revolution:*

“The dominant view... is that the philosophy of nature no longer exists. That branch of philosophy died out with the emergence of the modern empirical sciences” (Heller, 2011b:v).

Prior to the advent of the Scientific Revolution (mid-16th century AD), the philosophy of nature was the principle discipline behind the study of the natural and physical world (Heller, 2011b:155, Wallace, 1982:7).ⁱⁱ Indeed, it was the ancient field out of which the Modern scientific method emerged (Heller, 2011b:155).⁴ However, its existence was seriously threatened by the emergence of empirical science in early Modernity. This was perhaps a consequence of natural philosophy having been perceived as too vague. Indeed, empirical science was able to more accurately account for observed phenomena than speculative philosophy was able to..

The problematic to be faced then is whether natural philosophy has any relevance to the academy post the advent of empirical science? The presupposed position that philosophy of nature has been superseded by empirical science may be “... a *crude oversimplification...*”, however (Heller, 2011b:v).

The complexity arises that in Modernity, some philosophers did try to ground scientific activity in philosophical principles, such that it cannot be assumed that philosophy *in* science was merely dismissed. Consideration of the works of René Descartes, Gottfried Leibniz, and Immanuel Kant among others, demonstrate the incorporation of both philosophy and empirical science in an attempt to ensure the latter’s justifiability (2011b:155).ⁱⁱⁱ Examination of these examples demonstrates that empirical science can develop counterarguments against each approach, if addressed on the plane of scientific findings alone. But, the contingent cosmological milieu within which empirical scientific activity occurs is a multifaceted realm. This is a space that can be pulsating with sources

⁴ “Pre-Newtonian systems of the philosophy of nature ... [for example, Plato, Aristotle, and Descartes] fulfilled the function of ‘presciences’ of nature” (Heller, 2011b:155).

for the possibility of philosophical activity.⁵ However, not everything is explainable in philosophical terms, as the acknowledgement of the successes of physical and natural science in extracting knowledge of the contents of being must be made. Hence, recourse to physical and natural science – as supremely fruitful epistemic methods – is required to delineate what could be an acceptable philosophy of nature in light of contemporary “hard” science’s findings, were natural philosophy to still have any relevance. Heller proposes some criterion by which to evaluate the continued existence of natural philosophy:

“... [Any philosophy of nature proposed] *cannot be a theory which ignores the natural sciences in the field which it concerns... [and] it cannot ignore at least the fundamental methodological rules elaborated by contemporary philosophy of science*” (2011b:157).⁶

From the findings of empirical science that direct towards real entities, philosophy of nature is drawn into the real world – wherein empirical science exists – such that natural philosophy becomes a *current* discipline that can dialogue with other sciences.⁷

Whilst empirical science fortifies the philosophy of nature by making its own theories available to it, empirical science requires metaphysics as it cannot account for its existence. That being-as-being is knowable is remarkable, but it is only knowable outside the bounds of the competence of science’s own method.⁸ That is, empirical science explores the objects of its study, but not the reason for it being able to comprehend these objects. It is at this junction – between the known and why the known can be known – that philosophy of nature is crucial: it was born in ancient philosophy out of sophisticated reflection upon the ability of the human to comprehend the world (Heller, 2011b:158-159, Esfeld, 2007).⁹ Both philosophy and science have their beginnings and the source of their

⁵ Indeed, the examples cited of Descartes, Leibniz and Kant point to the philosophical importance of scientific discovery. Hence, I agree with Heller:

“If by the context of scientific discovery one understands everything that creates a climate for, inspires, and suggests new scientific theories, then without a doubt philosophy occupies a prominent place in that context” (2011b:156).

⁶ A contemporary utilisation of natural philosophy thus employs the findings of empirical science, whilst remaining open to speculative philosophy, such as metaphysics, which provides accounts for why particularities exist. In this way, a meeting point between “hard” science and philosophy is able to stand in philosophy of nature, so bypassing the exclusion of the primordial metaphysical problem of existence as present in much positivistic and scientific empirical science and philosophy of science.

⁷ “... [P]hilosophy... *needs science to know about what there is in the real world...*” (Esfeld, 2007).

⁸ The knowability of nature by systematic methodology “... *has long been known... as the problem of the intelligibilitas entis (the intelligibility of being)*” (Heller, 2011b:158).

⁹ *“It makes sense to return to nature with rational questions only when one has reason to expect that it will give rational answers. The Ionian philosophers [i.e. Thales, Anaximander, Anaximenes, etc.] were*

pursuit in the singular reality that is.^{iv} That the scientific method works – in a tentative manner, of course – emphasises the thinking subject’s access to being, evidenced by the partial modelling of nature in her scientific theories. Philosophy is hence of paramount importance in the meta-scientific event of each scientific observation and theory postulation. Here, the object extends itself to the grasp of the thinking subject in presenting its being by its existence.

The problem of being is, therefore, of more than philosophical significance. There are scientific cases of interest in existence’s emergence demonstrating this. Hawking & Mlodinow, for example, argue that philosophy is dead, yet embark on a deeply philosophical project concerning being (2010:1).¹⁰ They pose essentially metaphysical questions, to explain being.¹¹ However, the reason for existence according to Hawking & Mlodinow is physicalist rather than metaphysical: the uncaused multiverse is the reason for this universe emerging (2010:8-9).¹²

In more subtle ways, other scientists have attempted to develop arguments for existence without condemning philosophy to extinction. Among these is a continuation in the Hawking-Mlodinow vein of the removal of the possibility of Divine causal action in the positing of being as the product of physical and natural processes alone. Sean Carroll, for example, proposes to scientifically explain “... *the universe...*” (seemingly in its broad entirety – rather metaphysically, in fact), “... *without involving God in any way*” (2012a:186).¹³ In an earlier draft version of the afore-quoted chapter, Carroll states unequivocally:

*“Nothing in the fact that there is a first moment of time... necessitates that an external something is required to bring the universe about...”*¹⁴

the first to turn to nature with such questions and that is why it is from them that the European history of research into nature begins” (Heller, 2011b:159).

¹⁰ “To understand the universe at the deepest level, we need to know not only how the universe behaves, but why” (Hawking & Mlodinow, 2010:9).

¹¹ “Why is there something rather than nothing? Why do we exist?” (Hawking & Mlodinow, 2010:10).

¹² An article of the author’s covering this topic may be of interest to readers: Scott, C.D. 2012. “The death of Philosophy: a response to Stephen Hawking.”, *South African Journal of Philosophy*, 31(2), 337-357.

¹³ Sean Carroll is a theoretical and astro-physicist at the California Institute of Technology.

¹⁴ Carroll, 2011.

Whilst one may readily agree with Carroll that the initial singularity does not point, in itself, to the existence of an external creative agent, this does not mean that being is accounted for scientifically. Perhaps Carroll's "Ockham"-like approach is explained a little further on in the published paper:

"... [F]or most scientists, adding on another layer of metaphysical structure in order to purportedly explain these nomological facts is an unnecessary complication" (2012a:194).

Whilst Carroll has spent considerable energy researching an innately philosophical problem, the "problem of being" remains. Indeed, the physicalist argument that being emerges from physical processes is metaphysical: science makes an extra-scientific appeal to justify the nature of reality, and this mode of reasoning is metaphysical.

5.2.2. ***Philosophy in the history of physical and natural science:***

At the source of the Modern scientific endeavour lie a number of foundational metaphysical assumptions that remain unproven by employing the scientific method, though are denied by anti-metaphysical positivists.

"In recent memory, the most strident denunciation of metaphysics... has come from logical positivism, the founding movement of the philosophy of science... it began with a commitment to the positivist premise that, in the sciences, human thought has finally progressed beyond its prior religious and metaphysical modes. The emphasis placed by the positivists and later logical empiricists on sensory experience as the subject matter of the sciences was intended precisely to excise any hint of metaphysics..." (Chakravartty, 2010:63).

The positivistic erasure of metaphysics from science set out to propagate the stance that science was an objective, ideologically "uncontaminated" activity. Herein, passive scientists – imaged perhaps as nothing more than conduits – employed the scientific method upon phenomena resulting in the production of untainted data revealing how things are. However, it is evident in empirical science's supposedly provable – by measurement – study of real entities that they assume there is something like a real world to analyse.

"On the basis of empirical evidence... [empirical scientists'] grasp extends to a knowledge of observable entities and processes that exist quite independently of ideas. They aspire to some knowledge of a world that is external to human cognition but nonetheless the subject of experience" (Chakravartty, 2010:70).

These metaphysical assumptions are concentrated upon being-as-being, for they presume that there is something to be explored for scientific activity to occur. Whether the scientist realises his occupation is philosophically undergirded is irrelevant. What remains is that because science attempts to observe, explicate and theoretically represent *the way things are* via its research enterprises makes it buttressed by metaphysical assumptions. Still, as Nicholas Maxwell proposes, rigour demands that the metaphysical assumptions of science be made candid.¹⁵

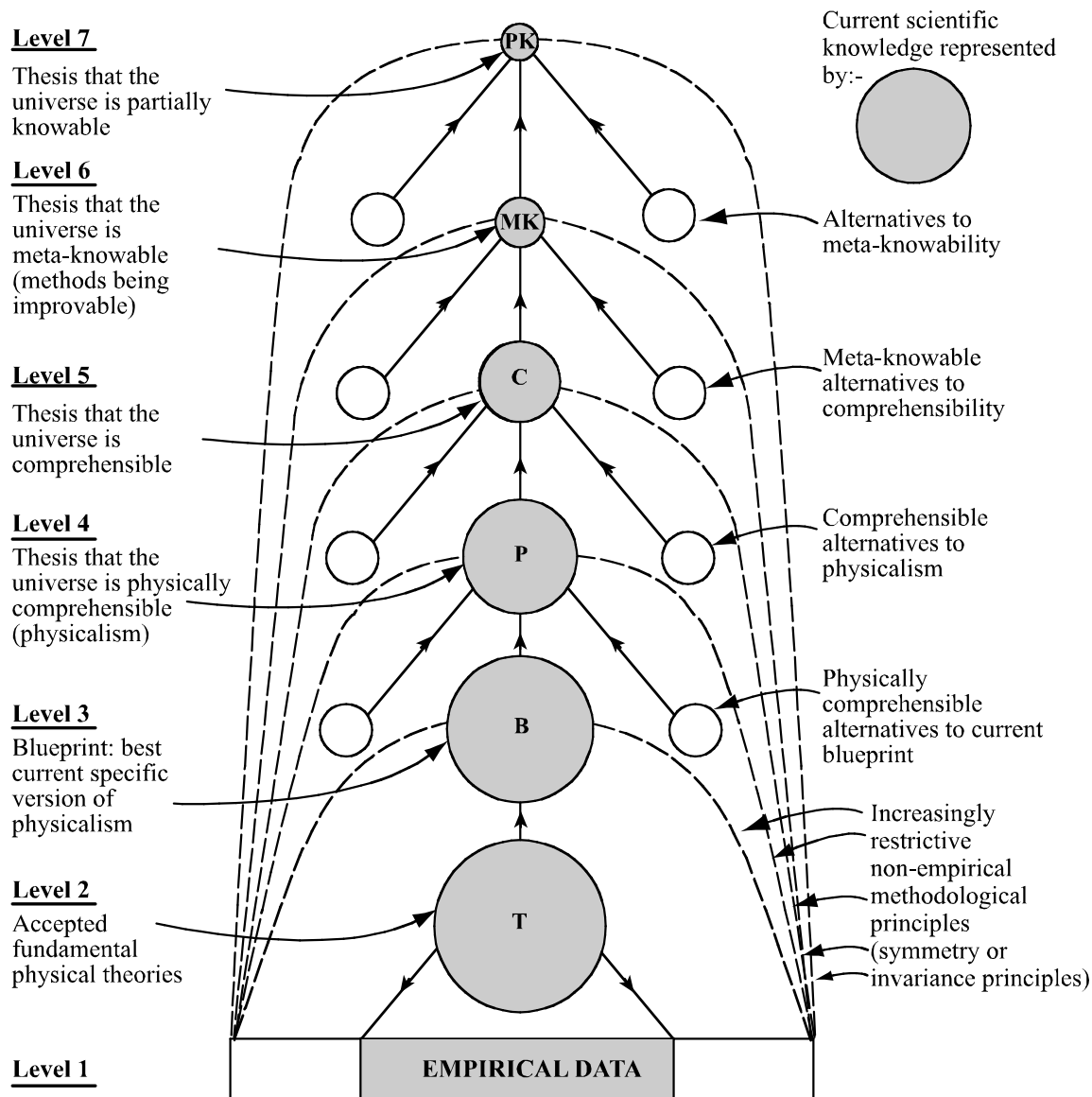
“... [It needs to be considered that] *physics (and science more generally) ... [makes] a hierarchy of assumptions concerning the unity, comprehensibility and knowability of the universe... [T]heir truth is... a requirement for science... to be possible at all...*”¹⁶

At the most rudimentary level of science – observation and consideration of observed data – at least two essential metaphysical assumptions are perceptible. In the first instance, scientists usually hypothesise that there is a “world” external to the agent of science, that is, that there are phenomena to be studied. With confidence I assert that most scientists are not in the habit of philosophically justifying that there is a real world, but simply embark upon their study. Secondly, the action of science assumes that the scientific agent has access to the postulated reality and can study it.

Maxwell has analysed these metaphysical assumptions for science in his “*Theory of Aim-Oriented Empiricism*”, which he illustrates as follows:

¹⁵ Maxwell, 2007.

¹⁶ Maxwell, 2007.



3 Maxwell's graphic representation of the "Theory of Aim-Oriented Empiricism" (2007).

The Maxwellian theory presupposes the first assumption made – that there is in existence something beyond the thinking subject – whilst focusing on the second, that is, that there is something knowable by the thinking subject about the universe. At the top of the schema is the "[t]hesis that the universe is partially knowable".¹⁷ It is the most wide ranging position advocated in the analysis. On the first level lies the most specific knowledge about the universe held – via theory application and interpretation – by the scientific subject. At this level of empirical data the most ready refutation of knowledge can be made in any counterexample being proffered.¹⁸ The history of science is replete with scientific observations differing from one another, and then, with differing theories emerging (at the

¹⁷ Maxwell, 2007.

¹⁸ Maxwell, 2007.

second level). Indeed, these two levels are the most changeable (or falsifiable in the Popperian sense). However, without making the broadest assumption previously articulated (represented at Maxwell's seventh level), no knowledge would be possible at all.^{19 20} This analysis introduces the depth of philosophical involvement in "hard" science. Without metaphysics – as a form of philosophy – in place, science would be impossible.²¹

The intimate liaison between philosophy and science in Western thinking dates from the earliest recorded Greek philosophical works, that is in the natural philosophy of the Ionian philosophers (Heller, 2011b:1, 159).²² Philosophical presence within science can also be defended by analysis of the history of empirical science, from its emergence in the Renaissance (Heller, 2011a:15).

The presence of philosophy in the study of nature is further brought to the fore by the ever-prominent figure of Plato, who was among the first recorded thinkers to conceptualise nature's existence as a causal problem (Heller, 2011b:9). Indeed, the recorded Greek philosophers prior to Plato broke reality down into constituent parts in searching after the *arché*. But from within his dualism, Plato pondered the existence of the world around him:

"What is that which is Existent always and has no Becoming? And what is that which is Becoming always and never is Existent? Now the one of these is apprehensible by thought with the aid of reasoning, since it is ever uniformly existent; whereas the other is an object of opinion with the aid of unreasoning sensation, since it becomes and perishes and is never really existent... [E]verything which becomes must of necessity become owing to some Cause; for without a cause it is impossible for anything to attain becoming" (Timaeus, 27d-28a).

¹⁹ Maxwell, 2007.

²⁰ "At the top there is the relatively insubstantial assumption that the universe is such that we can acquire some knowledge of our local circumstances. If this assumption is false, we will not be able to acquire knowledge whatever we assume. We are justified in accepting this assumption permanently as a part of our knowledge, even though we have no grounds for holding it to be true" (Maxwell, 2007).

²¹ "Science... always comprises not only the claims about the studied universe, but also the assumptions pertaining to the nature of the subject who practises science" (Amsterdamski, translated by and cited in Heller, 2011a:16).

²² Explanation of the Ionian cosmologists has been made in earlier chapters of this work, thus only a brief mention will be made here. The Ionians sought to employ their own reason rather than rely upon the myths dominant in the ancient world of their day (Heller, 2011b:1). This resulted in their seeking of the most basic principle of reality (*arché* [ἀρχή]) (2011b:1, 3). Albeit reductionist, the elementalism of the Ionians led to self-reliant explanations of the world's nature (2011b:3). Thus, for Thales, water was the *arché*, whilst Anaximenes deemed it to be air, and so on (Dampier, 1966:23, Heller, 2011b:2).

Here, Plato introduces into Western history the idea that physically perceptible reality is contingent upon an immaterial, necessary reality: the realm of the *Eidos* (Plato, *Parmenides*, 130b [1997:7], Heller, 2011b:9). Essentially, Plato has distilled the “problem of creation” with which we still grapple (Heller, 2011b:9). His solution to the problem is the causal intervention of the *Demiurge* (variously known as “God”):

“... [W]hen the work of setting in order this Universe was being undertaken... God [the Demiurge] began by first marking them [fire, earth, water and air] out into shapes by means of forms and numbers” (*Timaeus*, 53a-53b).

However, the “problem of creation” was not solved by Plato. The Demiurge cannot be the cause of bringing things into being. Instead, it was only a maker.²³ The primary elements (i.e. fire, earth, water and air) were already extant before the Demiurge began the activity of marking and moulding the elements into “... *forms and numbers*” to mirror the realm of Ideas (Plato, *Timaeus*, 53a-53b, Heller, 2011b:11).

Aristotle – as is well-documented – inverted the Platonic modelling of the realm of Ideas in objects perceived by the senses: he construed essences as extant in objects (Heller, 2011b:17). Philosophical concern with nature returned in full force in Aristotle, as there was no need to seek being beyond what is (2011b:18). Rather, the task of the philosopher was to study being in objects before the observing philosopher, that is, in nature itself (2011b:18). The Aristotelian determination that first principles be sought in substantive being directed Aristotle to place metaphysical speculation at the pinnacle of the pursuit of knowledge that was always grounded in substantial form (*Metaphysics*, 1003a).

“There is a science which studies Being qua Being... This science is not the same as any of the... particular sciences, for none of the others contemplates Being generally qua Being; they divide off some portion of it and study the attribute of this portion... But since it is for the first principles and the most ultimate causes that we are searching, clearly they must belong to something in virtue of its own nature. Hence if these principles were investigated by those also who investigated the elements of existing things, the elements must be elements of Being not incidentally, but qua Being. Therefore it is of Being qua Being that we too must grasp the first causes” (Aristotle, *Metaphysics*, 1003a).²⁴

²³ The reader will bear in mind the Thomist distinction between maker and creator (Aquinas, *Contra Gentiles*, II, Ch. 17, §2).

²⁴ The emphasis is my insertion to illustrate the Aristotelian unity between philosophy and the other sciences apparent in studying nature.

In Aristotle's estimation "being" referred directly to substance.²⁵ This could best be studied in objects present to the thinking subject, i.e. in nature itself.²⁶ At the most basic level, Aristotle brought the study of nature and philosophy into the same milieu. This wholeness remained throughout the rise of Christianity as the Aristotelian approach became *the* dominant science between c. 300 BC until the Scientific Revolution (c. AD 1600) (De Witt, 2010:7). One should not presume that there were only Aristotelians, however, during these approximately two millennia. But, whilst there were some followers of Plato, for instance, there was also a majority consensus that followed a somewhat Aristotelian line (i.e. an adapted form of Aristotelian physics and metaphysics):

"... [T]he belief systems of large segments of the western world... were very much in the Aristotelian spirit [such as t]he belief that the Earth was the center of the universe, that objects had essential natures and natural tendencies, [etc.]..." (De Witt, 2010:12-13).

The advent of the Scientific Revolution was heralded by the earlier Copernican Revolution, which altered the Western conceptualisation of the cosmos (Heller, 2011b:37). Copernicus' "*De Revolutionibus Orbium Coelestium*" brought about a particularly well-ordered cosmic image as he proposed that the Earth and the other planets revolved around the sun in regular orbits (as represented in Copernicus' graphic below). With great certainty, Copernicus put forth:

"Solem... circa ipsum esse centru mundi" (*De Revolutionibus*, Book I, Ch. 10 [1543:9]).²⁷

Copernicus' conclusion was the product of his astronomical project that had a particular ecclesiastical impetus, which he describes in the Preface of *De Revolutionibus* (1543:*Praefatio Authoris*). Under Pope Leo X, discussion of the reform of the ecclesiastical calendar had emerged in the Fifth Lateran Council (1512 - 1517) (1543:*Praefatio Authoris*). Subsequent to this, the Bishop of Fossombrone, Paul,

²⁵ "The term 'being' is used in various senses... but always with reference to one principle. For some things are said to 'be' because they are substances; others because they are modifications of substance; others because they are a process towards substance... or qualities of substance, or productive or generative of substance or of terms relating to substance, or negations of certain of these terms or of substance... Now in every case knowledge is principally concerned with that which is primary, i.e. that upon which all other things depend... If, then, substance is this primary thing, it is of substances that the philosopher must grasp the first principles and causes" (Aristotle, *Metaphysics*, 1003a-1003b).

²⁶ "Substance is thought to be present most obviously in bodies" (Aristotle, *Metaphysics*, 1028b).

²⁷ I have translated this from the Latin as:

"It is a fact that the sun is the centre of the universe."

encouraged Copernicus to solve the problem of the calendar astronomically (1543:*Praefatio Authoris*). Thus, we may infer that the inspiration for Copernicus' study of the revolutions of celestial bodies did not originate – but did find their support – in his observations, but rather they began in the Church's need, of which Copernicus believed:

“... [Q]uibus et hi nostril labores... ecclesiasticae conducere aliquid, cuius principatem tua Sanctitas nun tenet” (1543:*Praefatio Authoris*).²⁸

This digression aside, the consistency of this cosmic schema in Copernican heliocentrism may have, I argue, encouraged later mechanistic explanations for natural phenomenon in scientific theories. Copernican heliocentrism, was however, not grounded in verifying empirical evidence, for the corroborating evidence was only later confirmed by Galileo ([1613]2008:109).²⁹ But, Copernicus had hinted at a conceptualisation of the regular – even mechanistic – nature of the universe:

“Inuenimus igitur sub hac ordinatione admirandum mundi symmetriam, ac certu harmoniae nexum motus et magnitudinis orbium...” (*De Revolutionibus*, Book I, Ch. 10 [1543:10-11]).³⁰

Whilst I would not propose that Copernicus was a mechanist, I remain convinced that there was mechanistic thinking in his work, especially for his mentioning of symmetry, harmony in movement, etc. (1543:10-11). This I argue contributed to later astronomical research as can be detected in Galileo's own heliocentrism, which was Copernican. In his letter to Fr. Castelli, Galileo declares the falsity of both the astronomical models of Aristotle and Ptolemy and confesses his own embracement of the Copernican model ([1613]2008:107). Galileo also notes the regularity of the solar system, though he does so with the aid of empirical evidence not available to Copernicus:

²⁸ Translated from the Latin:

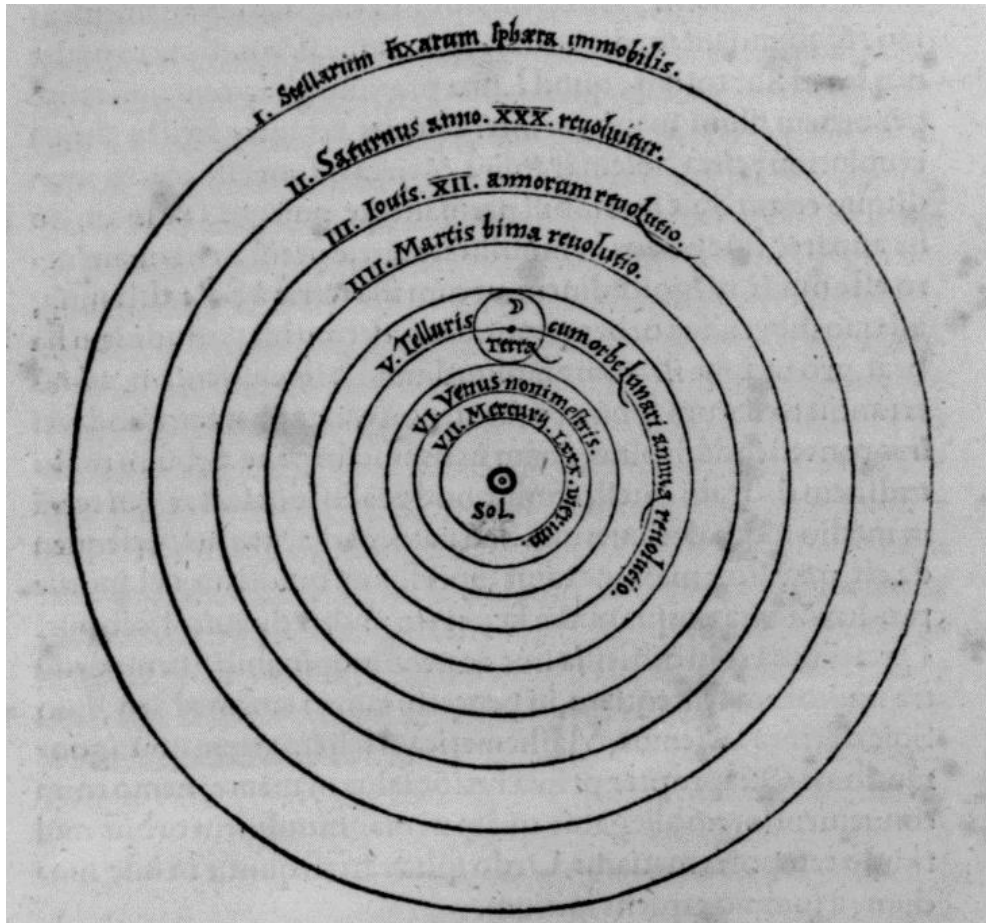
“My work... unless I am mistaken can make some contribution to the Church, at the head of which Your Holiness [the Preface was dedicated to Pope Paul III] now stands.”

²⁹ Thomas Kuhn argued that Neo-Platonism had heavily influenced Copernicus' heliocentrism (1957:128, 130). According to Rosen, however, there is nothing in Copernicus' writings that support the assertion that he was – or was influenced – by a Neo-Platonist (1983:667, 669). Nevertheless, Copernicus was not only familiar with Plato, he also made frequent reference to him in the *De Revolutionibus* (cf. 1543:Introduction, Book I, Ch. 5, 10, 11). Due to the evidence available from the primary text, I would support Rosen in this regard.

³⁰ Translated as:

“In this heliocentric arrangement there is remarkable symmetry apparent in the universe, and there is an established connection between the harmonious movement of the spheres and their size.”

“... I have discovered and conclusively demonstrated that the solar globe turns on itself, completing an entire rotation in about one lunar month, in exactly the same direction as all the other heavenly revolutions; moreover, it is very probably and reasonable that, as the chief instrument and minister of nature and almost the heart of the world, the sun gives not only light (as it obviously does) but also motion to all the planets that revolve around it...” ([1613]2008:109).



4 Copernicus' representation of his theory of a heliocentric universe (*De Revolutionibus*, 1543).

It is thus that I argue, Copernicus' heliocentrism impacted upon the identification of regularities, which would influence not only Galileo, but Descartes' thinking even more acutely.

Descartes attempted to develop “*mechanistic rationality*” throughout his works, which were at times geometrical, mathematical, philosophical, and even biological (Heller, 2011b:40). Still, he remained resolute that his research was philosophical in its essential

nature.³¹ Descartes' natural philosophy, though, leaned heavily toward mechanistic philosophy as he conceptualised the components of the natural world as machine-like, operating in regular fashion:

"I suppose the body to be just a statue or a machine made of earth..."
(Descartes, [1662]2004:99).³²

However, Descartes' metaphysics was founded in his dualism, such that whilst mechanical reason could explain material substance, it could not extend beyond the functioning of substances into metaphysical problems (Heller, 2011b:41). In Descartes' hypothesis that physical bodies operate as machines he defined the limits of what could be considered a body subject to mechanistic principles, thus excluding all that was outside the delimitation:

"... [T]he nature of matter (i.e. body considered in general) consists not in its being a thing that is hard or heavy or coloured, or affects the senses in this or that way, but simply in its being a thing that is extended in length, breadth and depth..." (Descartes, [1644]2012, II, §4).

It is intriguing that more than two decades after the publication of the mechanistic Descartes' *The Treatise of Man*, Isaac Newton put into print his seminal mathematical tome that included in its title more than a subtle reference to natural philosophy.³³ The contents of the *Principia* comprise a substantial philosophical component, including direct

³¹ *"In trying to explain the general nature of material things I haven't used any principle that wasn't accepted by Aristotle and all other philosophers of every age. So this philosophy, far from being new, is the oldest and most common of all. I have considered the shapes, motions and sizes of bodies and examined what has to result from their interactions in accordance with laws of mechanics that are confirmed by reliable everyday experience"* (Descartes, [1644]2012, IV, §200,).

³² Descartes explains his mechanical natural philosophy relating to bodies:

"... [C]onsider that all the functions that I have attributed to this machine [e.g. digestion, heart function, respiration, senses, movement, thought, memory, etc.]... follow... simply from the disposition of the organs as wholly naturally as the movements of a clock or other automaton... To explain these functions... it is not necessary to conceive of any vegetative or sensitive soul, or any other principle of movement or life, other than its blood and its spirits which are agitated by the heat of the fire that burns continuously in its heart, and which is of the same nature as those fires that occur in inanimate bodies" (Descartes, [1662]2004:169).

³³ Isaac Newton's *Principia Mathematica Philosophiae Naturalis* ("The Mathematical Principles of Natural Philosophy") was published in 1687. Descartes had died in 1650. In the Preface (to the first edition), Newton articulated the philosophical dimensions of his work as a mathematical ground for Philosophy ([1687]1846:lxvii).

"... [W]e offer this work as the mathematical principles of philosophy... I hope the principles here laid down will afford some light either to this or some truer method of philosophy" ([1687]1846:lxviii).

reference to the role of God as creator of all things (Heller, 2011b:49).³⁴ At the end of the *Principia*, Newton makes reference to the causes that underlie the laws of nature about which he has been attempting to theorise (Newton, [1687]1846:506-507, Chakravartty, 2010:64-65).³⁵ While it is plain that Newton gives importance to the seeking of first causes (“... *whether metaphysical or physical...*”), he is particularly cautious to include mere suppositions in the *Principia*, wherein he had been seeking *foundations* ([1687]1846:506-507).³⁶ Of course, his caution does not negate the importance of philosophy in his work, but instead reveals the strength of argument Newton wishes to include in his grounding principles, be this philosophical or otherwise.

Amid the “certainties” at the foundational level of physical reality discovered by Newton, can be listed his hugely influential – and still current – “Laws of Motion”.^v These, although not at the basis of Newtonian mechanism were theoretically undergirded by Newton’s philosophical – i.e. non-empirical – concepts of “absolute space” and “absolute time” ([1687]1846:77).^{vi} Newton was aware, though, that “*the vulgar*” will critique his use of these postulates for their non-empirical nature, hence prejudicing their view ([1687]1846:77). But, we must always recall that Newton – as a renowned mechanist – grounded his science in the non-empirical.

In the interleading period, that is, until the twentieth century, Newtonian mechanistic thinking undoubtedly dominated mechanical physics (Heller, 2011b:131). Indeed, the absolute success of physics in explaining the mechanics of bodies resulted in mechanistic philosophy of nature becoming the sole credible philosophy of nature (2011b:131). So great was its authority that it was extended to other areas of science, too: biology,

³⁴ “*This most beautiful system of the sun, planets, and comets, could only proceed from the counsel and dominion of an intelligent and powerful Being... This Being governs all things, not as the soul of the world, but as Lord over all... He is eternal and infinite, omnipotent and omniscient... He is not eternity or infinity, but eternal and infinite; he is not duration or space, but he endures and is present... Since every particle of space is always, and every indivisible moment of duration is every where, certainly the Maker and Lord of all things cannot be never and no where... God suffers nothing from the motion of bodies; bodies find no resistance from the omnipresence of God*” (Newton, [1687]1846:504-505).

³⁵ In this regard, Heller argues that Newton saw the detection of first causes as the *telos* of his scientific enquiry (2011b:47). Newton placed the speculation about causes in the final part of the conclusion of his text – a point to which his whole work had been developing – to emphasise the importance thereof (Newton, [1687]1846:506-507, Heller, 2011b:52).

³⁶ “*Hitherto we have explained the phaenomena of the heavens and of our sea by the power of gravity, but have not yet assigned the cause of this power. This is certain... it must proceed from a cause that penetrates to the very centres of the sun and planets... But hitherto I have not been able to discover the cause of those properties... from phaenomena, and I frame no hypotheses; for whatever is not deduced from the phaenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical... have no place in experimental philosophy...*” (Newton, [1687]1846:506-507).

psychology, etc. (2011b:131). However, a challenge towards this philosophy of nature emerged in the early part of the twentieth century from Quantum and Relativity Theories (2011b:133). Instead of classical Newtonian physics located at the base of physical reality, mechanism was replaced by variance, for a wave/particle is both wave and particle simultaneously when in a state of superposition (2011b:133). Additionally, the manner in which the wave/particle function collapses from the superposition to either wave or particle is indeterminate; it cannot be predicted for it does not “behave” in a regular and predictable pattern. Thus, mechanistic philosophy of nature was partially usurped, and with it, the outmoded *absolute* analogy of the cosmos and all within it functioning as a regular machine. Mechanism though retains its place in physics beside quantum physics, although on different planes of existence.

Quantum and relativity theory lead us closer to our primary concern, for they touch on one of the richest sources for philosophical reflection in contemporary science, that is, cosmology (Heller, 2011b:141). Prior to theoretical postulations on the initial singularity emerging out of the quantum vacuum, Einstein – the developer of relativity theory – attempted to retain his notion of a static rather than an expanding universe by altering his original field equation to include the “cosmological constant” (symbolised as “ Λ ”) (Tryon, 1973:396-397, Carroll, 2001, Hawking & Mlodinow, 2010:136-137).^{vii}

“... [I]t is possible to select a system of reference so that at spatial infinity all the gravitational potentials $g_{\mu\nu}$ become constant” (Einstein, [1917]1952:177).³⁷

In this selection, Einstein adapted the Friedmann equations for his “static universe” model to be saved, as he realised that a static universe would be comprised of objects attracted to one another, forcing the universe to contract in on itself (Rees, [1999]2000:108). Nevertheless, Einstein’s 1917 hypothesis was not to last, for the theoretical construction by Lemaître and the observational data support of Hubble for the expanding universe theory nullified Einstein’s static universe proposition (Lemaître, 1927:58, Hubble, 1929).³⁸ However, Einstein’s cosmological constant is now placed amidst the principles making

³⁷ Original text published in German as: Einstein, A. 1917. “Kosmologische Betrachtungen zur allgemeinen Relativitätstheorie.”, *Sitzungsberichte*, 142-152. Berlin: Königlich Preußische Akademie der Wissenschaften.

³⁸ In what has become something of a scientific myth, Gamow shares the following anecdote relating to Einstein’s introduction of the cosmological constant:

“... [W]hen I was discussing cosmological problems with Einstein, he remarked that the introduction of the cosmological term was the biggest blunder of his life” (1970:44).

the expanding universe possible.³⁹ With a cosmological constant just more than zero ($\Lambda \neq 0$), the universe does not contract in upon itself but instead expands at a rate slightly above gravity (as experienced upon the Earth) (Rees, [1999]2000:108-109).⁴⁰

Lemaître, Hoyle, and Einstein among others, contributed towards the emergence of cosmology as an empirical science. It has been strengthened especially with the discovery of CMB in 1965 and the more recent measurement of the cosmological constant.⁴¹ Each of these discoveries provide fodder for Philosophical Cosmology, particularly in their contribution towards responding to the primordial metaphysical question (Heller, 2011b:141). Such responses may simply encourage questioning about cosmic origins. Still, of paramount relevance is that they underscore the “problem of creation” and highlight that study of scientific history exposes that many scientists have also attempted to answer the philosophical conundrum of why being is. Philosophically, however, there has not been a vast amount of current research done into the “problem of creation” (Te Velde, 2007:74). Whilst Te Velde makes a generalisation, his admonition against merely assuming being without pondering why being is, should be taken as seriously by philosophers as it has by scientists in the history of science I have explored:

“The existence of the world, including the existence of human beings who know about the world as a whole, is taken for granted without asking further whether human beings can reach an adequate self-understanding within the horizon of the natural world” (2007:74).

Where being is assumed without question, and where particulars are explored – as in focused scientific disciplines – at the expense of the broader whole of being, metaphysical knowledge that transcends any particular experience in its generality is neglected. Yet, in every moment, the universal problem of being – its contingent existence by virtue of it being, i.e. its creation – lies unnoticed.

³⁹ Finazzi *et al.*, 2012.

⁴⁰ Supportive evidence for the existence of Λ as well as for its measurement as non-zero won the chief researchers involved the 2011 Nobel Prize for Physics, thus almost unquestionably vindicating Einstein’s 1917 hypothesis (Royal Swedish Academy of Sciences, 2011, Reiss *et al.*, 1998, Perlmutter *et al.*, 1999).

⁴¹ Penzias & Wilson, 1965 & Reiss *et al.*, 1998.

5.3. The causal problem of creation:

The “problem of creation” is situated within the bounds of the broader philosophical theme of causality. For a scientific realist causal actions are extra to the thinking subject as they are the product of an intimate relation between each cause-effect act (Chakravartty, 2007:93). Nevertheless, far from being explicable by empirical means alone, causality – while evident from empirical research – cannot be reduced entirely to the empirical (2007:90). After all, causation is an inference made on the part of the scientist from the raw data that is essentially symbolic of the phenomenon encountered.⁴²

An *actual* reflection of causality is helpful. Within the context of scientific cosmology – our focus – empirical methodology should be employed to obtain and interpret data founded in observation, representative of the phenomenon wherein it is hypothesised that causal relationships exist. However, when probed relating to the effect that is the existence of the cosmos as a whole, empirical data cannot be had prior to the sight of cosmic microwave background radiation at 380 000 years after the initial singularity (Heller, 2011b:141).⁴³ Furthermore, physics in its current form cannot cope with the extreme nature of the cosmos during its earliest period of existence, where at 10^{32} K, physics collapses (Stoeger, 2010a:173, 175).^{viii} Thus, in relation to cosmology, scientific methodology is bounded:

“The nature of causation... is not something that can be settled by empirical investigation alone” (Chakravartty, 2007:90).

Philosophical discourse has posed numerous considerations of causality throughout its history (2007:92). Among its first recorded critics was the second century sceptical philosopher, Sextus Empiricus (Chakravartty, 2007:96).⁴⁴ Empiricus utilised counterarguments to causality initially proposed by Aenesidemus (2000:44).⁴⁵

⁴² While the statement that “... causation... is a representational real pattern...” can be asserted as a roughly true estimation (understanding) of the reality toward which the symbolic representations of phenomena point, the analogical nature of the scientific activity must always be recalled (Ladyman *et al.*, 2007:258).

⁴³ European Space Agency, 2013.

⁴⁴ “What are the modes which overthrow those who offer causal explanations?” (Sextus Empiricus, 2000:44).

⁴⁵ Aenesidemus was a 1st century BC Greek philosopher, who – like Empiricus – belonged to the sceptical tradition. Empiricus briefly cites Aenesidemus’ arguments: those who propose causal accounts do not demonstrate their conformity to the apparent effect; causal accounts neglect multiple alternate accounts for perceived effects; causes do not demonstrate the order in apparent effects;

“Thus, it is no doubt possible to refute... causal explanations” (2000:46).

Mediaeval and early Modern thinkers had made constant appeal to the role of causality as proof for the existence of God.^{ix} However, the Enlightenment witnessed a reprise of an unmistakable critique of causality in the work of two of its most influential figures: Hume and Kant. As the former denied that one could empirically observe causal relation between events, deeming causality as totally cognitive the latter was in agreement as to causality being one of the mind’s tools that assists understanding (Chakravartty, 2007:93, 95).

Where Aquinas and Descartes had made appeal to a metaphysical causal agent, Hume – an anti-metaphysician of note – made no such appeal in removing causal relationships between perceived causes and effects entirely!⁴⁶ Hume demonstrates by utilising his infamous example of the billiard balls that cause-and-effect are totally different events in the narrative of the objects concerned.⁴⁷ All that occurs is two events in-time, whose successiveness could be questioned as could the presence of other causes for any particular event.⁴⁸ Kant, in his discussion of Hume on causality lucidly expresses the Humean position:

“Explain to me what entitles you to think there could be a thing x such that: given that there is x, there must necessarily also be something else y—for that’s what the concept of cause says” (Kant, [1783]2007:2).

appeal to causes is a retrospective act whereby a cause is inferred from a known effect; oftentimes when an effect is puzzling, the assigned cause is also of this variety, and so on (Sextus Empiricus, 2000:45).

⁴⁶ “... [M]etaphysics... isn’t properly a science... but arises either from the fruitless efforts of human vanity, trying to penetrate into subjects that are utterly inaccessible to the understanding, or from the craft of popular superstitions...” (Hume, [1748]2008:4).

⁴⁷ “We fancy that... we could have known straight off that when one billiard ball strikes another it will make it move... [But the mind] must invent or imagine some event as being the object’s effect... The mind can’t possibly find the effect in the supposed cause... for the effect is totally different from the cause and therefore can never be discovered in it. Motion in the second billiard ball is a distinct event from motion in the first, and nothing in the first ball’s motion even hits at motion in the second” (Hume, [1748]2008:13).

⁴⁸ “... [E]very effect is a distinct event from its cause. So it can’t be discovered in the cause, and the first invention or conception of it a priori must be wholly arbitrary. Also, even after it has been suggested, the linking of it with the cause must still appear as arbitrary, because plenty of other possible effects must seem just as consistent and natural from reason’s point of view. So there isn’t the slightest hope of reaching any conclusions about causes and effects without the help of experience” (Hume, [1748]2008:14).

The appeal to any cause-and-effect relationship, Hume posits, is nothing more than a customary habit of the mind, whereby we forestall that experienced events of the past will be the same in the future (Hume, [1748]2008:21). Thus, within the Humean paradigm, causal argumentation should not form part of science as the inferred relationships between “cause” and “effect” are improbable:

“...[N]o reasonable scientist has ever claimed to know the ultimate cause of any natural process, or to show clearly and in detail what goes into the causing of any single effect in the universe” (Hume, [1748]2008:14).

Whereas Kant attempted to develop a response to the Humean sceptical approach towards causality, the debate regarding both Kant’s success in his reaction to causality, and indeed, about what the Kantian approach actually was continues.⁴⁹ The relationship between Hume and Kant’s work was intimate, as Kant acknowledges in his *Prolegomena*: it was Hume’s critical philosophy that had freed him from his legendary “*dogmatic slumber*” ([1783]2007:4).

This digression aside, the origin of Hume’s attack on metaphysics was – according to Kant – the problem of cause-and-effect reasoning ([1783]2007:2). The Kantian reading of Hume is that by examining the existence of one entity we cannot infer why another should exist, too ([1783]2007:2). Moreover, in defence of Hume, Kant argues against the attacks of Hume’s countrymen – the Scottish “common sense” philosophers (among them James Beattie and Thomas Reid) – that Hume had never conceived cause as non-existent or frivolous ([1783]2007:3). Rather, Kant posited that Hume had argued that causality could not be reasoned as self-evident, i.e. as without experience ([1783]2007:3). The problematic instead was that given the multiple variables that interfere with human perception and cognition, how empirical observation could be made of causality ([1787]2010:91-92).

“... [T]he conception of cause... must either have an a priori basis in the understanding, or be rejected as a mere chimera. For this conception demands that something, A, should be of such a nature that something else, B, should follow from it necessarily...” ([1787]2010:91).

Kant’s claim is that causality, substance, and causal interactions are all “*a priori*” notions, without any foundation in sensory experience: these entities’ locations are solely in reason ([1783]2007:34). Were these founded in contaminated sensory experience, Kant would

⁴⁹ De Pierris & Friedman, 2008.

have to declare them as fictive ([1783]2007:34). The rationale for this is plain: causality cannot be accessed from the object, for Kant had earlier argued that the thinking subject never has access to the thing-in-itself ([1783]2007:35). However, this is not what Kant seeks to do in the *Prolegomena* ([1783]2007:35). Rather, he solves the Humean problem in appeal to appearances rather than to the inaccessible “*Ding an sich*” ([1783]2007:35). In so doing, causality is related to appearances of things such that the “*possibility of experience*” is apparent to the thinking subject ([1783]2007:35).

Causation for Kant is, thus, a cognitive function that permits humans to conceptualise – and even make possible – their experiences (Chakravartty, 2007:95). This apparatus is a *priori*, i.e. innate and without experience (2007:95). Indeed, causality becomes an entirely transcendental phenomenon as a means of understanding, but not a part of reality extra to the thinking subject (2007:95). Furthermore, as causality is an imposition upon appearance it does not begin in science, and so cannot be verified by science (Dampier, 1966:484). Therefore, causal relations between objects are not to be found in the real world, for they exist only as projections by the subject on appearances rather than as objective, universal laws in things themselves (Chakravartty, 2007:95).⁵⁰

“I may have occasion to make such a [cognitive] judgement, reporting that in my perceptions one kind of appearance is regularly followed by another... [But, t]his doesn't connect the two necessarily, and it doesn't involve the concept of cause... it is merely a subjective connection of perceptions” (Kant, [1783]2007:35).

Kant's solution lay in the mind ([1783]2007:36). However, neither Kant nor Hume's positions were as radical as their twentieth century counterpart-critic of causality, Bertrand Russell, who desired causality's total removal from philosophical discourse ([1913]1992:193).⁵¹ His argument was based on the premise that causality is not a scientifically employed notion ([1913]1992:193, 210). Instead, Russell put forth that science utilises various determinants – abstracted as functional relations, *not* as causes – which account for particular occurrences ([1913]1992:190, 210). The term “cause” for Russell was overtly deterministic, absolute, even inductively prescriptive, without – in the

⁵⁰ “*When these concepts [e.g. causality] are applied to the world of the senses, the principles that arise from this use help our understanding to manage our experience. Beyond... experience they are arbitrary connections with no objective reality*” (Kant, [1783]2007:36).

⁵¹ In no uncertain terms, Russell declared his repugnance for causality:

“... [T]he word 'cause' is so inextricably bound up with misleading associations as to make its complete extrusion from the philosophical vocabulary desirable” ([1913]1992:192).

practice of empirical science, at least – knowledge of what would happen in the future.^x While appeal may be made to existing natural laws as a counterargument, Russell clarifies:

“I... do not deny that the observation of... regularities... is useful in the infancy of science... What I deny is that science assumes the existence of invariable uniformities of sequence of this kind...” ([1913]1992:198).

For the scientific realist Russell’s acknowledgement of regularities in scientific research may be some consolation. But, patterns in physical and natural scientific research are not once-off occurrences: the strength of their existence is borne by repetitive testing (Chakravartty, 2007:94). The question should thus be begged to deniers of causality: how do necessary causal relations continue to be discovered and maintained in empirical experimentation and the resultant theory production? In a very real sense, causal necessity in hard science is evident (2007:94). In a fairly extended discussion on Russell, Ladyman *et al.* utilise this point: for practitioners of science oftentimes articulate themselves in causal terms (2007:258-266, 269-270).

Where Hume, Kant and Russell’s issues arise is in evidentially proving causal links between any cause A and effect B in time, where B is an immediately subsequent event in time to A and is the specific result of the causing action of A.⁵² Amidst the more current critiques levelled is that of contiguity, for there are moments of time – regardless of how infinitesimally miniscule – between event A and event B (2007:109). However, this is a position only tenable if event A and event B are interpreted as independent (2007:109). In Chakravartty’s assessment, the two events overlap as do the properties that enable the cause to result in the effect to occur at all, for instance, the environment within which the event occurs (2007:109). There is thus one singular interactive event between A and B until A and B can no longer relate (2007:110).

We have considered causal events between a supposed cause and its effect *in time*. However, the conception of causality between two events in time – whether discrete or not – is a different form of causation than the causality of the “problem of creation”. Creation does not concern event A causing event B *in time*. Scholastically, the causation that has been deliberated and critiqued has concerned *mutation* – changes in pre-existing material form. However, if causality concerns creation – defined as the bringing about of

⁵² Chakravartty discusses a number of contemporary objections in this line: contiguity, regress, and the requirement for a causing agent (cf. 2007:97-104).

existence – a posited cause A acts from outside time to bring about the being of effect B.⁵³ In this conceptualisation of causation, the act of creation is not a once off event ($A \rightarrow B$), but causal action that is always occurring to hold all in existence (Stoeger, 2010a:181).

The various models posited by scientific cosmology relate to the form of causality criticised by Hume, Kant, etc. Their focus is upon presenting entities – causes and effects in time – whose ontology is assumed as in place by the scientists exploring them (Artigas, 2006:188).⁵⁴ Causality – *qua* bringing into being – is not a part of such scientific cosmological models, however. Instead, the sciences of astrophysics and cosmology observe, experiment and hypothesise about objects extant, for through technology these are experientiable in the present. Thus, while scientific cosmologists may accurately put forth models founded in physical causal relations – despite the critiques offered by the non-scientists we have explored – the more fundamental theme of causality, namely the problem of the emergence of the being of the entities which the models attempt to account for, remains obscure.

“Even if we do get a mathematical structure in which the answers to all interesting physical questions are contained, it still will not be clear how the systems of equations got the ‘spark of existence’” (Heller, 2011b:146).

Though causality can be philosophically denied or scientifically assumed, philosophical appearances and scientific objects exist, although no grounds for their being is provided. How then do we respond to Leucippus’ maxim that all things require a cause?⁵⁵ We could perhaps follow the anthropocentrically nihilistic pessimism of Russell, within whom the primordial question is simply shunned (Dampier, 1966:496).⁵⁶ The philosopher’s choice,

⁵³ One should recall that according to the FLRW model, with the emergence of space in the initial singularity, time originated as part of the continuum (Penrose, 2004:713, 719). Whilst the emergence of space-time is outside the bounds of the cosmological explorations of scientific cosmologists, that the space-time continuum has being begs the question.

⁵⁴ The reader is referred back to the arguments presented concerning the metaphysical assumptions of science.

⁵⁵ A fifth century BC Greek atomistic philosopher, Leucippus gave Western Philosophy the principle of causality in the dictum:

“Nothing happens without a cause, but everything with a cause and by necessity” (in Dampier, 1966:23).

⁵⁶ “... [M]an is the product of causes which had no prevision of the end they were achieving; his origin, his growth... are but the outcome of accidental collocations of atoms... that the whole temple of man’s achievement must inevitably be buried beneath the debris of a universe in ruins—all these things... are yet so nearly certain that no philosophy which rejects them can hope to stand. Only within the

for Russell, is clear: humanity must realise there is no meaning in her origin for the emergence of the human is the product of the accidental relationality between atoms ([1910]1959:47-48). Only when this has been accepted can people accept their predicament as non-teleological creatures. But Russell has not answered a fundamental question: what is the impetus behind the being of the atoms and processes that result in the formations that end in the emergence of the human? Recourse to a causal argument is required or the question remains unanswered.

Following Dampier's lead of placing philosophically dichotomous figures beside one another in considering Russell's Cambridge-contemporary, the astrophysicist Arthur Eddington, we may create a dilemma (1966:496-497). The scientist Eddington's understanding of the location of his own sphere of expertise – “hard” science – in the broader milieu of understanding is remarkably philosophical for its nuance.⁵⁷ Whereas the philosopher Russell distances himself from the causal problem of being before him, it is the scientist Eddington who deems being as having paramount importance. This was the same insight Newton had more than two centuries before. From scientific study of observed phenomena, causes should be detected until science leads past itself to first – metaphysical – causes.⁵⁸ And to where shall we turn? We cannot seek an account of bringing into being from material changes that have themselves been given being and further beg the question by their existence. The only possible recourse is to a discipline wherein the “problem of creation” properly has space for discussion: a metaphysical causal account.

In a metaphysical, causal account of being – which includes all extant particulars studied by “hard” science – the explanation posed is not scientific. It is therefore not bound by the

scaffolding of these truths, only on the firm foundation of unyielding despair, can the soul's habitation henceforth be safely built” (Russell, [1910]1959:47-48).

⁵⁷ *“The problem of the scientific world is part of a broader problem—the problem of all experience. Experience may be regarded as a combination of self and environment, it being part of the problem to disentangle these two interacting components. Life, religion, knowledge, truth are all involved in this problem, some relating to the finding of ourselves, some to the finding of our environment from the experience confronting us. All of us in our lives have to make something of this problem; and it is an important condition that we who have to solve the problem are ourselves part of the problem” (Eddington, 1929:328).*

⁵⁸ In criticising philosophers who had solely sought mechanistic-type explanations for all things, Newton asserted:

“... [T]he main Business of natural Philosophy is to argue from Phaenomena without feigning Hypotheses, and to deduce Causes from Effects till we come to the very first Cause, which certainly is not mechanical; and not only to unfold the Mechanism of the World, but chiefly to resolve these and such like Questions” (1730:344).

parameters of “hard” science and its methodological requirements for either observation or verification. From the advent of the Enlightenment this has been the point most critiqued within metaphysics (Hume, [1748]2008:4, 86). The bounded nature of “hard” science, and its inability to account for being or causality – I have argued – demonstrate that being should be studied precisely in a non-empirical manner.

However, empirically untestable theoretical postulations cannot be corroborated utilising observational means, neither can they be falsified through experimentation. I therefore argue that what must be posited is a very different notion of causality. This is causality in the milieu of “*scientia*” rather than restricted “science”, which infers a form of causality not bound to empirical verification. It should be borne in mind that verification cannot touch on the metaphysical themes of being, causation, or creation, however.

According to scientific and physicalist theoretical approaches, causal metaphysics’ construction would be regarded as speculation and as unscientific. This is because according to their paradigms, no actual knowledge could emerge from the non-observable and non-empirically verifiable.

However, causal metaphysics does not seek to be science and so should not be judged by the standards of bounded science. Rather, I have articulated that configured as “*scientia*”, causal metaphysics is an attempt to construct knowledge that is reflective of the primary metaphysical problem that things are and should be accounted for.

5.4. Ever-continuing creation out of nothing:

“Is not physics perfectly able to supply all that is needed for the origin of the universe, and in a much more compelling and well-substantiated way than either philosophy or theology can?” (Stoeger, 2010a:174).

5.4.1. **Introduction:**

I argue that the “problem of creation” requires a meta-physical theory to aim towards obtaining hold of the complexity of creation, which is not solvable by the scientific methodology of observation, hypothesis construction, rigorous testing and theory development. But, metaphysics itself should not be assumed to provide an absolute account of being either. In a similar manner to scientific theories, those of metaphysics have been proposed, alternatives have countered these, and thus, development has occurred from its origins to the present moment.

All theoretical postulations should be understood as limited models of the entities about which they concern. That is, in the utilisation of a particular hypothesis or theory, language – or other symbolic means – is employed to *represent* the scrutinised entity to both the theory-creator and those who will employ the theory at a later juncture. Any theory that constructs a model of the *way the universe* – or a particular part thereof – is, *only models* the universe. So, while a scientific or philosophical theory may grasp the dimension of the object explored, in a limited sense, “... *they are not the reality they represent*” (Stoeger, 2010b:160). No theory is a copy of reality, but can only be a finite, human endeavour to comprehend the universe. Therefore, neither metaphysics nor “hard” science, as human constructs, can ever propose to *fully* answer the problem of why there is something rather than nothing (Stoeger, 2010a:180).⁵⁹ Instead, only best approximations are able to be given by both metaphysicians and empirical scientists (2010a:180).

Thus far we have proposed that hard science requires metaphysics to account for its being and for the existence of the entities of its study. This has never been an attempt to negate the importance of the findings of “hard” science. Rather, delineation has been sought between particular spheres of knowledge. In this manner, problems are responded to best by disciplines focused upon particular study.⁶⁰ When these multiple narratives are embroidered together they form an intricate and detailed tapestry of knowledge (“*scientia*”). But only when different modes of enquiry are placed in complementary relationships can the human limitedly grasp the magnificence of the universe within which she finds herself.

Having explored scientific cosmology, we now push forth – after the *scientia* approach – to philosophical cosmology. Both the marked difference and complementarity between the two forms of cosmological study rests in their unified exploration of the same cosmos, albeit from differing perspectives. Whilst scientific cosmology is obliged to remain within empirically observable space-time, philosophical cosmology – as a non-empirical *scientia*

⁵⁹ Although Aquinas argued that reason demonstrates that creation occurred – in the philosophical sense of creation – it is the author’s contention that the limits of human understanding should be borne in mind (Aquinas, *Commentary on the Sentences*, II, distinction 1, Q. 1, A. 2 in Baldner & Carroll, 1997:74). In this sense, the possibility of the humanly knowable remains, humbly, at a partial disjuncture from being.

⁶⁰ Physical science, for instance, has as its subject the composition, interactions, changes, etc., of material entities, thus, particular objects, whereas metaphysics considers universal themes, ultimate questions, etc. (Stoeger, 2010b:153).

– may explore reasonable accounts of the contingent cosmos both from within the universe and outside it. However, that metaphysical cosmology transcends the limits of physical reality does not imply that the metaphysical narrative should be incompatible with that of scientific cosmology (Carr, 2006:154). Moreover, it should also not infer that any fictive metaphysical account – irreconcilable with the best of current scientific cosmology – should pass muster. Scientific cosmology, therefore, is the testing ground for metaphysical cosmological narratives, such that only the attuned should be retained.

Fascinated by the conditions required for the original moments of the cosmos' primordial event, scientific cosmologists face the wanting need that there is not the empirical data extant to explore the coming into being of the universe (2006:139). Furthermore, physical theories like quantum cosmology – which deal with the “ground” of the emergence of the cosmos – do not account for existence. After all, a change in form out of a quantum vacuum into a material universe only begs the question of its being.⁶¹ Whereas scientific cosmology provides masses of data concerning the evolution of the cosmos, it is incapable of putting forth a theory for its “creation” (Stoeger, 2010b:152, 168). Therefore, a metaphysical solution to the “problem of creation” has the potential to bear light upon the limits of the explanatory power of scientific cosmology:

“... [‘Hard’ science] *can never tell us how we get from absolutely nothing – nothing like space or time, matter or energy, wavefunction or field, nothing physical at all – to something that has a particular order... [Moreover, it] cannot help us in illuminating the ultimate ground... of being*” (Stoeger, 2010b:169).

The proposal here is not for metaphysics to replace science. Metaphysics does not become a proxy for science’s models of the way the cosmos is because science does not provide a substitute metaphysical narrative for being (Stoeger, 2010a:180-181). In essence, the only acceptable cosmological model binds causal being’s emergence with empirically well supported and accepted theories of hard science (Stoeger, 2010a:180).

5.4.2. **Defining “creation”:**

The Western intellectual tradition comprises numerous metaphysical cosmologies, both philosophical and theological. Additionally, almost all cultural groups have cosmological narratives. But, this work is concerned with transposing the thought of Saint Thomas Aquinas to contemporary Philosophical scholarship. Amidst the author’s reasons for

⁶¹ It will be recalled that creation is not change (Aquinas, *Contra Gentiles*, II, Ch. 17, §2).

choosing Saint Thomas, is the broadness of the philosophical cosmology he developed. A previously mentioned criterion for a metaphysical cosmology was that it should not contradict the best available scientific cosmology of its day. In researching multiple cosmologies, Saint Thomas' is a particularly suitable candidate because whether scientific cosmology postulates a finite or an infinite universe or multiverse, the Thomistic emphasis upon the emergence of being holds fast without contradicting current cosmological hard science.

Though metaphysical cosmology is commonly understood to imply the concept of "creation", it has been long argued that there is no evidence for the act of creation in any existing creature (Aquinas, *Summa Theologica*, I, Q. 45, A. 3). From Aquinas' perspective, however, the evidence for the event of creation in any creature lies in the existence of that creature (I, Q. 45, A. 3). He explains this through the comparison of generation with creation (*Summa Theologica*, I, Q. 45, A. 3, Kretzmann, [1999]2001:81). In the former, the potential which could be actualised within the substance exists within the substance (Aquinas, *Summa Theologica*, I, Q. 45, A. 3). No one could argue, for example, that between the innate potential of the material cause and that of the efficient cause, that the final cause of the statue of David, carved out of marble through Michelangelo's action, was not present. If then, in the case of making something, the thing to be generated is present, so greater it is for Aquinas that creation is present in the being of the thing (I, Q. 45, A. 3).⁶² For, in something created, the potential for the creation of the thing was not prior to the creation, since there was no substance within which to contain potential actualisation (I, Q. 45, A. 3).⁶³ Without the potential present in the substance for its creation, but with the presence of the actualised creation in the creature, creation is present in the principle of the being of the thing itself (I, Q. 45, A. 3). The Thomist definition of creation, which we will shortly meet, touches on this further.

Deliberation of the Thomist definition brings to the fore its compatibility with "hard" science. And whilst a very strong statement, it can be asserted that no scientific cosmology can provide empirical evidence which falsifies the claim made. Moreover, the metaphysical declaration on creation – with its ontological focus – does not make a

⁶² "... [J]ust as art work presupposes a work of nature, so does a work of nature presuppose the work of... the creator. In fact, the material for art products comes from nature, while that of natural products comes through creation" (Aquinas, *Contra Gentiles*, III, Ch. 65, §6).

⁶³ "Every change is a move from that to this... [c]reating, though has only one" (Kretzmann, [1999]2001:82).

scientific assertion, for there is not the empirical evidence available for scientific cosmology to make such claims.

“... [T]o create means nothing else than to bring something into being without any pre-existing matter” (Saint Thomas Aquinas, *Contra Gentiles*, II, Ch. 16, §13).⁶⁴

In its coarsest form, the solution to the primordial metaphysical question lies in the bringing about of being, present by the fact of existence: straightforwardly, the act of creation. Something exists because it has been ascribed being which could not come from itself nor from any other extant temporal being! Prior to its being, the thing was not (i.e. it did not have being, therefore it was “no-thing”) (I, Q. 45, A. 1). Causality – in this sense the bringing about of being from not-being, rather than cause A results in effect B – must be ascribed to another cause outside of particular being, a cause that brings about all being.

If causality were considered in terms of generation as opposed to creation, an infinite regress argument would be applicable. Cause would bring about cause, which in its turn would bring about cause in an existing entity generating a new entity, *ad infinitum*.

“... [T]he craftsman works from natural things, as wood or brass, which are caused not by the action of art, but by the action of nature. So also nature itself causes natural things as regards their form, but presupposes matter” (I, Q. 45, A. 2).

Without the existence of material entities, there could be no presupposed matter from which either natural causes or any other causes could work on to result in an effect (I, Q. 45, A. 2). What brings these causal entities – in the secondary sense – forth into existence? From “not-being” a causal “quantum” leap must have occurred in the bringing about of being (I, Q. 45, A. 1).⁶⁵ Saint Thomas defines this event:

“... [C]reation... is the emanation of all being... from... ‘not-being’ which is ‘nothing’” (I, Q. 45, A. 1).⁶⁶

⁶⁴ The theoretical postulation of *creatio ex nihilo* is not a Thomist coinage. As will be explored, its history goes to the earliest reaches of Christendom. Saint Thomas acknowledged that the formulation of creation he uses comes from the Englishman, Bede the Venerable (672/3 – 735) (Aquinas, *De Potentia*, Q. 3, A. 1).

⁶⁵ The term “quantum” is used here analogically.

⁶⁶ Saint Thomas defines “nothing” as “not-being” (Aquinas, *Summa Theologica*, I, Q.45, A.1).

Creation is not as physics would postulate as cause-effect in time, but an eternally ever-present, relational action which brings forth and sustains being in entities rather than in not-being throughout time (Kretzmann, [1999]2001:84, Stoeger, 2010a:181). Creation is thus conceptualised as an on-going ontological action: unless being has been ascribed by the emanatory Being, there could only be “not being”, nothingness (Aquinas, *Summa Theologica*, I, Q. 45, A. 2).⁶⁷ Rather than “not-being”, the human is at all moments faced with the richness of being, encountered from the macro to the nano-levels of *created* reality. Thomistically, the creative act is one of relationship, present in experienced being, for as Saint Thomas declares:

“... [C]reation in the creature is... a... relation to the Creator as to the principle of its being” (I, Q.45, A.3).

Even in the thirteenth century, a number of arguments against creation – based in the assumption that creation is merely a change – abounded.⁶⁸ Amongst these were the positions that creation is but a change from not-being to being and that since it is a change, creation must happen within a thing (Aquinas, *Contra Gentiles*, II, Ch. 18, §1).

As was demonstrated in the preceding chapter, Aquinas did not envisage creation as a change. We will not return to what has already been argued. But, Aquinas acknowledges that creation may appear as a change to the thinking subject because a particular entity that now has being was changed from when it did not have being (II, Ch. 18, §3).

To further his position, Saint Thomas argues that because creation is bringing into being from nothing it is relational; the thing created is utterly dependent upon the creative action for its own being (II, Ch. 18, §2). Now Aquinas proposes: if creation is a continual relational act, then creation is as real as the relationship held between creation and the thing dependent for its being (II, Ch. 18, §4).

⁶⁷ “... [I]n creation... the same thing can be taken as different now and before... so that a thing is understood as first not existing at all, and afterwards as existing” (Aquinas, *Summa Theologica*, I, Q. 45, A. 2).

⁶⁸ “... [There are] those who impugn creation by arguments derived from the nature of motion or change” (Saint Thomas Aquinas, *Contra Gentiles*, II, Ch. 18, §1).

5.4.3. ***The contingent processes of creation:***

5.4.3.1. The problematic processes of creation:

If the universe comes into being from some cause, by what dynamics does all that is emerge? I will argue that creation occurs via two discrete but interrelated philosophical processes that are the actions of a cause: creation out of nothing (*creatio ex nihilo*) and continuing creation (*creatio continua*).

Despite the evidence that scientific cosmology cannot adequately account for the emergence of being, it has been fervently argued by positivistically and scientifically inclined scholars that scientific cosmology can explain coming into being without appeal to any cause extra to the physical. Among such proposals, the Hartle-Hawking “no boundary” cosmological model is a favourite atheistic foundation in that it is paraded as a universe created out of nothing (*ex nihilo*), i.e. without cause (Stoeger, 2010b:165).^{xi} This model can be interpreted as a straw man argument because the real causal problem is placed aside in focusing on the physicalist explanation of the beginning. But atheists have not provided reason for why the universe exists, focusing their arguments against theistic creator-cosmological arguments, instead.⁶⁹ Atheists thus need to – and can, in Smith’s view – argue “... *that contemporary physical cosmology can explain... the universe’s existence*” in utilising quantum cosmology.⁷⁰ The universe’s emergence is hence interpreted naturalistically with the direct purpose of demonstrating that there is no room for a creative act at all.^{71 72}

In Hartle and Hawking’s famous proposal the initial boundary conditions are removed as Quantum Cosmology puts forth the hypothesis that there is “... *no boundary*”, i.e. there is no initial point of the universe’s emergence (1983:2975). They argued that the probability of the universe’s existence is not determined by a vacuum, but solely on “... *the mathematical properties of possible universes*”.⁷³ From hypothetical mathematical properties, it is inferred that a likely account for the existence of the cosmos relies upon a natural law, “*the wave function of the universe*” (Hartle & Hawking, 1983, Smith, 1998).

⁶⁹ Smith, 1998.

⁷⁰ Smith, 1998.

⁷¹ Stenger, 2007.

⁷² This paper was published in a longer form as: Stenger, V.J. 2006. “A Scenario for a Natural Origin of Our Universe.”, *Philo*, 9(2), 93-102.

⁷³ Smith, 1998.

Without a boundary – a misconstrued “moment of creation” – there is no need for a Creator as the “problem of creation” is claimed to be solved:

“... [I]n principle, one can predict everything in the universe solely from physical laws. Thus, the long-standing ‘first cause’ problem intrinsic in cosmology has been dispelled” (Fang & Wu, [1986]1987:3).

There is no doubt or question about the efficacy of the finding of laws of nature through the employment of scientific methodology. But are we justified in accepting Smith’s dilemma?

“The moral of this story is that quantum cosmology and classical theism cannot both be true. One has two choices: become an atheist or else argue that science, in the form of quantum cosmology, is false. However, since Copernicus and Galileo, any time that religion has opposed science, religion has lost.”⁷⁴

The Hartle-Hawking model relies on extra-scientific idealism in the form of “Platonic realism”.⁷⁵ But what universe does their model correspond to, if not the only one for which there is any empirical evidence, our own? A hypothetical universe certainly does not account for the universe’s existence. How seriously can the argument that there was no creation be taken when the argument is not founded in the universe about which it originally was claimed that it concerns?

Apart from the fallacy posited above, the scientific attempt to solve the “problem of creation” by eliminating it is weakened by its hypothetical character. The existence of a probabilistic law that results in the being of the universe should itself be questioned: it does not at all remove creation, but only begs the question further.⁷⁶ Furthermore, the history of relations between science and faith has not been totally antagonistic. Certainly, our research into both Copernicus and Galileo reveals compatibility. Nevertheless, with this digression aside, I conclude that the Hawking-Hartle model is a failed reductionist attempt at solving the philosophical problem of existence by employing hypothetical mathematics, unrelated to the cosmos within which we have our being.

⁷⁴ Smith, 1998.

⁷⁵ Smith, 1998.

⁷⁶ “At the very least one needs the existence of the wavefunction of the universe and the ordered behavior described by the Wheeler-DeWitt equation... Where did these come from, or why are they as they are, rather than something else?” (Stoeger, 2010b:165).

The question remains: *How did everything emerge from nothing?*

5.4.3.2. Creatio ex nihilo and creatio continua:

The rich history of the Western metaphysical assertion that through the action of creation something emerges from nothing can be traced back to the roots of the Judaeo-Christian tradition. The first theme considered in Sacred Scripture is creation. McMullin puts forth that the Latin translation of scripture – the Vulgate of Saint Jerome – particularly emphasises the nothingness that was prior to the creative act (McMullin, 2010:14).

“In principio creavit Deus caelum et terram. Terra autem erat inanis et vacua” (Liber Genesis, 1:1-2).⁷⁷

Returning to the original Hebrew of the Torah, we read:

וַיֵּאָדָר אֱלֹהִים, בְּרֵאשִׁית בְּרֵאשִׁית הַשָּׁמַיִם, בְּרֵאשִׁית הָאָרֶץ.
וְהָאָרֶץ בְּרֵאשִׁית הָיְתָה תוֹהוּ וָבֹהוּ, (בְּרֵאשִׁית, 1:1-2).⁷⁸

More recent translations of the Scriptures into English have lost the sense of nothingness apparent in these earlier versions.^{xii} Nevertheless, the early Christian community – inspired by their faith in the Scriptures – held that prior to the act of creation, there was nothing at all (McMullin, 2010:14). The second century Christian Gnostic Basilides of Alexandria, was the first person – to our knowledge – to articulate the doctrine of creation out of nothing (McMullin, 2010:18).⁷⁹ The later second century Bishop of Antioch, Theophilus, further developed the notion of *creatio ex nihilo* in his *Apology to Autolyicum*, beginning from the perspective that an individual person and his parents had not always been, nor too, did the matter of which they were composed (McMullin, 2010:19, Theophilus, Book I, Ch. VIII [1885:183]). Thus, Theophilus twice professes that all things are created out of nothing.⁸⁰

In the early third century, Saint Irenaeus of Lyon further commented on creation out of nothing in his arguments contra the Gnostics (McMullin, 2010:20). Irenaeus drew attention

⁷⁷ Where *“inanis et vacua”* can be literally translated as *“without form and void”*.

⁷⁸ Where *“תוהו וָבֹהוּ”* can be literally translated as *“unformed and void”*.

⁷⁹ Basilides’ thoughts are cited by Hippolytus Romanus:

“Since, therefore, ‘nothing’ existed... not matter, nor substance, nor what is insubstantial... God... willed to create a world...” (Book VII, Ch. IX [1885:271]).

⁸⁰ Theophilus, Book I, Ch. X (1885:204) and Ch. XIII (1885:209).

to the difference between the human generating something whilst God could bring forth something from nothing, in so doing, emphasising the disparity between the created and the creator (II, X, §4 [1885:964]).

“...[T]here is one God Almighty, who made all things... and fashioned and formed, out of that which had no existence, all things which exist” (I, XXII, §1 [1885:964]).

Yet another Church Father to have embraced creation out of nothing was the North African Saint Augustine of Hippo, who gives considerable attention to the relationship between time and creation in the *Confessions*.⁸¹ ⁸² Augustine gives *creatio ex nihilo* a new dimension in arguing that prior to the creation of time there was no creation of creatures for space and time are merged into one creative act:

“... [T]here could be no time without a created world... [and] the eternal Creator of all times art before all times and that no times are coeternal with thee...” (Confessions, XI, 30[40]).

By the time Saint Thomas Aquinas embarked on his ecclesiastical-academic career, the doctrine of *creatio ex nihilo* had been steadfastly established within the West. However, the Greek philosophical tradition stood at odds with *creatio ex nihilo*, in particular with its construal that the universe was eternal rather than time-bound (Baldner & Carroll, 1997:5). With the re-exposure of the West to the works of Aristotle, Saint Thomas had to face what had been put forth as eternal Aristotelian cosmology.^{xiii} Indeed, from the earliest centuries of the Church, the Hellenistic notion of an eternal cosmos had been a point of difficulty for the Fathers of the Church (1997:5).

The Aristotelian line of argument had argued that something must be in order for something else to emerge (*De Potentia*, Q. 3, A. 1).⁸³ Saint Thomas' solution to the perceived problem for Christian philosophy and theology was an in-depth consideration of the position that God cannot create (Q. 3, A. 1).⁸⁴ In order to fully grasp the complex discussion of Aquinas, we will explore only a few of the disputes he considered, which we consider to collectively encapsulate the entire argument against *creatio ex nihilo*.

⁸¹ “... [I]t was thou, O Lord, who didst create something and that out of nothing” (Saint Augustine of Hippo, *Confessions*, XII, 7(7), [(397-398)1955:211]).

⁸² cf. Saint Augustine of Hippo, *Confessions*, Book XI, Chapters 11-30 and Book XI, Chapters 7-9.

⁸³ “... [N]othing can be said... to come from what is not” (Aristotle, *Physics*, Book I, Ch. 8).

⁸⁴ Saint Thomas Aquinas, *De Potentia*, Q. 3, A. 1, §1-17.

In the first instance, nothing can be said to emerge from nothing-ness, because it is only ever possible for something to emerge from something which is extant (Q. 3, A. 1, §2). This is so for the potential to make something can only ever be a part of a subject (Q. 3, A. 1, §2). In essence, potential is either innate or there is no potential. Potential cannot exist on its own. The potentiality to be actualised, moreover, could not be actualised via the act of an agent if there is no material upon which to actualise the causing motion (Q. 3, A. 1, §7).

Aristotle also argued that the variance between the nature of a creator and the nature of the uncreated potential matter is too great for anything non-existent to be brought into existence (Q. 3, A. 1, §4).

“... [I]t is a law of nature that body is affected by body, flavour by flavour, colour by colour... in general what belongs to any kind by a member of the same kind...” (Aristotle, *On Generation and Corruption*, I[7]).

Now, if time is dense, there is an instant, a “*mean*” between the point of not-being and that of being, where both being and not-being are simultaneously true (Aquinas, *De Potentia*, Q. 3, A. 1, §10). However, both cannot be true, an entity cannot have both being and not-being (Q. 3, A. 1, §10). Therefore, things could not have been created out of nothing (Q. 3, A. 1, §10).

Finally, the conceptualisation of what “nothing” is brings about a counter to the possibility of creation out of nothing (Q. 3, A. 1, §17). If it is that out of nothing something is created, not-being – nothingness – is given being (Q. 3, A. 1, §17). Then it follows that out of nothing, nothing is created (Q. 3, A. 1, §17). If things do exist, then nothingness could not have been what preceded the created, or only nothing would have being (Q. 3, A. 1, §17).

Of course, to all of these objections founded in substance and time, Saint Thomas argues to answer the primordial metaphysical problem. On his terms, all things must be *created out of nothing*, not made from any pre-existing matter whose existence itself can be called into question (Aquinas, *Contra Gentiles*, Book II, Ch. 16, §1, *De Potentia*, Q. 3, A. 1).⁸⁵ So firmly did Aquinas hold this that he controversially argued – contrary to the common interpretation that Aristotle had disputed creation in *Physics*, Book I, Ch. 8 – that he had

⁸⁵ “... [T]o create is to make a thing from nothing. *Therefore God can make a thing from nothing*” (Aquinas, *De Potentia*, Q. 3, A. 1).

in fact argued in favour of creation.⁸⁶ To get around the problem of an eternal cosmos, Saint Thomas did not determine that an eternal cosmos removed the possibility of creation, which was a perspective held by other Christian philosophers of his time.⁸⁷ Aquinas' stance emerged from his theory of "*creatio continua*", that is, that the act of creation occurs at all moments of the existence of any particular thing that has being, dependent as it is for its being upon God (*Summa Theologica*, I, Q. 104, A. 1, *Contra Gentiles*, III, Ch. 65, §1).^{xiv} This theory will be considered further on in this chapter.

Nevertheless, I digress. To return to the initial consideration at hand, upon examination of all particular things that have being, it can be asserted that each thing is made from a substantial cause and by an efficient cause (among others). A marble statue, for example, is made through the act of the artist from stone. The being of the substantial cause demands examination: what has caused it to be? From the Thomist viewpoint, an efficient cause – the agent of an action – brings about the production of something else from matter to make something, but has *not created* that new thing (*Contra Gentiles*, Book II, Ch. 16, §3). Our sculptor has *not created* anything, but has *made* something new out of pre-existing matter. The sculptor is the maker of the particular form of the matter, but is not its creator, for she has utilised what was available for her to use in accord with her own nature.⁸⁸

Every actable agent within the cosmos can only act in accord with that particular agent's nature (Aquinas, *De Potentia*, Q. 3, A. 1). Its substance thereby limits its potential to act in particular ways. The sculptor cannot make it rain, a fire is not able to knit a jersey, as examples.

“... [E]ach one [i.e. particular agent] has an act confined to one genus and one species, so that none has an activity extending to being as such, but only to this or that being as such, and confined to this or that species: for an agent produces its like” (Q. 3, A. 1).⁸⁹

⁸⁶ “... [J]ust as some things are always true and yet have a cause of their truth, so Aristotle understood that there are some eternal beings... which nevertheless have a cause of existence. From this it is evident that although Aristotle posited a world that was eternal, he did not believe that God is not the world's cause of existence but of its motion only, as some maintained” (Aquinas, *Physics*, VIII, Lecture 2, §996).

⁸⁷ Carroll, 1998.

⁸⁸ “... [A] natural agent... determines a pre-existent being to this or that species... Wherefore the natural agent acts by moving something, and consequently requires matter as a subject of change or movement, and thus it cannot make a thing out of nothing” (Aquinas, *De Potentia*, Q. 3, A. 1).

⁸⁹ Or, we may clarify, the like to which that particular agent has the potential to produce.

In the process of making – that is, of moving or changing matter – there is no bringing about of being, as this is beyond the natural ability of any particular agent that cannot create substance (Aquinas, *Contra Gentiles*, Book II, Ch. 16, §5). If movement or change does not result in the generation of substance, the question of why anything of substance exists – i.e. anything with being – remains (II, Ch. 16, §4).

If substance itself limits what an agent is capable of potentially bringing about, an account of why there is something rather than nothing at all needs to overcome substantial limitations in terms of potential. Hence, Saint Thomas' solution is in his definition of the Being itself who brings about the action of creation:

*“... [It] is all act... without any admixture of potentiality... he is the source of all things... by his action he produces the whole subsistent being without anything having existed before (since he is the source of all being)... For this reason he can make a thing from nothing, and this action of his is called creation” (Aquinas, *De Potentia*, Q. 3, A. 1).⁹⁰*

The creative act does not come from a Being with potential – which would require substance to hold that potential in place – that is limited by the nature of its potential, things can indeed be brought forth from nothing, by a Being that is only Action (Q. 3, A. 1). The bringing into being is the active moment for all beings from whence their existence can be traced, this is primary causation (Q. 3, A. 1). After something has been ascribed being, whatever is extra to the bringing about of being, such as the shaping of marble into a statue, belongs to the causal action of secondary causes, that is of particular agents as opposed to the Universal Agent that brings about all that exists (Q. 3, A. 1).

From this understanding, Saint Thomas' cosmology does not interfere at all with the findings of contemporary science. The processes whereby the cosmos and all that are contained therein operate, evolve, etc., are secondary causes, whose existence is solely due to the primal act of the First Cause which has brought them into existence in the creation of substance *ex nihilo*. It is relevant to recall that for any of the physical processes underlying the functioning of the cosmos to be, substance must itself be present. The cosmological constant only operates, for instance, within the bounds of space and time, i.e. substance. Contrary therefore to the ancients who sought the *arché* – the eternal primary substance – Saint Thomas has argued for the contingent nature of substance

⁹⁰ Saint Thomas has made a leap here, for he has defined the source of the creative act as “God”. However, it would be well for us at this juncture to simply read this as his granting a pronoun to a postulated being. Establishment in detail of why “God” needs to be labelled as creator will follow in the subsequent chapter.

rather than simply empowering substantial existence to beg the question (*Contra Gentiles*, Book II, Ch. 16, §14).

While a “God-of-the-gaps” type argument is often postulated as providing “evidence” for the existence of God via a creative act, it should be held in mind that the initial singularity cannot be postulated as the *beginning* of all that is (Stoeger, 2010b:159).^{xv} Indeed, for the “initial” singularity to have occurred there was of necessity pre-existing conditions. If indeed, the singularity was but a part of a greater chain of causal events which produced the cosmos in its present form, the initial singularity was not *the* moment of creation. From a Thomist view, it was but *a* moment of creation, a point amongst a myriad of others in which the being of substance was held: albeit a fundamental one! If the apologetical task of seeking proof for God’s existence is so required, perhaps scholars should rather look at the fact that being is, as opposed to attempting to postulate a causal moment from the findings of “hard” science. It is of fundamental importance to recall that:

“... [P]hysics and cosmology are [not] capable of providing an ultimate explanation for the universe and its principle features” (Stoeger, 2010b:159).

But, as repeatedly touched upon throughout this work, this is in principle not their essential task. A complementary model – such as that of Thomist cosmology – fills this gap via a causal narrative of creation that is not in opposition to hard science. The innate reason for this is that the causal reasoning given does not contradict any finding of science, for it is not a scientific theory but a metaphysical one (Stoeger, 2010b:169, 173-174). Hence, as non-science, metaphysics does not seek to replace scientific accounts of physical reality (Stoeger, 2010b:169).

“... [Causal metaphysics of creation] simply provides an explanation for the existence and basic order of whatever the sciences reveal” (Stoeger, 2010b:169).

As mentioned, some contemporary cosmologists have wanted to disprove the possibility of the existence of a Creative Agent within the cosmos by virtue of the hypothesised eternity thereof.⁹¹ Indeed, Aquinas, too, confronted the possibility of a cosmos that had always existed (*De Potentia*, Q. 3, A. 17). What will be posited, though, is that the possibility of the eternity of the universe does not negate creation for being still is.

⁹¹ cf. Hartle & Hawking, 1983, Hawking, 2010, etc.

Aquinas considers Psuedo-Dionysius the Areopagite, a sixth century Greek scholar – attributed with composing the “*De Coelesti Hierarchia*” (“*Celestial Hierarchy*”) – who proposed that God has always been good, and from His goodness creation comes (*De Potentia*, Q. 3, A. 17, §2).⁹² But, the creation seems to have been eternal, from Pseudo-Dionysius, as the same goodness of the creator is eternal (Q. 3, A. 17, §2).⁹³

Saint Thomas infers that if the Primary Cause’s nature, will and power are eternal, from this will things of substance came to be, then they too must be eternal in accord with the way of being of a creative enactor (Q. 3, A. 17, §9). Furthermore, if the universe could potentially have been brought into being, it would imply, too, that there was substance out of which the potentiality present could in fact be brought (Q. 3, A. 17, §10).^{94 95}

Again, every moment of time is perpetually in a state of beginning of what is to be, and simultaneously ending what has been: thus time is always becoming and always ending (*De Potentia*, Q.III, A.17, §15). At all moments, time simply is an eternal occurring reality of being (*De Potentia*, Q.III, A.17, §15). Thus, it has always existed for there was no beginning or end, only constant beginnings and endings.

Aristotle offers a compelling argument for the eternity of the universe: from motion (*Physics*, Book VIII, Ch. I). If the efficient cause of all that is acts through a recessive chain of causal events – where motion has resulted in motion – it must be concluded that there was always motion resulting in motion preceded by more such events (Aquinas, *De Potentia*, Q. 3, A. 7).⁹⁶ Nevertheless, the regress into eternity does not provide a causal account that touches on why there is anything at all.

⁹² “... [T]he superessential Deity, having through His Goodness established the subsistence of all, brought all things into being. For it is the very nature of that God which is the Supreme Cause of all to call all things to participation in Itself in proportion to the capacity and nature of each” (Psuedo-Dionysius, *Celestial Hierarchy*, Ch. IV).

⁹³ For, as Saint Augustine proposed:

“... [T]he will and power of God are God himself” (*The Confessions*, Book VII, Ch. 4 [(397-398)1955:100]).

⁹⁴ “... [I]f before the world actually existed it was possible for it to exist, we must infer that the world was brought from potentiality to actuality, and consequently that matter preceded and was eternal...” (Aquinas, *De Potentia*, Q. 3, A. 17, §11).

⁹⁵ Whilst Hawking, Hartle and those of their ilk, have attempted to demonstrate that eternity removes the possibility of dependence upon a creator, neither Psuedo-Dionysius not Augustine postulate this. Indeed, their eternal cosmos models image the hypothesised eternal existence of being as created.

⁹⁶ “... [T]here never was a time when there was not motion, and never will be a time when there will not be motion” (Aristotle, *Physics*, Book VIII, Ch. 1).

For Aquinas, the existence of the universe is not coterminous with that of the creative agent; rather, the enactor of creation precedes the universe “... *as a cause precedes its effect*” (Q. 3, A. 7). His argument is founded upon an interesting scientific statement, with relevance, too, to contemporary cosmology:

“... [T]he world has not always existed. This cannot be disproved by any physical demonstration” (Q. 3, A. 7).

This assertion is supported by the bounded nature of science, in terms of what the scientist can come to know such as in the empirical evidence of the earliest moments of the cosmos (such as the mystique around the Planck era and before). Furthermore, cosmological models like the Hartle-Hawking one, support Aquinas’ position that science cannot actually show that the universe is materially eternal.⁹⁷ Moreover, in eternal models of the universe, it is oft assumed that the eternity of matter removes the requirement for the act of creation: things simply were.⁹⁸ But, argues Aquinas, such models do not provide any “... *reason... for the particular disposition of the universe...*”, let alone for its being (Q. 3, A. 7).

More contemporary eternity-type arguments, do not pay steady attention to the clear scientific theory that – as earlier touched on – time and space form one singular continuum. Hence, just as the primordial metaphysical question refers to the existence of substance, so too, it bears weight on the existence of time. Concurrent with space, time’s being needs to be questioned, and attempts should be made to respond to why time itself has being. Moreover, for things to exist in eternity, they of necessity exist within the space-time continuum:

“... [T]ime is included in the universality of the things made...” (Q. 3, A. 7).

Hence, even in an eternal cosmos where there is no “beginning of creation” in an initial singularity at $t=0$, the requirement for the explication of the evident being of substance in time is not removed. Things still have being within an eternal universe and their being

⁹⁷ One will recall that the previous discussion of the Hartle-Hawking cosmological model eluded to the employment of imaginary mathematical constructs which did not accurately reflect the being of the cosmological entities considered by the particular enquiry of these mathematical cosmologists.

⁹⁸ A similar case was true of the Ionian cosmologists who assumed that matter was both eternal and not created in their hunt for primordial matter (Aquinas, *De Potentia*, Q. 3, A. 7). The question of why there was something rather than nothing has yet again remained unanswered.

begs the question of why they have existence. If the act of creation is, as we have proposed, not explicitly coupled with the initial singularity – argued as one among many cosmological models or denied altogether in an eternal cosmos – the event was merely a singular act in the history of the cosmos’ *making*. The Thomist doctrine of *creatio ex nihilo*, however, is not explicitly bound up with a cosmological model that holds the initial singularity as the beginning point of all that is. Instead, the theory’s true importance is as a description of why any experienced substance has being at all as a consequence of the act of creation. In an essential way, the creative act is necessary for all substance to be, but substance is not necessary for the creative act to be (Stoeger, 2010b:170).

In postulating the necessity of the creative act, Saint Thomas rejects the Ancient Greek thinkers’ assumption that nothing is able to come from nothing, that is, that there must be substance before potentiality can be actualised, as noted previously (*Contra Gentiles*, Book II, Ch. 16, §14, Kretzmann, [1999]2001:85).⁹⁹ It must be acknowledged that the starting point of the ancients – i.e. the considerations of the making of particulars (like our marble statue) – is true: nothing can arise without some substance pre-existing (Aquinas, *Contra Gentiles*, Book II, Ch. 37, §2). Later philosophy enriched the discussion through consideration of the emergence of things from substance more generally, until finally the more universal problem of the being of substance itself became primary (II, Ch. 37, §3). Herein arises the problem – not of making from substance – but of the creation of substance itself, which cannot come from another substance:

“... [T]he word *making* implies motion... whereas in the origination of all being from one first, the transmutation of one being into another is... inconceivable” (*Contra Gentiles*, Book II, Ch. 37, §3).

Saint Thomas shifted direction in the consideration of causality from Aristotle’s study of physical nature into the metaphysics of the problem that any substance has being (Kretzmann, [1999]2001:86). The posited explanation does not contradict the physical law that nothing comes from nothing, however. For, being of a metaphysical variety, the account need not conform to the physical law since bringing into being is not a dimension of reality controlled by physical laws; instead physical laws are contingent upon being

⁹⁹ “... [W]e refute the error of the ancient philosophers who asserted that matter has no cause whatsoever, for they perceived that in the actions of particular agents there is always an antecedent subject underlying the action; and from this observation they assumed the opinion common to all, that from nothing, comes nothing. Now, indeed, this is true of particular agents. But the ancient philosophers had not yet attained to the knowledge of the universal agent which is productive of the total being, and for His action necessarily presupposes nothing whatever” (Aquinas, *Contra Gentiles*, Book II, Ch. 16, §14).

(*Contra Gentiles*, Book II, Ch. 37, §6).¹⁰⁰ Thus, in the face of scientifically dominated surrounds, the causal metaphysician has the audacity to assert:

“... [T]his ultimate ground of being... is not another entity or process in the universe, which can be discerned or isolated from other physical and causal factors... It is not scientifically accessible!... [I]t is causally distinct from them, because without it, nothing would exist... [I]t endows them [physical substance and laws] with existence...” (Stoeger, 2010b:170).

It is only natural that “dyeed in the wool” materialists and more specifically, the scientifically-inclined, will take issue. At the heart of the gamut of counterarguments is that within a scientifically dominated world, empirical explanation should be the sole yardstick by which any potential fact is measured (Stoeger, 2010b:170). No metaphysical position is verifiable, and hence, the *ex nihilo* creation argument lacks weight! However, as has been argued in earlier chapters, this position rests upon the assumption that scientific methodology provides the sole route to reliable knowledge (Stoeger, 2010b:171). Therefore, however, it is an approach that transcends what it itself is capable of proving.

Yet a further argument against *ex nihilo* creation is that seeking a metaphysical foundation for reality results in meaningless statements (Stoeger, 2010b:171).¹⁰¹ From the arguments presented thus far, it would seem rather meaningful and reasonable to assert the likelihood of a ground of being, because the scientific no-cause argument simply negates the cosmological problem of causality present in every moment of being. The transcendent knowledge to which metaphysics leads, however, is never something adequately graspable, most especially because it lacks substantiality (Stoeger, 2010b:172).

Finally, *ex nihilo* creation may be viewed as “*metaphysically incoherent*” (Stoeger, 2010b:174). After all, *ex nihilo* does put forward that whilst uncreated substance cannot be, an eternal and uncreated Enactor of being – unlike any other being in its nature that is pure action – is the ground of being. The rather unsatisfying response is that the agent of creation is simply so different to the experienced in its essence that description – which must always be analogical – cannot account for it (Stoeger, 2010b:174). The conundrum

¹⁰⁰ “... [I]n things made by way of motion, to be made and to be are not simultaneous...” (Aquinas, *Contra Gentiles*, Book II, Ch. 37, §6).

¹⁰¹ This position finds added weight in the earlier considered arguments of Wittgenstein, whereby he categorically asserts the meaninglessness of metaphysical statements in the *Tractatus* (1922:90).

of the problem of existence is that being, for which an explanation is sought, directs beyond its own existence to causality that is transcendent of the human experience of phenomena.

In cosmological models of the eternal-variety, amidst others, no account is made for the existence of anything at all: both matter and processual “laws of nature” are simply extant. This is, though, not the case in the *ex nihilo* model. Remaining within the bounds of metaphysics rather than interfering with the findings of empirical science, the causal account demonstrated “... complements our quest for understanding and explanation of origins...” (Stoeger, 2010b:175). This complementarity between metaphysics and hard science is perhaps more readily accessible within cosmological models that posit a beginning of space-time, such as in the standard model. However, since, from the perspective of quantum cosmology, the singularity is not the beginning of the cosmos, caution must be observed. The ground of being argument which has been presented, hence, does not postulate any particular event as the moment of creation. Instead, the conjectured relation between the emergence of being (creation) and any extant phenomena resides in the continued existence of things requiring rationalisation for being, an explanation outside the possibility of science’s explanatory power. Indeed, this is the strength of the *ex nihilo* argument, for it responds to the metaphysical problem at the core of this discussion in postulating the “... ontological origin of reality...”, in the form that all which exists is dependent upon the continuing act of creation (Stoeger, 2010b:172).

The hypothesis that creation continues in being is contested, as Saint Thomas was well aware.¹⁰² It was proposed, for instance that because there are beings that by their nature cannot not have being that they simply are; their being is not dependent (*Summa Theologica*, I, Q. 104, A. 1).¹⁰³ In these instances with being there are no possible instances where there is the potential for their existence not to be (I, Q. 104, A. 1). Even in the case of a particular entity that dies, there is no possibility of the substance out of which the corpse is made retreating into not-being. Of course, the form changes, but the matter remains. Additionally, there were arguments that for a natural entity to have being implies it is not natural for the same entity to not have being (I, Q. 104, A. 1). However, following his path of faith and reason, Aquinas counters that all things remain in being as

¹⁰² cf. Aquinas, *Summa Theologica*, I, Q. 104, A. 1.

¹⁰³ “For what cannot not-be, does not need to be kept in being” (Aquinas, *Summa Theologica*, I, Q. 104, A. 1).

a result of the Enactor of being, the creator, who also has the task of preserving all things in being (*Summa Theologica*, I, Q. 104, A. 1, *Contra Gentiles*, III, Ch. 65, §1).¹⁰⁴

“... [N]either this man, nor any other univocal agent in nature, is the cause of anything except the generation of this or that thing” (*Contra Gentiles*, III, Ch. 65, §4).

Instead, any natural cause acts only on the primary substance that has already been ascribed being (*Contra Gentiles*, III, Ch. 65, §4). Hence, any natural cause can only be an actualiser of becoming within the pre-existing potential of created substance (III, Ch. 65, §5). The thing *is in time and space*, not by its own action or of any other natural agent, which cannot bring being forth.¹⁰⁵ For Aquinas, if the making of something is dependent upon the causal action of an agent – which if stopped will stop the making – so too does the existence of a thing cease if its cause ceases to bring it into being through time (*Summa Theologica*, I, Q. 104, A. 1).

Creation – the bringing something into being from not-being – is therefore not a one-off event in a primordial explosion (I, Q. 104, A. 1). It is the cause behind the *continued* existence of substance, the product of the Enactor which brought it into being through creation (*Contra Gentiles*, III, Ch. 65, §3). Thomistically, creation is a relational reality: the created is dependent for its existence upon the primary cause, but acted upon to be made into other forms by secondary causes (Stoeger, 2010b:172).¹⁰⁶

“... [The] *first cause has as much to do with sustaining as with bringing into existence, as much to do with explaining the continuing existence of things as with explaining their coming into existence*” (Kretzmann, [1999]2001:76).

¹⁰⁴ The theory of *creatio continua* (“continuing creation”) rests, like that of *creatio ex nihilo* on the Thomist distinction between primary and secondary causality.

¹⁰⁵ “... [N]o body is the cause of the being of anything...” (Aquinas, *Contra Gentiles*, III, Ch. 65, §5).

¹⁰⁶ Saint Thomas Aquinas gives the following example, akin to the author’s earlier example of the sculptor:

“... [A] builder causes the house in its ‘becoming,’ but he is not the direct cause of its being... [T]he being of a house depends on the... materials [out of which it is made], just as its ‘becoming’ depends on the action of the builder. The same principle applies to natural things. For if an agent is not the cause of a form... neither will it be directly the cause of ‘being’ which results from that form; but it will be the cause of the effect... [T]he ‘becoming’ of the effect, but not its ‘being,’ depends on the agent” (*Contra Gentiles*, III, Ch. 65).

5.5. The physicalist critique against a contemporary Thomist metaphysics of creation:

“... [Scholasticism] *has become obsolete [a] long time ago for being incompatible with modern science...*” (Mahner, 2012:1446).

The cosmological model in this chapter has focused upon reclaiming a philosophy of nature open to metaphysical speculation by returning to the sources of the corpus of Aquinas’ writings. The emphasis upon the thinking subject placing the object as primary has resulted in a model heavily laden with metaphysical themes: ontology is conceptualised as prior to epistemology, for in order to know anything there must be something which one can know. To found the known in the knowable, the latter needs justification for its existence; metaphysics of necessity – as was explored in the dealing with Kant – requires the completion of a circular argument: a meta-philosophical foundation.¹⁰⁷ Indeed, both the Humean and Kantian critique of metaphysics highlight the impossibility of knowing a thing in itself, that is, the metaphysician’s foundation of her philosophical enterprise. Metaphysics has thus the elusive Cartesian search for an irrefutable foundation as a requirement for its justification thrust upon it!

To whence shall the post-postmodern look? In the eyes of more – though they may deny it – positivistically inclined scholars, it is to science as the variety of methodical and systematic disciplines that expose the way that substantial things are (Mahner, 2012:1437). This alone is the sure path, for the sake of its reasoning, validation of hypotheses via rigorous testing, and consistent success (Ross, 1997:162, Ladyman *et al.*, 2007:1).¹⁰⁸ ^{xvi} Contemporary physicalists do not seek to do away with metaphysics, though, but to relocate it within the broader scientifically-based knowledge framework of the physical reality within time and space (Ladyman *et al.*, 2007:1, Mahner, 2012:1437).¹⁰⁹

According to physicalism, the sum-total of all things is physical (Witmer, 2006:558). This is a metaphysical position, of course, as it concerns a declaration of the nature of reality. Intriguingly though, the history of physicalism in relation to metaphysics is oppositional.

¹⁰⁷ Pihlström, 2006.

¹⁰⁸ Pihlström, 2006.

¹⁰⁹ “*Knowing one’s way around is... a form of ‘knowing how’ as contrasted with ‘knowing that’... [T]here is all the difference in the world between knowing that each step of a given proof in mathematics follows from the preceding steps, and knowing how to find a proof... It can be argued that anything which can be properly called ‘knowing how to do something’ presupposes a body of knowledge... [that is,] knowledge of truth or facts... [K]nowing one’s way around in the scheme of things, which is the aim of philosophy, presupposes a great deal of reflective knowledge of truths*” (Sellars, 1962:35).

For physicalism first emerged in late logical positivism as part of the project of removing the vagaries of metaphysics (2006:558). This was not, however, a position founded in the empirical research of “hard” science, but rather was a philosophical stance that assumed the absolute pre-eminence of observation and verification as central tenets of positivism (2006:558). Now, though, physicalism is an all-encompassing metaphysical narrative: all that is, is physical (2006:559).

While scholars like Quine, Ladyman, etc., claim that they are “naturalists”, it would be – in my estimation – more appropriate to class them as “physicalists” (Quine, 1969:126-127, 1981:21, Ladyman *et al.*, 2007:1-2). For whilst all physicalists are naturalists, it cannot be posited that all naturalists are physicalists. This is apparent from the complexities of current philosophy of mind (Stoljar, 2009).¹¹⁰

In its essential form, physicalism ascribes extra significance to physics as preeminent among all knowledge systems (Ladyman, 2007:39). For many scholars engaged in disciplines that are neither of the natural or physical sciences – let alone physics more specifically – this position may seem both extreme and insulting. The human experience of the cosmos is an outgrowth of irreducible complexity on multiple planes. Nevertheless, physicalists argue that testing for non-physical forces in the cosmos from the nineteenth century to the present have provided almost irrefutable support for physics’ primacy (2007:42). Ultimately, meticulous tests demonstrated that only physical forces exist, while no non-physical forces are detectable (2007:43). Hence the inference is drawn: the study of physical forces is solely triumphant, and whatever conflicts with it “... *should be rejected for that reason alone*” (2007:43-44).

Still Sellars contends that metaphysics is of relevance as it is a presupposition for methodologically initiated knowledge (1962:35). For physicalists, however, the form of metaphysics required as part of the human process of representing the world can only be legitimised within the praxis of “hard” science generally and physics specifically (Ladyman *et al.*, 2007:1-2). Knowledge systems that are not systematically informed by hard

¹¹⁰ From the perspective of Philosophy of Mind, it has been argued that physicalism is false (Stoljar, 2009). Cognitive ability and function emerge from the physical body of the human, of course. Thus, the mind must of necessity supervene upon the physical body (Stoljar, 2009). However, whilst physicalist in the sense of supervening, that cognition cannot be reduced solely to physical processes for the explanation of the *fullness* of the cognitive experience clarifies the matter. Here then, the physicalism asserted to is in a limited form as opposed to the absolutist physicalism accepted by Quine and Ladyman through their physicalist naturalism (Quine, 1969:126-127, 1981:21, Ladyman *et al.*, 2007:1-2, Stoljar, 2009).

science's models of the world are ultimately meaningless. The legacy of physicalism traces its roots to Hume's anti-metaphysical verificationist empiricism (Hume, [1748]2008:4, Ladyman *et al.*, 2007:304). It came to a head in Quine's thinking, for he indubitably embraced physicalism, construing philosophical study as coterminous with science alone (Quine, 1969:126-127, 1981:21). Indeed, Quine's delineation of a physicalist form of "naturalism" specifically attacks metaphysics in favour of the spirit of Humean verificationism:

"... [It is the] abandonment of the goal of a first philosophy. It sees natural science as an inquiry into reality, fallible and corrigible but not answerable to any supra-scientific tribunal, and not in need of any justification beyond observation and the hypothetico-deductive method" (1981:72).

As empirical in character, legitimate knowledge is to conform to the nature of testable explanations of observed phenomena where no extra-physical causes are appealed to (Ladyman *et al.*, 2007:1-2, 298, 310). Historically, this verificationist empiricism of physicalism is derived from the emergence of mathematics (2007:2). The level of abstraction of the mathematical enables removal of the thinking subject from the familiarity of the mundane (2007:2). Cognitively constructed, parochial representations are thus transcended that eventually led to abstract, scientific models of the world (2007:2). These, for the physicalist, contain non-cognitively construed data of the way that "... *fundamental structures of reality...*" are (Ladyman *et al.*, 2007:300, Mahner, 2012:1440).

"Since this knowledge can be incorporated into unified pictures, we can also have some justified metaphysics. [However, b]ased as it is on incomplete science... it is at least motivated by our most careful science... [therefore] it is the best metaphysics we can have..." (Ladyman *et al.*, 2007:3).

As preceding argumentation in this work has shown, countering a metaphysics informed by science is contrary to the metaphysics presented in this research. However, physicalism is problematic in its removal of metaphysics as the justification behind scientific activity (Quine, 1981:72).¹¹¹ For if metaphysics is grounded in science, in what is the existence of science grounded? If the physicalist would argue that science is founded in the dynamic between the engagement of the human with "... *fundamental structures of reality...*", these same structures require a foundation (Ladyman *et al.*, 2007:300). And, nothing less than a metaphysical position wherein ontology is articulated will suffice. Ladyman *et al.*'s response is that while metaphysics may be the foundation of

¹¹¹ "... [M]etaphysics... should... be based in science" (Ladyman *et al.*, 2007:6).

physicalist theories, these same foundations are reliant upon verified science (2007:7). Thus, tautologically, metaphysics enables science because science enables metaphysics.

Analysis of the argument presented reveals that it is circular. In proposing that physicalist science grounds metaphysics – although physicalism may have metaphysical presuppositions – and that these presuppositions are verified for validity only by science merely begs the question. Ultimately, the “world” as modelled by science becomes like “*autonomous metaphysics*”, causeless (Ladyman *et al.*, 2007:7).

For a physicalist, however, the problem of accounting for being is not a problem, as causelessness is accepted as scientifically tenable (Ladyman *et al.*, 2007:300). Treading the Humean-line, causation is defined as cognitive as opposed to related to the way in which things are (Ladyman *et al.*, 2007:300). Causality can only then be interpreted as a human imposition upon observed data, nothing more than an inference. While tenable as a philosophical position, seemingly practitioners of “hard” science would take issue with this postulation. What adds to this argument is Ladyman *et al.*'s contention that material objects do not exist in physics (2007:301).

“... [W]e are not concerned with preserving intuitions at all, and argue for the wholesale abandonment of those associated with the image of the world as composed of little things, and indeed of the more basic intuition that there must be something of which the world is made” (2007:12).

Whilst “objects” may be perceptual constructions on the part of humans, at a micro level they are extant collections of mutually relating subatomic entities, particles, and in some cases of symbiotic organisms, within the space-time continuum.¹¹² Collectively, an entity is formed in these interactions that is discrete from its constituent parts. Moreover, if physicalists will accept the existence of “*fundamental structures of reality*”, seemingly these require grounding, too (Ladyman *et al.*, 2007:300). If not, the problem of their being, demonstrated by the success of physical science, remains in an accounted for “limbo”.

From the non-physicalist perspective, metaphysicians have often been interpreted as turning to the empirically indefensible as the basis for their claims in esoteric notions like

¹¹² “*The unity of the universe of proportionate being is threefold... Its actual unity is an immanent intelligible order... Its formal unity is constituted by its successive levels of conjugate forms... Its potential unity is grounded... in the merely empirical conjunctions and successions that constitute the inexhaustible manifold of the merely coincidental that successive levels of forms and schemes bring under the intelligible control of system*” (Lonergan, [1957]1970:510).

being, God, etc. Heavy criticism has hence been laden from materialists, with the accusation that metaphysical foundationalism is uncritical supernaturalism (Mahner, 2012:1437). Empirical verificationism – the method at the core of physicalism – cannot be employed in metaphysics for observations are central to the action of science but not of metaphysics (Mahner, 2012:1441).¹¹³ It can be concluded then that when supernatural accounts are argued for, reliable knowledge alters its character such that the untestable is acceptable (2012:1447). Interior locutions or other forms of non-natural means of knowledge acquisition are even embraced as valid (2012:1446).

Is a supernatural foundation actually untestable by scientific means? Considering the supernatural agent, “God”, Stenger states:

*“We can consider the existence of God to be a scientific hypothesis and look for the empirical evidence that would follow. [This is because m]any of the attributes associated with the Judaic-Christian-Islamic God have specific consequences that can be tested empirically. Such a God is supposed to play a central role in the operation of the universe and the lives of humans. As a result, evidence for him should be readily detectable by scientific means”.*¹¹⁴

In effect, Stenger has reconceptualised the supernatural as natural by demanding conformity with natural laws and their associated tests. Moreover, the image of God portrayed is one whereby the Divine is detectable by gaps in explanation. This is apparent in his arguing that as contemporary cosmology explains the emergence of the cosmos – through various models, whether quantum, multiverse, etc. – the universe’s origin is not the effect of anything supernatural.¹¹⁵

But, does non-naturalist metaphysics – defined in opposition to the naturalist theory presented – necessarily equate with the “supernatural”? As a representative model aiding in human understanding, the activities of both metaphysics and science should be consonant with the most robust and current findings. In accord with the tradition of natural philosophy’s openness to metaphysical enquiry, a supernaturalist metaphysics pitted against “hard” science has not been proffered. Rather, the metaphysics we have postulated has moved from physical and natural scientific findings into metaphysical

¹¹³ *“If the results of our empirical methods are expected to be the results of real processes in a real world, we must exclude the possibility that the experimental setup can be causally influenced... without the interposition of motoric actions of... bodies”* (Mahner, 2012:1441).

¹¹⁴ Stenger, 2012.

¹¹⁵ Stenger, 2012.

speculation in exposing a foundation for the entities observed and hypothesised over by “hard” science.

To limit metaphysics to physicalism and to base that metaphysics within empirical measurements of unaccounted for science seems tantamount to the creation of another form of supernaturalism. Indeed, in this approach, the problem of being is crudely reduced to empiricism, that is, to a methodology wherein total and uncritical trust is placed. What is lost, however, are things whose being remains extant, but unexplained.¹¹⁶ The instrument of physics so conceptualised has become a self-determining master of naturalist knowing, whilst abandoning the being which it, by realist rights, should reflect (Psillos, 2009:36).

5.6. Conclusion:

Confronted by the influential research of scientific philosophers and “hard” scientists, the positing of a return to what had been deemed outmoded – the philosophy of nature – may seem close to self-destruction for any self-respecting current scholar. This chapter has, though, sought to reclaim philosophy of nature.

In putting forward strong argumentation that the findings of “hard” science do not adequately account for either the existence of science or of the being of the entities scientists seek to model in their theoretical constructs, science has been imaged as limited. My particular position has been consistent: in broadening the definition of science to the more etymologically ancient, Scholastic concept of “*scientia*”, systems of knowledge are able to be developed that transcend the limited nature of “hard” science reliant solely upon its own method. However, rather than a non-scientific metaphysics, this metaphysical mode seeks to be the grounding of the most robust of contemporary scientific findings, and thus is forced to stand in congruence with that science.

The practice of science – it has been argued – is founded in the rudimentary metaphysical assumptions that there is something that can be modelled by science and that science has the ability to develop representations of these things. Both of these positions lie

¹¹⁶ “It can... only be through the... sciences that a comprehensive knowledge of the world can be approached. But none of the special sciences aspires to a conspectus of the total field, for each special scientist is inevitably immersed in the interconnected details of his [sic] own branch... The need accordingly remains for the metaphysician’s effort to see things together... not to correct, outdo, or modify the pronouncements... [but] to form as complete and systematic a conception of the world as the available evidence permits” (Harris, [1965]1993:29).

unaccounted for within the scientific paradigm. Rather, as the naturalist position has indicated, it is assumed that science forms the foundation of what can be acceptable as real. However, this is counter to the philosophical postulates of among others, Plato, Aristotle, Copernicus, Kant, Descartes, and Leibniz, not to touch upon the Scholastics. In the works of each of these is an honest and robust attempt to account philosophically for the problem that things have being. In fact, despite the potent scepticism of Hume toward metaphysical thinking, mechanistic philosophy – a mighty force against the unobservable in the eras following the Scientific Revolution – did not manage to remove the problem of being, nor of its requiring a metaphysical foundation for even its own existence.

I have argued that the “problem of creation”, that is, the problem of how anything emerged as opposed to nothing remaining, should be approached as a problem of causality. In this reading of the Leibnizian problem, the core has been to develop an argument founded in hard science, whereby everything that is must be the result of an action preceding it. From the huge success of science, this methodology appears to have succeeded. The problem, however, of infinite regress swells up. Within a universe bounded by a space/time limit – such as this one – the causal regress must cease at $t=0$. At this moment, data of extant objects graspable by scientific methodology reaches its limit. We do not know what preceded $t=0$; for instance, it may have been a quantum vacuum as quantum cosmologists would hold. But, at some point, out of not-being (i.e. no substance), being emerges in everything extant within the universe, and continues to be sustained in existence through the approximately 12,8 billion year history of the cosmos.

The Thomistic metaphysical solution to the problem of existence past $t=0$ lies in Aquinas’ delineation between something being *made* from pre-existing matter and the causally necessary preceding event of that same substance being brought into being (*Contra Gentiles*, II, Ch. 17, §1). In Saint Thomas’ estimation, a change in matter extant is not creation.

“... [C]reation... is the emanation of all being... from... ‘not being’ which is ‘nothing’” (*Summa Theologica*, I, Q. 45, A. 1).

I propose that through the action of creation, being emerges as it cannot emerge by its own accord nor can it be brought into being by any other substance that is itself the product of a causally creative action. Moreover, I have argued that in each moment of the existence of a thing, that that thing has existence is the product of a causal act of sustaining being. I posit that through the combined approaches to creation of *creatio ex*

nihilo and of *creatio continua*, a metaphysical cosmology that enables the cosmological theories of “hard” science to meet the problem of the existence of all things is afforded. This is “*scientia*” in its truest sense.

While the metaphysical approach postulated may indeed change in the future as more data of the observable cosmos becomes available, the position that the being of all things is the result of a causal action of creation remains tenable. Though, as Aristotle indicated, the attempt at accounting for why anything is may be imprudent, tentative, but necessary.

“It may seem evidence of excessive folly or excessive zeal to try to provide an explanation of some things, or of everything... [This] criticism, however, is not always just... [for w]hen any one shall succeed in finding proofs of greater precision, gratitude will be due to him [sic] for the discovery, but at present we must be content with a probable solution” (Aristotle, *On the Heavens*, II, §5).

Notes:

ⁱ From this perspective, the “problem of creation” is removable in its totality because the quantum vacuum removes the problem. As there is no problem at all:

“... [O]ur real problem will not be to understand the beginning of the universe, or even to decide whether there really was a beginning...” (Weinberg, 1993:191).

In his Afterword to Krauss’ work that argues for the emergence of a universe from purely physical processes – *A Universe from Nothing* – the biologist Dawkins argues in a similarly dismissive vein as does Weinberg:

“The spontaneous genesis of something out of nothing happened in a big way at the beginning of space and time, in the singularity known as the Big Bang followed by the inflationary period... Even the last remaining trump card of the theologian, ‘Why is there something rather than nothing?’ shrivels up [in light of this argument]...” (Dawkins in Krauss, 2012:189, 191).

Krauss, too, puts forward:

“We can describe the evolution of the universe back to the earliest possible moments of the Big Bang without specific need for anything beyond known physical laws... [However, i]t certainly seems sensible to imagine that a priori, matter cannot spontaneously arise from empty space, so that something, in this sense, cannot arise from nothing. But when we allow for the dynamics of gravity and quantum mechanics, we find that this commonsense notion is no longer true” (2012:145, 151).

Despite the deeply philosophical components in their work, Hawking and Mlodinow conclude in agreement with Krauss and Dawkins by making appeal to physical processes as the fount of Being:

“... [T]he beginning of the universe was governed by the laws of science and doesn’t need to be set in motion by some god” (2010:135).

ⁱⁱ The conceptualisation of “philosophy of nature” we employ is defined in the Thomistic sense. Aquinas’ “natural philosophy” has its roots in that of Aristotle, particularly as enunciated by “the Philosopher” in his *Physics* (Wallace, 1982:11). Aristotelian “philosophy of nature” is the study of matter and the changes therein (Aristotle, *Physics*, Book II, Part 9). It is thus that Aquinas’ philosophy of nature follows suit, focusing upon the cosmos and the natural entities contained therein (Wallace, 1982:8). The importance that Aquinas gave to natural philosophy is expanded upon by Wallace:

“The fact that he turned from his *Summa theologiae* toward the end of his life to write commentaries on the *Physics*, the *De caelo*, the *De generatione et corruptione*, and the *Meteorology* indeed attests to the importance he attached to natural philosophy... [including] the special disciplines that treat of the phenomena of nature in all their specific detail” (1982:14).

One may readily ponder why it was so fundamental to Aquinas to consider natural philosophy?

This preoccupation emerged because Aquinas’ metaphysics was founded in his philosophy of nature (Wallace, 1982:10). In defining “metaphysics”, Aquinas delineates that “... the principles and causes of beings as beings” are the proper object of study (*Metaphysics*, Book VI, Lecture 1, §1145). Awareness of causes of being arises, for Aquinas, in experience of sensible entities that demand metaphysical accounts for their existence:

“... [C]ommon causes must be eternal, because the first causes of beings which are generated must not themselves be generated... this is especially of those causes which are altogether immobile and immaterial. For those immaterial and immobile causes are the causes of the sensible things evident to us, because they are beings in the highest degree, and therefore are the cause of other things... Hence there are **causes of beings as beings**, which are investigated in first philosophy...” (*Metaphysics*, Book VI, Lecture 1, §1164).

Within the *Summa*, Saint Thomas also articulates the fullness of knowledge which he describes as knowing completely about any particular thing, that is, both natural philosophical knowledge and metaphysical knowledge: the unity of which is held within the thing:

“The object of every cognitive habit includes two things: first, that which is known materially, and is the material object, so to speak, and, secondly, that whereby it is known, which is the formal aspect of the object” (II-II, Q. 1, A. 1).

In his attempt at bringing Thomism into dialogue with the contemporary “linguistic turn”, O’Callaghan – in similarity to Wallace – interprets Saint Thomas’ metaphysics as directed to from within his philosophy of nature, that is, out of details of particular beings:

“... [U]nless we understand something of beings in the world, however inchoate, we cannot speak of any beings” (2003:3, 12).

Thus, after possessing knowledge of particular beings and of being in general, the human natural orientation to know God, as cause of being, becomes a possibility, because to be dependent for existence is the nature of all created things (TeVelde, 2006:123, 126, White, 2009:3).

iii A philosophical grounding for science is given in the following excerpts from the philosophical period of Modernity:

“If we are to... search out the truth about everything that can be known... we must focus in an orderly way on the notions that we have within us, identifying the ones whose truth we vividly and clearly recognize when we focus intently on them... By doing this we’ll come to be in possession of some secure truths... Specifically... that we exist as thinking beings, ... that there is a God, ... that we depend on him, ... that by attending to God’s attributes we can investigate the truth about other things, because God is their cause. Finally, we’ll see that we have within us... knowledge of many eternally true propositions, e.g. ... that nothing comes from nothing... [and] that we have knowledge both of a corporeal or extended nature that is divisible, movable, etc. ... These few instructions seem to me to contain the most important principles of human knowledge” (Descartes, [1644]2012, I, §75).

“When God established the laws that are observed in Nature, I believe, he took into account principles of wisdom and reasons of order; which is why the consideration of final causes—i.e. of purpose or intent—not only advances virtue and piety in ethics and natural theology, but also helps us to find and lay bare hidden truths in physics itself” (Leibniz, [1698]2006a, §4).

“So a rational doctrine of Nature deserves the label ‘natural science’ only when the laws of Nature that underlie it are (1) known a priori and aren’t mere (2) laws of experience. Knowledge of Nature of kind (1) is called pure rational knowledge; knowledge of kind (2) is called applied rational knowledge. Since the word ‘Nature’ already carries with it the concept of laws, and since that carries with it the concept of necessity, it’s easy to see why something can count as natural science only because of the pure part of it, i.e. the part containing the a priori principles of all the other explanations of Nature” (Kant, [1786]2009).

iv Enunciating the relationship between philosophy and science, Jackson underscores their connection within the real world:

“Metaphysicians seek a comprehensive account of... most ambitiously everything. In doing this they are following the good example of physicists” (1994:25).

Whether or not physics precedes philosophy, or philosophy, physics, remains to be seen. That is not our focus, although it is a debatable point. What does herald both attempts at modelling real entities in a systematic fashion are the entities themselves.

v Considering Newton’s status among classical physicists, Heller notes:

“... Newton deserves to be regarded as the real father of mechanism. It is from him that we get that branch of classical physics that is called mechanics, and the frankly unprecedented successes of that branch... imposed on many

generations of physicists and ordinary people the conviction that the world is a great mechanism” (2011b:130-131).

Newtonian mechanism had its footing in Newton’s “Laws of Motion”, which as articulated in the *Principia* are:

- First Law: “Every body perseveres in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed thereon” ([1687]1846:83).
- Second Law: “The alteration of motion is ever proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed” ([1687]1846:83).
- Third Law: “To every action there is always opposed an equal reaction: or the mutual actions of two bodies upon each other are always equal, and directed to contrary parts” ([1687]1846:83).

These nigh impregnable laws strongly influenced the materialisation of the Western mechanistic worldview in early Modernity, and continue to have central place in contemporary physics.

^{vi} According to Newton, “absolute, true and mathematical time, of itself, and from its own nature flows equably without regard to anything external...” ([1687]1846:77). Absolute time is contrasted with relative time, that refers to the commonly understood sense of time as measured in hours, minutes, etc. ([1687]1846:77). In a similarly objective way, “absolute space” is also unaffected by objects, remaining immovable ([1687]1846:77). Like absolute time, absolute space is not observable ([1687]1846:77). Because these absolutes cannot be sensorily experienced, in order to understand, the human is compelled to attempt to employ measurement as best as possible ([1687]1846:79).

“... [S]o, instead of absolute places and motions, we use relative ones... but in philosophical disquisitions, we ought to abstract from our senses, and consider things themselves, distinct from what are only sensible measure of them” ([1687]1846:79).

In a Kantian sense, Newton founds his scientific theories in a separation between the objective as construed by philosophy and the appearance accessible to the scientist-subject.

^{vii} Tryon was the first to propose that the universe emerged out of a Quantum Vacuum:

“I assume the Universe to be undergoing its initial expansion, evidently having appeared as a fluctuation of the [quantum] vacuum” (1973:397).

But, the lack of empirical evidence (given the wanting of the Planck Era) has resulted in criticism of Quantum Cosmological models (cf. for example, Coule, 2000:6-13).

^{viii} As an endeavour limited by available evidence, as well as the capabilities of its practitioners and their instruments, science can only make the best of what it has available. Despite the limits placed upon what can be known about the earliest moments of the cosmos, significant advances have been made in attempting to understand the beginnings of the universe (Stoeger, 2010a:173).

Amidst these are the theories posited by string cosmologists, like Veneziano, who proposed that there were cosmological events prior to the “beginning of time”, for $t=0$ (in accord with the standard cosmological model [i.e. the Friedman-Lemaître-Robertson-Walker (FLRW)]) is “fictitious” (Gasperini & Veneziano, 2003:6). However, as Veneziano – a CERN theoretical physicist and initiator of String Theory – acknowledges, the postulations of string cosmology are “hazarded guesses” (Veneziano, 2004). The various string cosmologies include the “pre-Big Bang Scenario” (developed by Veneziano, proposing that the initial singularity is the deceleration following an accelerating cosmic incident) and the “Ekpyrotic Scenario” (of Khoury, Steinhardt, Ovrut, Seiberg and Turok who theorised that the universe was a single zero dimensional point [brane] among many, where the Big Bang was the after-effect of a collision between two such branes) (2004).

With regard to Veneziano’s model, the accelerating universe provides observational counterevidence. It is the lack of observational information available to support such models, too, which Linde holds against them (2006).

^{ix}An example from the first period is Saint Thomas Aquinas, who in the *Summa Theologica* proposes:

“In the world of sense we find there is an order of efficient causes. There is no case known (neither is it, indeed, possible) in which a thing is found to be the efficient cause of itself; for so it would be prior to itself, which is impossible... [T]o take away the cause is to take away the effect... Therefore it is necessary

to admit a first... cause, to which everyone gives the name of God” (I, Q. 2, A. 3).

Whilst, Descartes – representative of early Modernity – argued:

“... [W]ithin us [we have] an idea of God... We find in the idea... such immeasurable greatness that we’re convinced that it must have been placed in us by something that truly possesses the sum of all perfections, i.e. by a God who really exists. That’s because the natural light makes it very obvious... that nothing comes from nothing, but also that a thing can’t have as its sole cause something that is less perfect than it is... there has to be somewhere an original that actually has all the perfections belonging representatively to the idea. And in the case of our idea of God the ‘somewhere’ can’t be inside us, because we plainly don’t have the supreme perfections that our idea of God represents; so we’re entitled to conclude that what does have them is something distinct from ourselves, namely God” ([1644]2012, I, §18).

x Russell’s position on causality is expressed in the example he provides from science:

“In constructing the ‘Nautical Almanac’ for 1915 it will assume that the law of gravitation will remain true up to the end of that year; but it will make no assumption as to 1916...” ([1913]1992:203).

In Russell’s example his point of the tentative nature of science is made clear, but one would have to be cautious to read that Russell was denying that the law of gravity would be altered within the period of a year. Rather, the example serves to demonstrate the restraint Russell discerns in the theoretical postulations of scientists. The claim, as Hume pointed out (cf. [1748]2008:14), is not to have “discovered” ultimate cause but rather tentatively postulated relationships between entities at the particular moment considered (Russell, [1913]1992:198).

xi The Hartle-Hawking model arose from James Hartle and Stephen Hawking’s endeavour to relate quantum physics to the whole universe (1983:2960). In their 1983 paper entitled “*Wave Function of the Universe*”, they essentially develop a proof to demonstrate that their quantum model is more favourable than the classical model. Their reasoning is that while the classical cosmological model is reliant on an initial singularity, which implies a boundary for the universe (i.e. where space and time = 0), their model has neither a singularity, nor do the field equations break down as they do in the classical model as a result of the singularity (1983:2974). Thus, it is contended that there are no boundary conditions for the universe, and thus, that it is reasonable to assume that the universe has existed forever (Hartle & Hawking, 1983:2975, Hawking, 1985:12).

However, the gap in the Hawking-Hartle model of a universe with no bounds is that the model does not, as they confess, mirror the actual universe within which we find ourselves:

“The ground-state wave function in the... model that we have considered... does not correspond to the quantum state of the Universe that we live in because the matter wave function does not oscillate” (Hartle & Hawking, 1983:2975).

Without this correspondence, the weight of the “no boundary” model is substantially weakened for it is not reflective of the way things are in the universe.

xii Comparison of multiple English translations of the Bible reveal the loss of both the Hebrew and Latin emphases upon nothingness, for instance:

- *“In the beginning God created the heavens and the earth. Now the earth was a formless void...” (The Jerusalem Bible, Genesis 1:1-2).*
- *“In the beginning when God created the heavens and the earth, the earth was a formless void...” (New Revised Standard Version, Genesis 1:1-2).*
- *“When God began creating the heavens and the earth, the earth was at first a shapeless, chaotic mass...” (The Catholic Living Bible, Genesis 1:1-2).*

Within each of these the existence of the earth is imaged as a pre-existing void without form, as opposed to not existing at all. In other words, the language usage – employing the verb “was”, the past indicative of “to be” – would indicate something similar to what Saint Augustine mentions in the *Confessions*, that the earth was “... something that had the possibility of being formed... [that is] unformed matter” (XII, VIII(8), [397-398]1955:212).

^{xiii} Of interest in this regard, however, and in support of Aquinas' interpretation of Aristotle on creation having occurred – here, in the theological sense, as will be explored below – is Aristotle's position on the non-existence of "*actual infinity*" (Baldner & Carroll, 1997:11, 24). In his *Physics* and *Metaphysics*, Aristotle argued:

"For generally the infinite has this mode of existence: one thing is always being taken after another, and each thing that is taken is always finite..." (*Physics*, Book 3, Ch. 6, Part 6).

"For the fact that the process of dividing never comes to an end ensures that this activity exists potentially, but not that the infinite exists separately" (*Metaphysics*, Book IX, Part 6).

^{xiv} Thomistically, the most inclusive definition of "creation" was that it is an act of dependence for being as held by anything which has being (Baldner & Carroll, 1997:4).

"... [Creation is t]o produce a thing into being according to its entire substance" (Aquinas, *Writings on the Sentences*, II, distinction 1, Q. 1, A. 2 in Baldner & Carroll, 1997:74).

The positing of an eternal theory of creation, as Aquinas did, was possible because he conceptualised two definitions of "creation": the one being philosophical (which did not make any reference to creation in time) and the other theological (which held that the cosmos has temporal finitude) (1997:26).

"... [N]ot only does faith hold that there is creation but reason also demonstrates it" (Aquinas, *Writings on the Sentences*, II, distinction 1, Q. 1, A. 2 in Baldner & Carroll, 1997:75).

In the demonstrable, philosophical sense, Aquinas proposed that there was a rational possibility that the cosmos could be both created (that is, dependent upon God for existence) and eternal; this is the philosophical definition of creation (1997:26). His argument here hinges on his contention that creation logically does not occur from anything that substantially pre-exists the created as prior to the thing created that comes to hold being the thing was not-being (Aquinas, *Writings on the Sentences*, II, distinction 1, Q. 1, A. 1 in Baldner & Carroll, 1997:75).

However, the theological proposition is that the universe had a beginning point in time, so making it non-eternal (1997:26). This clarification was considered "theological" by Aquinas because it could not be known demonstrably, but only through propositional faith (Aquinas, *Writings on the Sentences*, II, distinction 1, Q. 1, A. 1 in Baldner & Carroll, 1997:75).

"... [N]ot only does faith hold that there is creation but reason also demonstrates it" (Aquinas, *Writings on the Sentences*, II, distinction 1, Q. 1, A. 2 in Baldner & Carroll, 1997:75).

^{xv} Amidst the most famous proponents that the initial singularity was the beginning, which thus might confirmed the existence of God, was Pope Pius XII, who declared:

"[I wish... to give a few quick examples... [from the] modern sciences that demonstrate the existence of God... [Even t]o the simplest of believers this is an account that is not that different from the first words of Genesis, 'In the beginning'..."

"... [I]t is worthy of attention that modern scientists estimate the idea of the creation of the universe as entirely reconcilable with their scientific conception ... Sir Edmund Whittaker [for example]... when he speaks of his research around the age of the world [proposes that]... before the cosmos, if it existed, existed in a form totally unlike anything known to us: so that it represents the ultimate limit of science. We may perhaps without impropriety refer to it as the Creation. It provides a concordant background to the view of the world, which is suggested by geological evidence, that every organism existing on earth had a beginning in time..."

What then is the importance of modern science as regards the argument for proof of the existence of God[?]... From the concreteness of physical proofs the contingency of the universe, it can be deduced that time and the cosmos are out of the hand of the Creator.

The creation in time [is apparent], then, and therefore, a Creator, then God!”
(1951. [Text translated by the author from the Italian]).

As is well known, Lemaître subsequently met the then Pope criticising him for this stance, after which Pius never again referred to the initial singularity as the moment of creation (Farrell, 2010:197).

A similar line to Pope Pius has been taken by some evangelical Christians:

“The standard Big Bang model thus describes a universe which is not eternal in the past but which came into being a finite time ago. Moreover, – and this deserves underscoring – the origin it posits is an absolute origin ex nihilo. For not only all matter and energy, but space and time themselves come into being at the initial cosmological singularity” (Craig, 1999:725).

Of course, the negation of this point arises from Quantum Cosmologists, in their hypothesising that the initial singularity was not the beginning of the universe, but only a part of historical cosmogenesis (Stoeger, 2010b:172). As physical cosmology is limited in its knowledge prior to the emergence of CMB, I would take a similarly tentative line, whereby no absolute declaration can be made about the initial singularity being the moment of absolute origin.

^{xvi} In the physicalist conjecture that “hard” science is the foundation of metaphysical activity, metaphysics requires a foundation outside of itself, fair enough. However, this hypothesis is not without its own problems. It can be countered that if scientific theory as representational knowledge grounds metaphysics, there is the requirement for scientific theory itself to be founded. One may suppose that as a symbolic construct of an entity forming part of the “world”, science too is a system of knowledge founded beyond itself (in the human experience of the “world”). Science would then be unjustifiable without reference to the symbol towards which as a sign it directs.

“... [S]cience explains and metaphysics... anticipates the general structure of proportionate being as explained” (Lonergan, [1957]1970:524).

CHAPTER 6:

The unity of Truth: causal knowledge of contingent being

“... [T]he question ‘Why is there anything at all?’ is quintessentially mystical... [in] that it apparently has no possibility of an answer. Whatever answer it would have to be something in the world, or else something other than the world, and the question would just reappear over the existence of that other thing” (Smart, 1996:35-36).

6.1. Introduction:

The preceding chapter gave attention to the “problem of creation”, because among the philosopher’s tasks is conjecturing reasoned responses to this enigmatic reality at the core of every being (Aristotle, *On the Heavens*, II, §5). Attempts at solving the problem, though, result in the emergence of a dilemma as articulated by Smart: it makes little sense for the cosmos to be without cause, but if a cause extra to the material cosmos is invoked, the perennial problem of the causality of the causer remains. Given the argument that the cosmos cannot be self-causing – in that creation cannot be brought about by the created – the latter component of Smart’s critique remains to be faced in this chapter.

It has been postulated that physical and natural science do not account for the emergence of being in the act of creation. Indeed, creation – the bringing about of being from not-being – is radically different to any change that material entities can bring about. Hence, the problem of explicating why something exists rather than nothing at all demands a thorough metaphysical consideration.

This being the case, can a metaphysical cause be solicited to nonconflictually cooperate with the findings of “hard” science about the contingent way that physical and natural reality are? Could the Thomist theoretical framework of “*scientia*” be maintained, such that – in the tradition of natural philosophy – there is congruence between physical and metaphysical science? Smart’s problematic, though, holds firm in the face of any such articulation:

“... [C]ausal arguments... maintain that the natural order, or something encountered as, or inferred to be part of it, could not exist save for the existence and efficacy of something else that is not itself part of that order...” (Haldane, 1996:95).

It is a broad assertion that there is a “problem of creation”. This scope makes the development of a sufficiently content-full argument – within which a clear articulation of cause is demonstrated – a challenge. The situation is exacerbated by the reality that the causal act of creation is absolutely divergent from any other that can occur within the space-time continuum. Different to other causal acts, creation – the bringing about of existence – leads to absolute dependence of all physical things upon the cause. Without the causal action of the creating agent no thing would be, hence, necessitating both the dependence and the cause.

The task of this chapter is two-fold: firstly, to ascertain what is responsible for the act of creation upon which all things that hold contingent being depend. As the first brief of this chapter will result in the defence of a theistic treatise, the second will be to consider the strength of this position.¹

However, to establish the Theistic argument, the link between metaphysics (in the “problem of creation”) and faith (the source of belief in God) must be established. In so doing, the Theistic postulation will become permissible. As this entire research work is dedicated to a Thomistic response to the presenting problem, primary texts of Saint Thomas Aquinas will once more be utilised. In particular, Aquinas’ position that creation is an act that belongs solely to God will be argued for (*Summa Theologica*, II, Q. 21, §1).

Keeping with the philosophical character of this work, counter-arguments to Thomist natural philosophy will be presented; in these, it is proposed that one cannot proceed from the created to the postulation of the existence of a transcendent creator. Contrary accounts will then be given to strengthen the core argument of this research.

The chapter concludes with a discussion of the unity of knowledge as presented in the Thomistic account of “*scientia*”. In Aquinas postulating that God is the cause of creation in every contingent entity there is an encounter between the temporal and the sublime: subject encounters thing as being, and being presents itself as-it-is to the thinking subject. Only through an epistemology that considers the multiple dimensions of being – as both

¹ It will be argued that the Theistic account provides the best available approximation of a response to the “problem of creation”. This claim must be investigated by the critical exploration of the answer conjectured.

ontological to the thing-itself and epistemological to the perceiver of the thing – can an adequate representation of being be construed.

6.2. Metaphysics and faith:

The appeal to a Divine Creator is a widely proposed solution to the “problem of creation”. In light of natural and physical sciences’ inability to solve the problem, in conjunction with the metaphysical nature of the problem, the philosopher cannot simply negate the possibility that there is a primary cause extra to material reality. The perpetual encounter with being places the problem at the core of the subject’s existential experience.² However, it is complex and difficult to ascertain why anything is. Indeed, to consider the proposal that “God creates”, a causal relationship between philosophy and faith must be established, because the faith-contents of the theological assertion – at a minimum – hold that:

“... [T]here is a being on my relationship to whom depends everything that I do or might value [i.e. ‘God’]... We finite beings would not exist if God had not created us. We would not continue to exist if he did not sustain us” (MacIntyre, 2009:8).

Chronologically, belief in divine entities predates the emergence of formal philosophy (MacIntyre, 2009:13).³ In a more general and mundane sense, though, the act of faith – having belief – is part of the daily reality of self-reflectively conscious humans. To know, for instance, that one is hungry, one must hold in belief that the “I” exists in order to know that the “I” is hungry, prior to the possibility of rigorous philosophical proofs thereof at more complex levels of functioning. In its most rudimentary form,

“... [b]elief... is a term that is inclusive of all sorts of mental attitudes, all the way from the most uncritical and naïve to utter disbelief...”
(Blanchette, 2007:141).

² *“Before knowing that Peter is a man, I have already attained him as something, as a being. And this intelligible object ‘being’ is not the privilege of one of the classes of things that the Logician calls species, genus, or category. It is universally communicable. I find it everywhere, everywhere itself and everywhere varied. I cannot think anything without positing it before my mind. It imbues everything. It is what the scholastics called a transcendental object of thought” (Maritain, [1959]1995:224).*

³ While the earliest held systematic philosopher Thales of Miletus, can be dated to the 6th century BC, and the written works of Plato and Aristotle emerge from the 4th century BC, evidence for belief in transcendent entities dates to at least fourteen centuries before Christ (Armstrong, [1993]1999:4). Later indication of varieties of theism comes from four millennia BC when the Tigris/Euphrates area of Asia Minor was first populated ([1993]1999:6).

As a part of the daily operation of the human, belief is not irrational: instead, it is a reasonable tool used to comprehend the individual's place within the cosmos for survival (2007:141-142). The necessary understanding that one is hungry – for example – does not of necessity imply understanding of anything beyond rudimentary sensation, however, for such belief is of a *simplex*, operational variety. But, the human cannot remain within the mundane and immanent, for we have “... a *need for transcendence*”, to better understand the experiential (Marcel, [1950]2001:39).

Epistemologically, this need emerges out of the thinking subject's constant facing of being. In perceiving something's existence, then the being of the thing is acknowledged to the thinking subject (MacIntyre, 2009:74). Once identified, being can be explored further. If causality is essential to being, then it can be inferred that “... *I can only understand a substance as a possibility made actual by existence having been conferred upon [it]...*” (2009:74). This form of systematic questioning is the beginning point of philosophy, that is, the reasoning over experiences of the thinker (2009:74).

Science's inability to resolve the “problem of creation” clearly demarcates it as a non-scientific problem. In point of fact, physical and natural science do not aid in the grasping of any agent that could have brought any other thing into being (2009:77). Rather, from the perspective of “hard” science, being simply is, and no further explanation is possible from it or necessary to it (2009:77).^{4 5} To whence should the philosopher turn for further understanding? If the problem transcends the knowability of physical and natural science because it absolutely transcends the causality apparent within the space-time continuum, it is to metaphysics alone that succour can be sought from. After all, in the attempt of the immanent, thinking subject to explain the milieu within which she finds herself, a boundary is met in solely immanent-type theories. But, this pursuance of transcendent constructs is neither irrational nor non-empirical.

“... [T]he *judging of something to be outside experience is itself empirical, that is to say it is a judgment made from within experience [about what is non-experientable]*” (Marcel, [1950]2001:46).

⁴ “As far as empirical science goes, existence is just a matter of fact” (Lonergan, [1957]1970:654).

⁵ “No matter how far scientific explanation is taken, the existence of whatever it is that exists and its having the characteristics that it has remain *surd facts, yet to be made intelligible*” (MacIntyre, 2009:77).

While the human can more readily experience the immanent, transcendence is not non-experiencable ([1950]2001:46). Rather, by definition it is delineated in terms of what it is not, which does not imply that no experience thereof can be had ([1950]2001:46).⁶ The arguments earlier explored concerning a self-causing cosmos without appeal to a metaphysical creative agent are built upon empiricist positivism resulting in unsatisfactory accounts of the primordial metaphysical problem. This is partially meritable to an explicitly limited grasp of what is experience ([1950]2001:47). By curbing experience to the sensorily perceptible, any possible theoretical construction is bounded to sensory empiricism ([1950]2001:47). The direct implication is that all empirical studies and their ontological contents are reduced to one-dimensional physicalism ([1950]2001:47). Nevertheless, trying to access transcendent knowledge does not mean abandoning experience since embodied beings are reliant upon the senses to explore their milieu ([1950]2001:47).

On the contrary, experience must be re-imaged in terms of the multifaceted nature of being. This implies an awareness of the transcendent “*otherness*” apparent from experience of causal immanence and of what is behind the immanent ([1950]2001:48). More specifically it denotes a thorough turning towards metaphysics, which has “being” as its proper object of study (Maritain, [1959]1995:231).⁷

Metaphysically, immanent experience begins with what is known primarily and most universally, that is, being ([1959]1995:224). Every experience of a particular so directs beyond the immanent thing towards the more universal reality that that thing has existence ([1959]1995:226).⁸

“... [In the experience of] *the individual more than the individual itself...* [is given. For the thinking subject] *attains a universal object of concept communicable to all the individuals of the same species or of the same genus*” ([1959]1995:226).⁹

⁶ “Not only does the word ‘transcendent’ not mean ‘transcending experience’, but on the contrary there must exist a possibility of having an experience of the transcendent as such, and unless that possibility exists the word can have no meaning” (Marcel, [1950]2001:46).

⁷ “The object of metaphysics... is an entirely other world, the world of the superuniversal, the world of transcendental objects which... offer a field of intelligibility which has in itself its own ultimate determinations” (Maritain, [1959]1995:231).

⁸ “... [A]mong all effects the most universal is being itself...” (Aquinas, *Summa Theologica*, I, Q. 45, A. 5).

⁹ “When I look at a man and think: ‘This is a being’, or ‘He exists,’ I grasp a certain determinate being, finite, perishable, fleshly... subject to time... and a certain existence similarly qualified. But the

The metaphysical dimension of the philosophical enterprise emerges as the sole port of entry for a discourse that relates to knowledge of the transcendent of particularities (Blanchette, 2007:145). From consideration of the experiential, the Natural Philosopher – by posing questions that relate to the apparent but transcend it – is pushed through the metaphysical approach to its limit that accommodates the fully transcendent (2007:145).

Encountering transcendent being, being is experienced without the “contamination” of later cognitive input (Maritain, [1959]1995:228). This is because being pushes itself upon the sensating, thinking subject prior to the mind having occasion to construe anything thereupon ([1959]1995:228-229). It is apparent as it is, in-itself. As first met, then, prior to cognition occurring, being cannot be misconstrued by the thinking subject ([1959]1995:228).

In the movement beyond the limits of temporality, the philosopher can postulate the existence of a necessary causal agent, un-bound by space or time; a “... *transcendent ground of being*” (Blanchette, 2007:146). This postulated metaphysical agency is analogous to the faith-proposition that “God created”, as the God-creator is a fully transcendent reality. Indeed, as metaphysics directs to a transcendent cause, so too, transcendence is an essential part of religious belief (Blanchette, 2007:145).¹⁰

Together, belief and metaphysics form a symbiotic relationship. As metaphysics requires a response to the “problem of creation” not limited by the boundaries of science, so belief requires realistic, reasonable propositions.

The reminder should be given that without appeal to a transcendent cause – with or without absolute identification – there is no argument that accounts for the existence of existence, indeed, for the act of bringing forth existence from non-existence. Thus, all things that exist within space and time would remain unexplained.¹¹ There is, therefore, room within a reasoned metaphysics for the possibility of the contents of belief to be tenable.

analogous object ‘being,’ ‘existence,’ *thus thought by me outreaches this analogate*” (Maritain, [1959:1995:226).

¹⁰ “... [T]ranscendence is presupposed in properly religious belief” (Blanchette, 2007:145).

¹¹ Physicalist appeals to a self-causing universe, as demonstrated, leave the universe existing without expanding upon how extant material processes came to have existence and themselves later acted upon matter to effect further developments within time and space.

Can a transcendent belief-position serve as a reasonable way of obtaining knowledge? The presumptive bias that all articles of faith are equivalent to conjecture is apparent in this question (Marcel, [1951]2001:68). Nevertheless, by their nature articles of faith transcend empirical knowledge:

“... [Faith] goes beyond what has strictly been given to me [by immanent sensation], it is a jump [into the transcendent] ...” ([1951]2001:79).

In the leap to transcendent knowledge, faith seeks to respond to the problems – such as the primordial metaphysical question – that “hard” science cannot. Utilising reason in this pursuit does not imply that faith is a matter of supposition. On the contrary, faith draws out the boundaries of physical and natural science elucidated in earlier chapters of this work. In so doing, the faith position does not construct an account that fills the space of the currently scientifically unknown. Rather, it attempts to ground empirical science within being, for without being there can be no knowing or observing.

6.3. Divinely attributed causality: where God and creation meet:

If metaphysics leads to transcendent knowledge and an overlap with the faith-position of a transcendent creator, theories that postulate the existence of a “divine” creator should be explored without prejudice. Moreover, in continuation with the argument of the earlier Thomist discussion, this probe should be from the position that faith does not imply irrationality. Nevertheless, in the study of the transcendent, the thinking subject must confess her limitation in articulating and explicating transcendent knowledge (Burrell, 2010:49).

6.3.1. *The historical development of theories of metaphysical causality:*

Utilising the historical reconstructivist method employed throughout this thesis the roots of metaphysical causality within the Western philosophical tradition will be considered. A proponent of that tradition is Aquinas – the focus of this work – who as a Scholastic philosopher-theologian was imbibed in the Judaeo-Christian worldview. Judaeo-Christianity did not exist in ideological isolation through its development, though. Ancient Greek thinking – among others – had an impact thereupon. In terms of the “problem of creation”, both Plato and the Stoics contributed to the later elaboration of Judaeo-Christian metaphysical causality (McMullin, 2010:16-17).

Plato postulated that a transcendent divinity – the “*Demiurge*” – was responsible for the production out of matter of all that exists (2010:17). The “*Demiurge*” changed matter to form-like substance in this production in accord with the archetypal Forms resident in the realm of the “*Eidos*”.

“... [All stars] were generated... which turn themselves about as they travel through Heaven, to the end that this Universe might be as similar as possible to the perfect and intelligible Living Creature in respect of its imitation of the Eternal Nature thereof.

*“Now in all other respects this world had already... been wrought in the similitude of that whereunto it was being likened, but inasmuch as it did not as yet contain generated within it the whole range of living creatures, therein was it dissimilar. So this part of the work which was still undone He completed by moulding it after the Model... [T]he Absolute Living Creature [decided that] such and so many [forms] as exist... this world also should possess” (Plato, *Timaeus*, 39d-39e).*

The “*Demiurge*”, however, was not the “*Creator*”, as the matter out of which the solitary transcendental cause brought about forms existed prior to its activity.¹² This is the fundamental difference between Platonic cosmology and the later Judaeo-Christian belief in “*creatio ex nihilo*”. In the latter, matter did not pre-exist the One responsible for being. Nevertheless, early Christians resonated with Platonism through their own faith-system, for the “*Demiurge*” was “... *single..., supreme and all-shaping*” as was their analogous description of their God (McMullin, 2010:17).

The second Greek philosophical tradition that impacted upon the development of Judaeo-Christian cosmology was Stoicism, which became influential within the Roman Empire in the first two centuries AD (2010:17).¹³ Stoic cosmology did not posit a transcendent cause of being, but rather a cause who immanently and reasonably cast matter (2010:17).¹⁴ Of Stoic cosmology – the great historian of early Western philosophy – Diogenes, explained:

¹² “... [T]he *Demi-urge*, is not omnipotent and is not creating the world out of nothing, but is merely shaping and ordering matter that is already in existence” (Kretzmann, 1991:214).

¹³ Stoicism emerged in the third century BC in Zeno of Citium and declined only in the third century AD.

¹⁴ “... [T]he *Stoic God* is immanent throughout the whole of creation and directs its direction down to the smallest detail” (Baltzly, 2014).

“God is one and the same with Reason... In the beginning he was by himself; he transformed the whole of substance through air into water, and just as in animal generation the seed has a moist vehicle, so in cosmic moisture God, who is the seminal reason of the universe, remains behind in the moisture as such an agent, adapting matter to himself with a view to the next stage of creation” (Book VII, Ch. 1, §136).

Despite the immanence of the Stoic “God”, early Christians could identify with the monotheism of the Stoic narrative (McMullin, 2010:17). Christian monotheism’s historic origin rests, obviously, within Judaic monotheism. However, the emergence of the latter was not a hurried process that occurred soon after the Abrahamic migration from Ur of the Chaldeans to Canaan around 2000 BC (Shea, 2000:248). Instead, there was a slow progression toward monotheism.

Approximately twelve centuries after Abraham, Proto-Isaiah experienced a mystical revelation of the God who Is (Armstrong, [1993]1999:52). In this encounter, the Hebrew God, YHWH, showed His identity as more than the God only of the people of Abraham ([1993]1999:53). He insisted upon no longer being recognised as a god among gods, but as *the* God of the whole Earth ([1993]1999:53). From a particular god, then, YHWH came to be understood as *the* Universal God ([1993]1999:56). The Deuteronomical “*Shema*” clearly reveals YHWH’s primacy above other gods:

“Hear, O Israel! The LORD is our God, the LORD alone! Therefore, you shall love the LORD, your God, with all your heart, and with all your soul, and with all your strength” (Deuteronomy 6:4-5, New American Bible: Revised Edition).

Careful reading of the “*Shema*” demonstrates, however, that the Hebrew people were not yet completely monotheistic. In declaring that “*The LORD is our God...*”, conceptual space remains for other gods’ existence (Armstrong, [1993]1999:67). Were the Hebrews already monotheists the text should have professed: “*The LORD is God*”. Seemingly the awareness of other gods was a product of the various exiles suffered by the Hebrew people – in both Egypt and Babylon – where they were exposed to the faith traditions of their captors. In direct counter-position to the gods encountered during the Babylonian exile, Deutero-Isaiah fully embraced monotheism by rejecting all other gods (Armstrong, [1993]1999:75).

“Before me, no god was formed, and after me, there shall be none. It is I, I the LORD... I am God, yes, from eternity I am He... I am the LORD, your Holy One, the creator...” (Isaiah 43:10-12, 15, New American Bible: Revised Edition).

In addition to identifying YHWH as the *only* God, Deutero-Isaiah professed YHWH as the *creator* of all that is.¹⁵ Such a profession of faith was opposed to the creation narratives of Babylon and other Ancient Near Eastern gods who were considered as creators by their followers.¹⁶

Absolutely dating the period of the emergence of the Hebrew creation narratives is not easy. However, it has been conjectured that the Genesis creation stories – as part of the Pentateuch – are datable to after the writing of the Book of Isaiah, i.e. to the post-exilic period of the fifth century BC (Ska, 2006:217).¹⁷ In accord with these dates and following on from the monotheism established by Isaiah, the Book of Genesis presents a God-creator who is the sole, absolutely transcendent, divinity.¹⁸

“... [M]y thoughts are not your thoughts, nor are your ways my ways, says the LORD. As high as the heavens are above the earth, so high are my ways above your ways and my thoughts above your thoughts” (Isaiah 55:8-9, New American Bible: Revised Edition).

6.3.2. **Only God creates:**

The act of creation, it has been argued, precedes all that is extant within time and space.¹⁹ Moreover, it permeates every moment of existence; for in being, that a thing is, draws to attention the “problem of creation” (Aquinas, *Contra Gentiles*, II, Ch. 21, §4). No other created being, we put forth, can bring forth being from not-being, i.e. to create. Hence, the line of argument we are compelled to take is that of a cause of being transcendent of the created, as the created cannot create itself or anything else (*Contra Gentiles*, I, Ch. 49, §4).

¹⁵ “Yahweh alone was responsible for calling all things into being” (Armstrong, [1993]1999:79).

¹⁶ Armstrong makes the inference that the identification of YHWH as sole creator by Deutero-Isaiah may have been the consequent reaction of the Hebrew people encountering other gods like Baal and Marduk whilst in exile in Babylon ([1993]1999:76).

¹⁷ Earlier discussion – in the fourth chapter – of the influence of the Babylonian creation narrative, *Enuma Elish*, and the construction of the Genesis creation narratives would also support the dating of the Book of Genesis to during or after the period of the Babylonian exile.

¹⁸ Genesis 1 – 2 (New American Bible: Revised Edition).

¹⁹ “... [T]he act of being... is caused by creation, which presupposes nothing; because nothing can pre-exist that is outside being as such” (Aquinas, *Contra Gentiles*, II, Ch.21, §4).

Utilising reason and observation, Aquinas trod the well-worn path of Natural Theology in the first book of the *Contra Gentiles* (Kretzmann, [1999]2001:33). From the existence of things, he posited the existence and nature of God ([1999]2001:33).ⁱ Aquinas noted, for instance, that:

“... [N]ot even God can be called Creator... save of... things that are”
(*Contra Gentiles*, I, Ch. 79, §2),

And again:

“... [I]t befits God according to His nature to be the cause of other things... Since... God knows Himself to be a cause... This cannot be unless He somehow knows what He causes. This is other than He, since nothing is the cause of itself” (*Contra Gentiles*, I, Ch. 49, §2, 4).

By building upon the foundations established in Book I of the *Contra Gentiles*, Aquinas presumes the possibility of a rational account of the Being known as “God” (Kretzmann, [1999]2001:33). However, before this can be given, a correlation between “God” and the act of God as creator must be established ([1999]2001:33). Aquinas does this in the first book by appealing to the Aristotelian interpretation of efficient causality:

“In Metaphysics II [Ia, 2] Aristotle... show[s] that there is no infinite regress in efficient causes and that we must reach one first cause—God. This way is as follows. In all ordered efficient causes, the first is the cause of the intermediate cause, whether one or many, and this is the cause of the last cause. But, when you suppress a cause, you suppress its effect. Therefore, if you suppress the first cause, the intermediate cause cannot be a cause. Now if there were an infinite regress among efficient causes, no cause would be first. Therefore, all the other causes, which are intermediate, will be suppressed. But this is manifestly false. We must, therefore, posit that there exists a first efficient cause. This is God” (*Contra Gentiles*, I, Ch. 13, §33).

Existing within space and time, the sequence of efficient causality would cease were any particular cause in the chain of causality removed. Thus, Aquinas argues there must be an initial efficient cause that brings about being. Without this efficient cause no other thing could be. The first primary efficient cause is identified as “God” for Aquinas, who though not of matter, brings about being from not-being. It is only possible for God to do this because God is not created.

Thus, in the Thomistic conception, the “problem of creation” leads directly to the Judaeo-Christian metaphysical-faith position that the only being that can create – as opposed to

changing what has existence already – is God who is being, transcendent of created time and space, upon whom all creatures are dependent for their existence (*Contra Gentiles*, II, Ch. 21, §1).²⁰ How can we be sure that God is the creator? Aquinas vaguely declares:

“... [C]reation is an action proper to God, and... He alone can create”
(*Contra Gentiles*, II, Ch. 21, §1).²¹

This does not particularly aid the argument at first glance. But, the reader may recall, creation does not mean the change of matter – for the Thomist – but the emergence of matter from nothingness. Because of the given definition of “creation”, Aquinas considered creation as the primordial action that brought about the being of space, time, matter, and all things with being. There can hence be no action prior to creation for before creation there was no-thing in existence, thus, it is solely dependent upon the act of creation that all beings have their existence (*Contra Gentiles*, II, Ch. 21, §3).

Would it be reasonable to assert that creation just occurred without a cause responsible for the action? (Clarke, 2007:102) Aquinas does not ascribe to an answer in the affirmative. He utilises the argument of the existence of many instances of a particularity – and the unity of these in the specific class perceived – to argue for a cause behind creation (2007:106-107).

“... [I]f in a number of things we find something that is common to all, we must conclude that this something was the effect of some one cause: for it is not possible that to each one by reason of itself this common something belong, since each one by itself is different from the others: and diversity of causes produces a diversity of effects. Seeing then that being is found to be common to all things, which are by themselves distinct from one another, it follows of necessity that they must come into being not by themselves, but by the action of some cause” (Aquinas, *De Potentia*, Q. 3, A. 5).

²⁰ “... Aquinas [deems]... the relation between creation and the ultimate source of all being as a non-reciprocal dependence relation, i.e., a relation in which subsistent effect... is dependent on its cause for its very existence as a subsistent entity, whereas the cause is in no way dependent on the effect for its subsistence, though there is a necessary logical relation between cause and effect, i.e. a relation which is perceived by the mind when it reflects on the implications of the existence of the cosmos” (Burrell, 2010:51).

²¹ The dogma of creation is a central tenet to the major Christian churches, having pride of place in the Creeds professed (Clarke, 2007:99-100). As a Christian, Aquinas would have sought to defend this.

For Aquinas, therefore, all things with being are classed as “beings”, each sharing in existence, with the same ultimate cause.²² Now, since creation of necessity requires a cause behind the act – unless one deems it possible for an action to occur without cause – a reasonable conjecture can be made that the uncreated Being commonly understood as not time, space or materially bound, is “the Creator”. The act of creation is an almost undeniable part of the history of the cosmos, for it is present in the contingent nature of being at each moment of existence.ⁱⁱ ⁱⁱⁱ Requiring the identification of the primordial agent to complete his causal cosmology, Saint Thomas pinpoints “God” as creator, because it is in accord with the nature of God to be creator (*Summa Theologica*, II, Ch. 21, §3, 4, Kretzmann, [1999]2001:54).^{iv} ^v

There are a number of claims that are contrary to the assertion that all things that exist were brought into being by God. Aquinas does not falter from considering these (Aquinas, *De Potentia*, Q. III, A. 5, *Summa Theologica*, I, Q. 44, A. 1 and A. 2).

In the first case, there exist things whose efficient cause is not God but another cause (that is, a secondary cause when placed beside primary causality that is bringing into being) (Aquinas, *De Potentia*, Q. III, A. 5, *Summa Theologica*, Q. 44, A. 1). Now, if this is the case, a thing can be understood without its relation to God: because God is not its efficient cause it can be that God is not necessary for the existence of that particular thing (*De Potentia*, Q. III, A. 5, *Summa Theologica*, Q. 44, A.1).²³

“Much more therefore can there be a real thing that is not from God” (De Potentia, Q. III, A. 5).

Furthermore, primary causality may be construed as ending in the bringing about of being from not-being (Q. III, A. 5). Thus, anything more than raw existence of primary matter – such as the “this-ness” of the particular thing – is not part of primary causality (Q. III, A. 5). Therefore, the conjecture can be made that the thing is not dependent upon God for its essence (Q. III, A.5). For, if primary matter is grasped as nothing but potentiality – that is, it is not an actuality – creation cannot be argued as having its *telos* in primary matter (Q. III, A. 5). This is because as an action, creation must end in actuality rather than in

²² But we are faced with a dilemma in terms of identification of this singular cause:

“... [E]ither we leave the many and its correlation with the One ultimately ungrounded, with no attempt at intelligible explanation at all, or else we must have recourse to some further hidden ultimate principle of unity” (Clarke, 2007:106-107).

²³ The problem of the causality of the secondary cause is not explained in this scenario.

potentiality (Q. III, A. 5). Hence, the argument may be made that primary matter is not the creation of God (Q. III, A. 5).

Finally, all things that are created have a subject (*Summa Theologica*, I, Q. 44, A. 2). But primary matter has no subject, since it is matter without form (I, Q. 44, A. 2). Thus, primary matter is neither created nor created by God (I, Q. 44, A. 2).

However, in response to each of these arguments, Aquinas asserts categorically:

“... [E]very being in any way existing is from God” (I, Q. 44, A. 1).

His argument is founded upon the need for causality in dealing with the existence of any being that cannot be its own cause (I, Q. 44, A. 1). According to Aquinas, no being apart from God is a non-created being (I, Q. 44, A. 1). The direct implication that can be induced, therefore, is that all beings apart from God are created because they cannot create themselves (I, Q. 44, A. 1).²⁴

For Aquinas, the commonality of being apparent in all existing things, suggests a singular cause for their existence (*De Potentia*, Q. III, A. 5). Upon perceiving many similar things, Aquinas emphasises that each particular thing that is similar to another is also unique to itself (Q. III, A. 5). However, the most shared dimension between all things is that they exist, i.e. that being is present in each thing (Q. III, A. 5). The common feature of being is more universal than any particularity, for it is not bound to the particular (Q. III, A. 5). Upon this judgement, Aquinas argues, no particular thing can be the generator of the commonality shared between all existing things (Q. III, A. 5). The cause must therefore be sought beyond the particular and in an entity capable of “holding” all apparent being as common (Q. III, A. 5). As particular being cannot be ascribed by any thing created, all being shared among particulars must be conceived of “... *as derived from the divine being...*” (Q. III, A. 5).

The consideration of being, though, is never in isolation to the particular thing: being is always only in terms of a thing (Q. III, A. 5). In Aquinas’ estimation, prior to the ascription of being to the particular thing coming into existence in the act of creation, the thing was not because it had not being (Q. III, A. 5). Following the act of creation – when the thing was brought into being from not-being – the thing was given being as that particular thing

²⁴ “... [S]uch a being cannot be without being caused” (Aquinas, *Summa Theologica*, I, Q. 44, A. 1).

(Q. III, A. 5). The thing is hence dependent upon God not only for its existence but also for its identity – its “this-ness” – as a particular thing that has been created (Q. III, A. 5).

The Ancient Greeks, though, argued that there was a difference between the matter out of which a thing was made and the substantial form of the thing itself (Aquinas, *Summa Theologica*, I, Q. 44, A. 2).²⁵ However, Aquinas argues, matter can never be grasped in isolation from thing (I, Q. 44, A. 2). Indeed, primary matter is always coupled with a particular form as a part of a particular substantial species (I, Q. 44, A. 2).²⁶

“... [So,] *it does not follow that it [primary matter] is not created under a form*” (Aquinas, *De Potentia*, Q. III, A. 5).

Therefore, the conclusion is made that as matter and form are inseparable in any particular thing, the contingency of the thing refers to the whole thing, including its primary matter (I, Q. 44, A. 2). It cannot thus be argued that God did not create primary matter (I, Q. 44, A. 2).

What, though, was the impetus behind God’s action of creation? It could be that creation was a natural impetus of God, that is, that God had no choice in creating but was compelled by God’s nature to do so. Alternatively, creation may have been the result of free and intelligent choice. Saint Thomas devotes a detailed section of *De Potentia* to the theme (Q. III, A. 15).

In his usual manner, Aquinas considers both sides of the argument. He begins with an exposition of Dionysius before moving on to Augustine (Q. III, A. 15). The argument from Dionysius is an analogical one, wherein the sun and its rays are compared to God who creates in a necessary manner – as the sun’s rays are emitted to bring forth light of necessity – in accord with its nature:

“... ‘As our sun neither by reason nor by Pre-election, but by its very being enlightens all things that can participate in its light, so the divine good by its very essence pours the rays of its goodness upon all things

²⁵ “... [M]atter is substance. But this is impossible; for both separability and ‘thisness’ are thought to belong chiefly to substance. And so form and the compound of form and matter would be thought to be substance, rather than matter. The substance compounded of both, i.e. of matter and shape, may be dismissed; for it is posterior and its nature is obvious. And matter also is in a sense manifest” (Aristotle, *Metaphysics*, Book VII, Part 3).

²⁶ It could also be argued that as matter has a particular quiddity (“thisness”) as matter – construed apart from substance in a thought experiment – it too belongs to the particular species of matter, and so has a substantial form, albeit in the universal category of “matter”.

according to their capacity.’ *Seeing then that the sun enlightens without reason or pre-election, it does so of natural necessity. Therefore God also produces creatures by communicating his good to them of natural necessity*” (Aquinas, *De Potentia*, Q. III, A. 15).

Similarly, Augustine provides the argument that God is essentially good, meaning that God is – of God’s nature – good (Aquinas, *De Potentia*, Q. III, A. 15). All of the acts of God are out of His goodness, because He cannot act save out of His innate goodness.²⁷ As such, the act of creation is a product of the goodness of God, Augustine argues, such that creation is a necessity – even a compulsion – for God (Q. III, A. 15).²⁸

To the contrary, however, for Aquinas, God created being from not-being, not of necessity, but in accordance with God’s free will (Aquinas, *De Potentia*, Q. III, A. 15, Kretzmann, 1991:215).²⁹ Thus, creation is not a natural act (Aquinas, *De Potentia*, Q. III, A. 15, Kretzmann, 1991:216).

In Aquinas’ estimation, the creative act is teleological, i.e. creation occurs with an end to which the action is moving, namely the bringing about of being (*De Potentia*, Q. III, A. 15). However, nature is not innately purposeful in the sense that it is not conscious of the result of the action it undertakes (Q. III, A. 15).^{vi} Instead, the act of creation can only occur as the action of an agent with the ability to plan and see to an end the action performed (Q. III, A. 15).³⁰

Furthermore, because prior to the act of creation there was nothing, that is, no time, space or matter, creation could not occur from outside of God (Q. III, A. 15). God’s willing of creation to occur is therefore a part of God’s essence, since before creation there was nothing apart from God (Q. III, A. 15). In this manner, God was conscious, understood, and acted out of God’s own will in the act of creation (Q. III, A. 15).³¹ Indeed, by creating God enacted freely, bringing forth the maximum of God’s goodness in accord with God’s own being (i.e. God’s goodness):

²⁷ “God’s will is determined to one thing, namely the good” (Aquinas, *De Potentia*, Q. III, A. 15).

²⁸ “... [A] good God made all things...” (Augustine, *Exposition on the Book of Psalms*, Psalm CXXIX).

²⁹ “... [W]ithout any doubt we must hold that God by the decree of his will and by no natural necessity brought creatures into being” (Aquinas, *De Potentia*, Q. III, A. 15).

³⁰ “... [Creation] is within the competency of a voluntary agent that can understand the end... [and] direct by his will: and thus God brought creatures into being by his will and not naturally” (Aquinas, *De Potentia*, Q. III, A. 15).

³¹ “God creates intentionally, that is, by intellect and will... God consent[s]... to the universe coming forth from God...” (Burrell, 2010:43-44).

*“... [T]he infinite goodness of God is manifested... in creation... God produces creatures not because He needed them, nor because of any other extrinsic reason, but on account... of His own goodness” (Aquinas, *Summa Theologica*, I, Q. 32, A. 1).*

While Aquinas argued for a creator that would bring about contingent being in the act of creation, attempts were made to discount the need for a creative-agent by appealing to eternity. In Book II, Ch. 34 of the *Summa Contra Gentiles*, Aquinas discusses this approach. In the argument for the eternity of matter, the requirement for a creator is apparently removed. However, this is not a fitting perspective.

Aquinas articulates the detracting position by beginning with a description of the causal chain of events within time:

“... [I]f a thing is made it must needs be made from something; and if the latter, also is made, then it too, must be made from something else” (Contra Gentiles, II, Ch. 34, §2).

However, if hypothetically, one follows this causal chain retrospectively in an eternal system, the ultimate material cause is never apprehended because infinity cannot be approached, continuing into eternity in accord with its nature (II, Ch. 34, §2). The assumption is then utilised – on account of the fact that one cannot get near to the infinite – that there must have been a first being that was not made by the act of anything else, such as would make the making of all other things possible (II, Ch. 34, §2, 5). Existing within the infinite, this material being must itself be infinite or else the causal sequence would not have been possible (II, Ch. 34, §2, 5).³²

Whilst the made is postulated as dependent for its being upon a material cause existing from eternity, this cause cannot be identified as “God” (II, Ch. 34, §2).³³ In other words, logically in addition to the eternally existing Being that is God, there must also be eternally existing primary matter (II, Ch. 34, §2, 5).

³² “Whatever is made has some pre-existing subject. And since this cannot go on indefinitely, it follows that the first subject was not made, but is everlasting” (Aquinas, *Contra Gentiles*, II, Ch. 34, §5).

³³ “... God... cannot be the matter of anything” (Aquinas, *Contra Gentiles*, II, Ch. 34, §2).

It is a reasonable empirical assertion that no matter can be changed without matter existing.³⁴ However, in the contrary argument against Aquinas' position, the action under consideration is always the "making" of something as opposed to the "creating". In this sense, it must be accepted that to make something one has already apparent – at the very least – primary matter. Making, hence, is a form of secondary causality. But any account wherein making is central does not account for why primary matter came into existence. If matter was eternal and not made, its causality has not been explained.

"... [T]he word making implies motion or change, whereas in the origination of all being from one first being, the transmutation of one being into another is... inconceivable" (Aquinas, Contra Gentiles, II, Ch. 37, §3).

A consequence of the Thomist distinction is that the argument that all things that are, are made from an eternal universe was in effect a straw-man.³⁵ By discussing making as opposed to creating, attention was distracted from the fundamental issue at hand, namely why anything is. This has resulted in a failure to adequately explicate the act of creation by refusing to acknowledge the appeal to transcendent causality. The Thomist tradition, however, ascertains the being of God from the experience of particular, contingent being (MacIntyre, 2009:75).

6.3.3. ***Divine Action: seeking out the Creator from the created:***

"... [M]an cannot obtain the knowledge of God by natural reason except from creatures. Now creatures lead us to the knowledge of God, as effects do to their cause" (Aquinas, Summa Theologica, I, Q. 32, A. 1).

The metaphysical seeking of primary causality via causal consequences is an exercise returning to the earliest times of theological discourse, which was also extant until early Modernity.^{vii} Unfortunately, both philosophical discourse and the advancement of science resulted in few theologians continuing to put the case forth for God detectable through the natural cosmos (Nichols, 2010:156-157).

In the philosophical sense – keeping with the post-Kantian tradition – the mind's movement from nature to God, i.e. from the thinking subject to the transcendent object

³⁴ "... [F]rom nothing comes nothing, is true as regards... particular making..." (Aquinas, *Contra Gentiles*, II, Ch. 37, §3).

³⁵ cf. Hartle & Hawking, 1983:2975, Susskind, 2012.

and to its cause, is impossible (Haldane, 1996:148, Hampson, 2009:65).³⁶ God, it is argued, should no longer be sought beyond sensory experience (Hampson, 2009:67). However, the abandonment of seeking transcendental causality does not result in the attainment of better understanding of contingent being.

Scientistically, physicalism has influenced the abandonment of Natural Theology in turning away from anything transcendent (Nichols, 2010:160, Hawking & Mlodinow, 2010:135, Krauss, 2012:145). God, for the physicalist, became a redundant entity, for “creation” is explained by the universe’s own natural processes, which have no *telos* in their effects (Nichols, 2010:160-161). Moreover, since suffering is present in the world, God must be discounted since a “good God” would not allow such pain to occur (2010:161).

To the first position it should be countered that physicalist accounts of causal entities do not provide a suitable response to the fundamental metaphysical problem (2010:161).³⁷ On the second charge, a *telos* in the continuing evolutionary process is discernable.³⁸ Finally, one may ask whether suffering is – of necessity – a negative experience in the broader consideration, particularly when it leads to genetic adaptations or extinctions in favour of more robust species that can survive evolutionary pressures?

Epistemological analysis of physicalist reductionism reveals still further weakness in the desertion of Natural Theology: the presupposition held that human knowledge is necessarily empirical (Haldane, 1996:149). To the contrary, the non-empirical should not be conceived as an unreliable source of knowledge (1996:149). The earlier discussion of the metaphysical presuppositions that enable science to occur should be held in memory. Indeed, non-empirically founded positions, such as belief, hypothetical judgements, thought experiments, past memories no longer empirically apparent, etc., may all result in postulations that conform to being (1996:149). It can thus be concluded that if not all knowledge has an empirical base then empirical reductionism is a weak attempt at

³⁶ “... [A]s a matter of logic we cannot reason from the conditions of the empirical world to the conditions of a transcendent super-empirical reality” (Haldane, 1996:149).

³⁷ “[Scientific c]osmology... has not succeeded in explaining the origin of the universe. The purported answers do not answer the question, but simply push it back to earlier unobservable stages...” (Nichols, 2010:171).

³⁸ “... [Evolutionary] incremental development... [is] always... towards increases in complexification, differentiation, and consciousness” (Scott, 2011:88).

evading the possibility of transcendent knowledge. A particular instance – relevant to this discussion – is the ignoring of primary causality.

Despite its attempted removal, then, the question of why anything has existence continues to stand, demanding – by being before the thinking subject – an account of its existence. No single-planed theoretical postulation can explain being.³⁹ An anti-reductionist stance which makes attempt at solving the metaphysical problem by transcending “hard” science by its nature, however, is the search for Divine Action by theologians and philosophers (Murphy, 2008:114).⁴⁰ The findings of evolutionary biology from Lamarck and Darwin through to those of the last century reinvigorated the search for God in nature in contemporary times (Peacocke, 2008:201). The enquiring human mind sought after an ultimate explanation for the existence of the processes undergirding evolutionary adaptations. However, this could not be filled by a conveniently intervening “God-of-the-gaps”. Indeed, God imaged as a “stop-gap” theoretical postulate will always be pushed aside and replaced by a more robust, empirical construct. Such is the actuality encountered by the relentless explanatory power of “hard” science.

“... [T]he successes of the sciences in unravelling the intricate... web of relationships between structures, processes and entities in the world have made it increasingly problematic to regard God as ‘intervening’ in the world to bring about events that are not in accordance with these... regularities that the sciences increasing unravel... [T]he whole epic of evolution from the ‘hot big bang’ to humanity has become intelligible in scientific terms” (Peacocke, 2008:203, 205).

Scientific exploration of the natural processes that result in the evolutionary development of the cosmos and all contained therein, including natural and biological entities, can be accounted for by natural, causal theories (2008:206). Naturally existing forces shape matter, evolutionary pressures adapt living beings to survive or to die out, etc., and all of these natural occurrences can be explained without appeal to any supernatural being that intervenes from without (2008:206). However, the natural principles that bring about

³⁹ “... [C]osmology and physics will never be able to describe or model the ultimate cause of the universe, nor of the laws of nature—that which effects the transition from absolute nothingness to existence and that which grounds the order of what exists” (Stoeger, 2008:230).

⁴⁰ In order for this work to remain focused upon the “problem of creation” – primary causality – the consideration in this section will be limited to universal “Divine Action” as opposed to particular “Divine Action”. Whilst universal “Divine Action” focuses upon the cosmological, that is, the primary emergence of being from not-being, particular “Divine Action” can be interpreted as referring to the involvement of the Divine in specific moments of time with special reference to individuals. The emphasis, therefore, stays on the level of philosophical speculation of the possible engagement of the Divine in the act of creation rather than at declarations of theological certainty from the subjective experiences of individual sentient beings.

changes in matter do so following the primary causal action of creation, that is, the bringing about of being from not-being as Aquinas proposed (*Contra Gentiles*, II, Ch. 37, 3, *De Potentia*, Q. III, A. 5, *Summa Theologica*, I, Q. 44, A. 1). These natural principles are secondary causes, that are graspable by natural science (Aquinas, *Contra Gentiles*, II, Ch. 37, §3, *De Potentia*, Q. III, A. 5, *Summa Theologica*, I, Q. 44, A. 1, Stoeger, 2008:225).

Imaging God as intervener in natural processes discounts the philosophical distinction between primary and secondary causality. The primary activity of God is as Creator – the Being that brings about existence – in a non-arbitrary way because it can be reasonably demonstrated that the process of bringing forth being from not-being is neither haphazard nor illogical. The structured product of creation, being, demonstrates the systematic hand of the Creator in reality. Secondary causality in natural processes, though, is not equitable with primary causality (Peacocke, 2008:203, Stoeger, 2008:225). Whilst the first brings forth being, the second only effects changes in already existing matter (Peacocke, 2008:203, Stoeger, 2008:225). God should hence not be reduced to a secondary cause as conceptualised as intervening in nature.⁴¹ Nevertheless, all beings are dependent upon God for God's primary causality, that is, for bringing their being into existence; this dependence for being lasts at all moments of being (Stoeger, 2008:225-226). Primary and secondary causality are thus processes both apparent in all instances of being:

“God gives existence to each instance of spacetime with all forms of matter-energy themselves dynamically and continuously and creatively being metamorphosed into new entities, forms and patterns” (Peacocke, 2008:202).

The identification of “God” as the Agent responsible for the action of creation does not have as its goal the proving that God exists. This is solely an act and an article of faith. The purpose, rather, is to show that because primary causality remains open-ended from the research and findings of physical and natural science, it is metaphysically plausible to posit that a being extra to physical reality is responsible for bringing about creation. For scholars of physical and natural reality, examination of these entities demonstrates the need for primary causality to be accounted for. Appeal then to the postulation that God – as a metaphysical, transcendent being, by definition – is creator, is founded upon the inference that the existence of God is arguably:

⁴¹ “A God who intervenes could only and rightly be regarded... as being a kind of semi-magical arbitrary Great Fixer or occasional Meddler in the... created, natural and historical networks of causes and effects” (Peacocke, 2008:205).

“... the best explanation of the very existence of the world and of its inbuilt rationality” (Peacocke, 2008:205).⁴²

The argument that God is the most fitting explanation for the existence of all that is, is fraught with difficulties. Indeed, that it is a postulation without empirical evidence – save for the unaccounted for contingent existence of being – readily opens it up to be decimated.^{viii} Moreover, the possibility of cogently framing this Causal Agent in linguistic terms is highly problematic.⁴³ Nevertheless, disproving the existence of God is more difficult than an immediate, emotive dismissal.

“... [Proving the non-existence of God] cannot be accomplished in principle because the unrestricted nature of God renders all methods of disproof fruitless” (Spitzer, 2010:229).

While the afore-quoted statement may appear sweeping, Spitzer’s articulation of why it is true provokes some thought. The argument that the existence of God cannot be disproved is founded upon two assertions concerning the transcendental: the limited nature of human knowledge to know the transcendent and the unbounded nature of the category of “God” as existing outside of space-time (2010:230-231).

To be able to disprove that an entity is not an extant possibility, it is required to prove that that it does not exist (2010:230). This would mean having knowledge of all possible entities, after which one could empirically declare that that thing is not (2010:230). However, the limited nature of the human, bounded by space and time, and the vastness of the known cosmos implies that it would be nigh on impossible to hold knowledge of all that exists (2010:230). While this argument is rooted in ignorance of what could possibly be known, it seems an unrealistic assertion that all knowledge is a possibility (2010:230). Thus, to certainly declare that God does not exist, would mean having to be all knowing

⁴² If God is not proposed as this transcendent being, another transcendent, ontological cause upon which all created things are dependent for their existence would have to be put forth.

⁴³ As time and spatially bound, embodied creatures, humans can only conceptualise and understand in temporal – as opposed to transcendent – terms. Hence, when attempting to represent God, human limits play a role, certainly not providing the person with “... *an adequate description of God the Creator, nor therefore of God’s relationship to the world*” (Stoeger, 2008:234). The best representation that the thinking subject can, therefore, construct of God is an analogous portrait, but never God as God is (2008:234). This is augmented by the fact that God’s nature is so very distinct from anything experientiable, perceivable, or thinkable by the human (2008:234). Abstractions about God must always, consequently, be deemed as only ever partial extrapolations that emerge from knowledge of what is inferred as the outcome of God’s creative action, that is, nature.

before showing that God is not amidst the knowledge one holds. This does seem an unlikely possibility.

Additionally, God could theoretically be disproven by demonstrating that the category of “God” has a boundary excludable from the category of what is extant (2010:230). This would make God’s existence contradictory to established fact (2010:230-231). However, it is problematic to establish the boundary of the Divine category. God is, per definition, not bound by temporal limits because of God’s transcendent nature which is without space and time (2010:231).

“[Hence t]he boundaries of a finite thing cannot exclude the boundarylessness of God” (2010:231).

The identification of the categorical difficulties with attempts at disproving God’s existence adds support to the core argument of this research. Moreover, this is strengthened when coupled with the position put forth that a transcendent cause of being is required for a suitable account of contingency. Thus, it is reasonably conjectured – in light of Natural Theology’s progression from the created to the Creator – that God is the primary cause of contingent being. Still, numerous attempts continue to be made to disprove God, and as a consequence to demonstrate that being is not caused by any Divine or transcendent cause.

6.4. Being as non-Divine:

6.4.1. *Introduction:*

The positivistically-inspired physicalist critique of transcendental, metaphysical theories is an influential trend in philosophical discourse. Accordingly, causal metaphysics – as has been argued for in this work – are discounted because they make appeal to the activity of a Being, God, transcendent of sensory experience. Because this study has focused upon Natural Theology – that is, intellectual movement from created to the cause of creation – as a potential solution to the “problem of creation”, it is of relevance to consider whether Natural Theology has viability in the current knowledge economy. To attempt towards a response, Natural Theology must “face-off” against physicalist, anti-metaphysical positions.⁴⁴

⁴⁴ As noted in the preceding chapter, physicalism is itself a metaphysical stance for claiming more about the nature of reality than can be ascertained from physical and natural science alone.

The singular advantage of Natural Theology is that in its study of physical and natural science – and the resultant movement towards metaphysics following questioning of “hard” science’s findings – there is an encounter with being. For the physicalist, being is not encountered as being in the action of removing the metaphysical question of why anything is. Instead, things are only studied in their particular terms. Thus, the physicalist vilification of Natural Theology deconstructs the findings of this research work in the argument that the problem of existence should not be posed as it has no meaningful content. From this perspective, this research has been in vain.

Since the philosopher cannot develop the impossible “proofs” for God’s existence, it has been noted that proving God’s existence is not our purpose. Instead, the postulation that God is the cause of all being is a result of the problem that being exists and requires justification for its existence. This “argument from contingency” necessitates a metaphysical foundation. However, that “God” has been identified as Creator – because the argument appears to be the most satisfactory account of why there is anything – is not the central issue at hand. Rather, the essential subject is that contingent being requires a metaphysical base, the existence of which can be reasoned about and inferred from the exploration of the causal nature of being. The extrapolation to God as Creator is, therefore, a convenient, probabilistic outcome of the need for a metaphysical and transcendent cause as the characteristics of “God” *fit* the categories required of a primary cause.

God will now be problematised. As Natural Theology speculates that God exists and acts as the ultimate ground of being from the study of nature, the matter of whether knowledge of God as transcendent Being is possible, from the study of immanent being arises. Furthermore, that God is presumed to exist without cause, the conjectured necessity of God’s existence needs to be queried. Moreover, the transcendent nature of God would imply that knowledge of God is knowledge of the transcendent. As immanent beings, can the human infer transcendent knowledge far out with the existence or capacity of the thinking subject? And, can God be identified as “being”?

6.4.2. ***Does nature lead to knowledge of God?***

Scholastic philosophy methodologically presupposes that it is reasonable to progress in thought from the thinking subject’s experience of things to the cause of the being of the thing, named as “God”. This process arises by questioning why the thing exists. However,

a chasm stands between physically experiencable being and knowledge of the theoretical postulation that a particular thing has a transcendent cause outside the embodied reach of the thinking subject. Hence, how can it certainly be established that nature leads to knowledge of God as transcendent cause?

In truth, empirical evidence for the identification of the primary causer as “God”, cannot be had. Conviction emerges solely from the rational perspective of faith. Therefore, the utilisation of reason in the inference can lead to likely knowledge, though not sensorily founded. That being cannot account for itself aids the reasoned corollary.

In inducing that God is the transcendent cause of being an empirically unverifiable tenet comes to be held. It should be noted though, that there is established precedent for the postulation of non-sensorily testable entities even within the theoretical constructions of “hard” science. One need only think of atoms, subatomic particles, quanta, quarks, dark matter, and the like. It is a true assertion that merely because something has not been empirically experienced does not necessitate that that thing does not exist. As has been pointed out, the vastness of the cosmos makes non-empirically founded assertions of non-existence rather reductive.

Setting aside religious and ecclesiastical bias contra-God, it can be confidently affirmed that in requiring a source for the coming into existence of primary being, a transcendent cause can be inferred. Every extant moment of particular being directs toward a response to the question begged in each thing’s existence: that that thing’s primary being must have been caused by the act of an Agent other than itself. Indeed then, temporal being does broadly direct toward a primary causer. With faith, this transcendent cause is interpreted as Divine.

6.4.3. ***Does the existence of the cosmos necessitate the existence of God?***

Physicalism argues that the cosmos requires no explanation outside of itself for existence (Hawking & Mlodinow, 2010:135, Krauss, 2012:145).⁴⁵ It would seem that if the universe is a self-causing entity, then it is not necessary that God – or more generally, a transcendent primary cause – exists.

⁴⁵ Carroll, 2011.

The proposition that God is the cause of being emerges from the notion that the cosmos is contingent, with the best account thereof being the action of a necessary, transcendent Agent in the bringing about of being (Smart, 1996:39). Such has been the argument offered in this chapter. Ignoring the Thomist clarification between primary and secondary causality, though, Smart argues that the postulate of God as necessary is weak (1996:41).⁴⁶ This position emerges from the Atheist perspective, wherein the universe is conceived as the sole necessary entity, contingent upon nothing outside of itself for its existence (1996:41). Beyond the universe there is purportedly nothing, for there is no empirical evidence of anything outside the space-time that can be known (1996:41).

“... [W]e can easily imagine self-contained descriptions of the universe that have an earliest moment of time... [W]ith the successful post-Big Bang cosmological model already in our possession, that would constitute a consistent and self-contained description of the history of the universe.”⁴⁷ ix

Without a contingent universe, there is no need for the action of God (Smart, 1996:41). However, the universe here is conjectured as responsible for the coming into being – the primary causation – of itself.⁴⁸ That particular things within the cosmos cannot bring forth things into being but can only change things that have being (secondary causation), implies that a straw man argument has been given. Indeed, the necessary proposition that the universe brings itself into being has been argued for, as opposed to God being discounted as the Agent of primary causality.

A response to the counter argument seems unfalsifiable, in its separating itself from the requirement of explanation. In a critical voice, Carroll declares:

“... [Arguments for primary causality] all arise from a conviction that... it is insufficient to fully understand what happens; we must also provide an explanation for why it happens... [T]he ultimate answer to ‘We need to understand why the universe exists/continues to exist/exhibits regularities/came to be’ is essentially ‘No we don’t’.”⁴⁹

⁴⁶ cf. Aquinas, *Contra Gentiles*, II, Ch. 37, §3, *De Potentia*, Q. III, A. 5, *Summa Theologica*, I, Q. 44, A. 1.

⁴⁷ Carroll, 2011.

⁴⁸ “So long as the universe had a beginning, we could suppose it had a creator. But if the universe is really self-contained, having no boundary or edge, it would have neither beginning nor end, it would simply be. What place, then, for a creator?” (Hawking, 1988:156).

⁴⁹ Carroll, 2011.

It must be acknowledged that the processes apparent in the natural world contribute toward the emergence of further entities within the cosmos. However, do these processes merely materialise themselves uncreated within the cosmos? Retrospective analysis of cosmic processes will lead eventually to the questioning of the existence of these primary processes that have given rise to changes in matter, but which have not brought about being from not-being. As with all other extant things, natural processes have been ascribed being via primary causality in order to enact what is properly theirs to do; namely secondary causation.

Without venturing, then, into the theological discussion of the contents of the identity of “God”, does the existence of being necessitate the existence of God? Lonergan problematizes this theme in the context of the thinking subject’s knowledge of being ([1957]1970:669). Once more, the method of Natural Theology shines forth: knowledge of God emerges from knowledge of being.

“... [T]he real is being, and apart from being there is nothing. Being is not known without reasonable affirmation, and existence is the respect in which being is known precisely inasmuch as it is affirmed reasonably” ([1957]1970:669).⁵⁰

Thus, in declaring knowledge of being, the thinking subject is not merely developing a mental construct ([1957]1970:673). Rather, the knowledge held is *of* what exists ([1957]1970:673). But this existence is conditional upon something apart from being, an ultimate ground of being that, it must be inferred, is not contingent for its own existence ([1957]1970:656).⁵¹

“God would be the creator. For if God’s efficient causality presupposes the existence of some matter and was limited to fashioning and ordering it, then the existence of this matter would be unexplained; but what ultimately is unexplained, does not pertain to being: and so the alleged matter would prove to be nothing” (Lonergan, [1957]1970:663).⁵²

⁵⁰ Knowledge of being presupposes the existence of being, for one cannot know that which does not exist. Hence, the being of being stands independently from knowledge of being, and is not dependent upon knowledge of being for its existence. Nevertheless, knowledge of being is entirely dependent upon being’s existence to be known.

⁵¹ *“The final cause... is the ultimate cause for it overcomes contingency at its deepest level”* (Lonergan, [1957]1970:657).

⁵² For although being is prior to the affirmation of being, being can only be known by the thinking subject when it is reasonably affirmed as extant (Lonergan, [1957]1970:634, 669).

Therefore, this research responds in the affirmative: God is necessary for being to be. In so far as particular beings that constitute the cosmos cannot bring about existence from something that does not exist, the need for a transcendent Cause of being remains and is inferred as necessary for the being of all contingent entities.

6.4.4. *The impossibility of transcendent knowledge:*

The appeal to a transcendent and necessary cause as a response to the metaphysical “problem of creation” relies upon knowledge beyond the sensory experience of the thinking subject. For, if God – the necessary cause – is transcendent, it follows that claimed knowledge of God is transcendental knowledge. In the post-Humean and Kantian philosophical milieu this is a difficulty in that transcendent knowledge is not empirically founded.^x

“One of the main lessons of modern thought is that we should be... suspicious of the transcendent... [and] of any claims to enjoy epistemic access to the transcendent. More specifically, we should be suspicious of any claims to enjoy epistemic access to anything that transcends what we experience—whether that be the world ‘in itself’ or any other supra-empirical reality” (MacDonald, 2009:xiii).

However, post-Kantian scholarship has remained satisfied with the critique of transcendent knowledge (Lonergan, [1957]1970:641). Contrary to the Modernist, critical trend, it will be argued that contingency of being directs to the necessitation – and intelligibility – of transcendent knowledge, conceptualised in “common” understanding as: that which is disparate from knowledge of the immanent ([1957]1970:634).

Immanent knowledge, though, transcends empirically received information, too. After all, to have knowledge of something implies judging both sensory and perceptual contents in order to understand ([1957]1970:635). Grasping knowledge – the thinking subject’s reflection upon sensory data – implies that in conceiving the subject moves beyond “raw” sensory data into the realm of what is *considered* as part of reality ([1957]1970:635).⁵³ Reality, however, is only constituted by the existent, i.e. that which has being ([1957]1970:638).⁵⁴

⁵³ “... [I]nquiry leads to understanding, reflection leads to affirmation; and being is whatever can be grasped intelligently and affirmed reasonably” (Lonergan, [1957]1970:638-639).

⁵⁴ “... [A]part from being, there is nothing” (Lonergan, [1957]1970:638).

“If, apart from being, there were something, that something would be, and if that something were, it would be another instance of being and so not apart from being” ([1957]1970:638).

Transcendent knowledge of being imbibes every moment of reality ([1957]1970:638). However, from experience of particular dimensions the course to transcendent knowledge of being must be further elaborated ([1957]1970:641). This is given in what “being” itself is: the universal category within which all existing things are placed.

“The pure notion of being... is prior to understanding and affirming, but it leads to them for it is the ground of intelligent and critical reflection... [B]eing is completely universal and completely concrete; apart from it, there is nothing...” ([1957]1970:642-643).

The extrapolation occurs from sensory experience of particular instances of being to the awareness of common features between particular entities. In this process, the thinking subject is directed – by being before her consciousness – “... to the transcendent idea of being” as a universal category of understanding ([1957]1970:644). In affirming being as a general feature of the existent the causality of being emerges: no particular being can bring forth being from not being, hence, making all being contingent for its existence ([1957]1970:654).

“If nothing existed, there would be no one to ask questions and nothing to ask questions about. The most fundamental of all questions, then, asks about existence yet neither empirical science nor a methodologically restricted philosophy can have an adequate answer” ([1957]1970:653).

Without causal explanation, being simply is without account, similar to Carroll’s argument given above (Carroll, 2011, Lonergan, [1957]1970:655). However, argues Lonergan, if being is that which can be reasonably grasped by the intellect, an explanation for the being of being must be given ([1957]1970:638-639, 656). The intelligibility of being resides in the identification of being as contingent, accomplished in the preceding chapter. Indeed, this contingency places upon the thinking subject conceiving of being, an awareness that being just is not but is the result of an act by a Being unlike any other in its transcendence of contingency ([1957]1970:657). This Being is “labelled” by classical Western theology as “God” (Lonergan, [1957]1970:657, MacDonald, 2009:xii).⁵⁵ How can knowledge of this

⁵⁵ “... God [enjoys]... an existence that is necessary... ‘outside’ or ‘beyond’ the natural world” (MacDonald, 2009:xii).

transcendent Being be had, though, in light of the critique that human cognition cannot extend further than the thinking subject? (MacDonald, 2009:xi)^{xi}

A potential means of gaining access to the transcendent is to lessen the gulf between human knowing of the immanent subject and the Divine, transcendent object (2009:xvi). This would appear to be a necessary act, as the embodied nature of the human thinking subject prevents access into transcendent reality. In bridging the gap, the Divine would be construed as less totally “other” in relation to the human.

If the boundary between immanence and transcendence is crossed in the thinking subject conceiving of God within the immanent side of the boundary, God comes to be construed as no longer completely other to the subject (2009:xvi). Indeed, God is then subject to the thinking and understanding of the thinking subject (2009:xvi). Consequently, however, while God is totally knowable to the subject, God is also reduced to a construction of the thinking subject’s mind (2009:xvi). In this attempt at grasping the Divine transcendent, an unsatisfactory result is obtained. All attempts at conceptualising the transcendent results in the imposition of human categories of understanding upon God (for this is all that can be done). Nevertheless, the being of God as primary cause of contingent being must be asserted as independent of human cognitive construal.

An alternative endeavour at accessing the Divine has to hence be made. MacDonald proposes that an approach more fitting with the image of God as primary cause is the total removal of boundaries – in the understanding of the thinking subject – between immanence and transcendence (2009:xvii).⁵⁶ As the Agent behind primary causality of immanent entities, God – in God’s self – is neither immanent nor transcendent, but simply God who is unbounded by humanly inflicted categories.⁵⁷ By reconceptualising no boundary between the immanent and transcendent, the question of whether it is possible to know the transcendent is removed (2009:xviii). Indeed, such a removal of the divide cutting off the transcendent from human knowing was argued for by Aquinas (MacDonald, 2009:138, Aquinas, *Summa Theologica*, I, Q. 12, A. 1).

⁵⁶ In the previous attempt, the boundary between immanence and transcendence remained, by God being brought into immanence (MacDonald, 2009:xvii).

⁵⁷ The construal of a boundary between the immanent and transcendent is merely a human construction, and not of necessity a reflection of the nature of the “transcendent” (MacDonald, 2009:xviii).

The human cognitive constructions of God – conceived as either absolutely transcendent or as brought into immanence on “this” side of the boundary divide – makes God a matter of the thinking subject’s thoughts. However, by removing the separation between God and particular beings, God is affirmed as a real entity (Lonergan, [1957]1970:669).

“... [T]he real is being, and apart from being there is nothing. Being is not known without reasonable affirmation, and existence is the respect in which being is known precisely inasmuch as it is affirmed reasonably. Hence, it is one and the same thing to say that God is real, that he is an object of reasonable affirmation, and that he exists” ([1957]1970:669).

Contingent being, affirmed as extant – making it a reality for the thinking subject and not a meagre cognitive construal – directs to the realness of the Agent-cause of the being of the contingent ([1957]1970:669, 673). As a result of this existence and contingency, it is reasonable to assert that because all that can be known has being, this same being must have a cause that is the explanation of the being of the thing ([1957]1970:675).⁵⁸

“... [I]f God’s efficient causality presupposed the existence of some matter and was limited to fashioning and ordering it, then the existence of this matter would be unexplained [as there would be no primary cause thereof]; but what ultimately is unexplained, does not pertain to being: and so the alleged matter would prove to be nothing” (Lonergan, [1957]1970:663).

In this manner, God’s existence is declared by the thinking subject as true.⁵⁹ In a similar vein, because of the argued for existence of God – as demonstrated by the causality of contingent being – Aquinas’ is able to also make the affirmation that the Divine is knowable (*Summa Theologica*, I, Q. 12, A. 1).⁶⁰ However, Aquinas adds, there is a proviso on knowledge of the Divine: while something may be knowable to itself, the limits of knowing by virtue of the embodiment of other knowers precludes the necessitation that knowledge of another being is possible for those different knowers (I, Q. 12, A. 1). Nevertheless, the thinking subject wonders about her own being, and in so doing, poses questions about her causality that is directed beyond her being, because contingent being cannot create existence (I, Q. 12, A. 1).

⁵⁸ “... [A] process identifies the real with being, then identifies being with complete intelligibility, and finally identifies... [that] God... accounts for everything else” (Lonergan, [1957]1970:675).

⁵⁹ However, no attempt towards a flawless proof is given.

⁶⁰ “Since everything is knowable according as it is actual, God, Who is pure act without any admixture of potentiality, is in Himself supremely knowable” (Aquinas, *Summa Theologica*, I, Q. 12, A. 1).

“... [However, as God] is His own existence... the [contingent] creature... is related to Him as the effect of its cause, and as potentiality to its act; and in this way the created intellect can be proportioned to know God” (I, Q. 12, A. 1).⁶¹

6.4.5. **The “non-being” of God:**

The Heideggerian attempt at overcoming being forms the foundation of Jean-Luc Marion’s own argument that being should be removed in the conceptualisation of “God” (1991).⁶² From his theological background, Heidegger noted that one should not try to explicate God utilising particular terminology, but should rather remain silent about God:

“Someone who has experienced theology in his own roots, both the theology of the Christian faith and that of philosophy, would today rather remain silent about God when he is speaking in the realm of thinking” (Heidegger, 1969:54-55).

Given that God is so other to the human experience, Marion argues, the proposal to keep silent concerning God does not come as a shock revelation (1991:55). Indeed, the human has no other way of understanding apart from within the human reasoning ability, thus God is understood only as a projection of the consciousness of the thinking subject (1991:59). God, therefore, is created as an idol – an analogous understanding – of the thinking subject when silence about God is not kept (1991:59). So understood from the activity of the thinking subject, God is never graspable upon God’s own terms *an sich*.

“Hence, by not keeping silent, by covering it with our busy chattering, we silence that which silence alone, possibly, could have honoured...” (1991:60).

Silence would have been a potential means by which the thinking subject could have encountered God. However, argue Heidegger and Marion, human cognitive impositions upon God limit the divine to representations as opposed to permitting God to remain as God actually is. If the human can only conceive on human terms, how can our “idolatry” be overcome? It is in the process of liberating God from all labels generated by the thinking subject! This, Heidegger puts forth, includes the concept of “Being”, for God

⁶¹ The emphasis is the author’s insertion.

⁶² b. 1946.

cannot be equated with Being (Heidegger, 1978:436, Marion, 1991:61). In fact, argues Heidegger, “Being” is not even a term proper to theological discourse (1976:64-65).⁶³

“Der Glaube hat das Denken des Seins nicht noetig. Wenn er das braucht, ist er schon nicht mehr Glaube... Mit dem Sein, ist hier nichts anzusehen. Ich glaube, dass das Sein niemals als Grund und Wesen von Gott gedacht werden kann, dass aber gleichwohl die Erfahrung Gottes und seiner Offenbarkeit (sofern sie dem Menschen begegnet) in der Dimension des Seins sich ereignet, was niemals besagt, das Sein koenne als moegliche Praedikat fuer Gott gelten” (Heidegger, 1978:436).⁶⁴

If “Being” is dissonant from God and faith, the term should be precluded from theology (Marion, 1991:62-63). The alternative, if God remains as conceived in terms of “Being”, is that God is reduced by the label assigned (1991:70). And, asks Marion, why should this be the case? (1991:70). In Thomist thought, God is being:

“... [S]ince every thing which is not existence alone has a cause of its existence... It is clear, therefore, that an intelligence is form and existence, and that it has existence from the First Being, which is existence alone. And this is the First Cause, which is God” (Aquinas, *De Ente et Essentia*, §80).

This assertion finds its origins in the work of Avicenna, as acknowledged by Saint Thomas (Marion, 1991:70).⁶⁵ But, argues Marion, the primacy of the First Being – the representation of the thinking subject’s mind of God – rests not in itself, but upon the intellect of the understander (1991:80). Therefore, “Being” is not primary. It is construed following reason, which implies that the reason of the thinking subject in the construal is in fact primary when God is attempted to be grasped (1991:80). As such, it may be concluded that the identity of God is never grasped by any limited concept, such as “Being”, for God – in God’s self – is inexpressible (1991:106). Silence, Marion proposes,

⁶³ “... ‘Being’ is an untheological word. Because revelation itself determines the manner of manifestness and because theology does not have to prove or interpret ‘Being,’ theology does not have to defend itself before philosophy...” (Heidegger, 1976:64).

⁶⁴ Marion translates Heidegger as follows:

“Faith does not need the thought of Being. When faith has recourse to this thought, it is no longer faith... Of Being, there is nothing here to expect. I believe that Being can never be thought as the ground and essence of God, but that nevertheless the experience of God and of his manifestedness, to the extent that the latter can indeed meet man, flashes in the dimension of Being, which in no way signifies that Being might be regarded as a possible predicate for God” (1991:61-62).

⁶⁵ “... [B]eing is what is first conceived by the intellect, as Avicenna says...” (Aquinas, *De Veritate*, Q. 21, A. 1, 2008c:6).

should be the response of the thinking subject in the encounter with the divine, thus setting God free from the bonds of the human's idolatrous understanding (1991:107).⁶⁶

However, it has been argued that God is graspable as being since contingent being directs to a cause that is itself non-contingent:

“... [I]t is one and the same thing to understand what being is and to understand what God is” (Lonergan, [1957]1970:658).

The act of creation is the most awe-inspiring and remarkable happening: from nothingness, material entities emerged through the action of primary causality. Labelling God as the “*First Being*” does not “idolise” the divine, but rather does what Marion also seeks in his silence: heralding the divine, though here through the majesty of created entities’ being (Aquinas, *De Ente et Essentia*, §80, Marion, 1991:107). Although human understanding of the divine is of necessity limited, the existence of God apart from created being suggests that even with limited grasp of God, God is not limitable ontologically by God’s creation.

It should be interrogated whether humanity’s understanding of God has any bearing upon the ontological identity of God. God’s existence is prior to other being’s that are contingent upon God for the existence of their created being. Hence, it can be contended that God is not limited in God’s identity by any cognitive projection upon God. God is, after all, not contingent but necessary. Thus, regardless of the inability of humanity to completely grasp the divine nature in its particular utilisation of concepts and imagery, God stands as God’s self apart from any restricted or reduced understanding, as the ground of being, the “*First Being*” (Aquinas, *De Ente et Essentia*, §80).⁶⁷ This article of faith is consistent with the earliest expressions of Christian faith:

“... *In him we live and move and have our being... [f]or we too are his offspring*” (Acts 17:28, New American Bible: Revised Edition).

⁶⁶ “We must guard our silence like a treasure... This silence... knows where it is, whom it silences, and why it must... preserve a mute decency—to free itself from idolatry” (Marion, 1991:107).

⁶⁷ “We suppose ourselves to possess unqualified knowledge of a thing... when we think that we know the cause on which the fact depends... and further, that the fact could not be other than it is” (Aristotle, *Posterior Analytics*, Book I, Part II).

6.5. The unity of human knowledge of being:

Understanding of the existence of being and the contingency of being point to the need not only to have physical and natural science, that is knowledge of *how* being is, but detailed understanding of *why* anything that is has existence.⁶⁸ The path followed in this chapter to reach this necessity embraces that of natural philosophy; from sensory experience and the development of theories of physical and natural science, the importance of metaphysics emerges in considering being.

It is a certainty that this path is rather different to the more commonplace contemporary fragmentation of knowledge systems evident in the positivist-physicalist lines of thought previously discussed. As opposed to the integration of disciplines – through which different aspects of knowledge interlink, feed off one another and provide information for better understanding – reductionist, one-sided epistemologies have emerged as all-pervasive worldviews.

In order to grasp the complexities of reality, humans have always had to divide the experienced up into wieldy, processable, and then, understandable chunks (Bohm, [1980]2002:2). Humanity's limits in terms of knowledge acquisition extend from the particular perceiving subject into the sciences that are the product of individual cognitive activities. The tentativity of science as well as it frequently positing falsifiable conjectures, in like manner, direct to the constraints upon human knowledge of extending its hold upon reality ([1980]2002:21-22). The restricted situation of human knowledge is aggravated by the over-delineation of the sciences into highly specified, incommensurable paradigms.⁶⁹

The confidence asserted in particular disciplines' abilities to explain precise phenomena, Bohm surmises, emerges from a naïve epistemic assumption on the part of disciplines' propagators that they have objective access to these ([1980]2002:4). The reader will note that access to the reality of beings is impeded by the thinking subject's involvement in the generation of knowledge, even from the initial activity of data collection. Nevertheless,

⁶⁸ "... [A]s in the case of other kinds of causes the status of a secondary cause depends upon that of the primary cause, but that of the primary cause depends upon no other; so also in the case of final causes secondary ends share in the status of final cause from their relation to the last end, but the last end has this status of itself" (Aquinas, *Truth*, Q. 21, A. 1, 2008c:7).

⁶⁹ "... [A]rt, science, technology, and human work in general, are divided up into specialities, each considered to be separate in essence from the others. Becoming dissatisfied with this state of affairs, men have set up further interdisciplinary subjects, which were intended to unite these specialities, but these new subjects have ultimately served mainly to add further separate fragments" (Bohm, [1980]2002:1).

over-specified disciplines result in an emphasis upon particular dimensions at the expense of others:

“... [I]f we regard our theories as ‘direct descriptions of reality as it is’, then we will inevitably treat these differences and distinctions as divisions, implying separate existence of the various elementary terms appearing in the theory” ([1980]2002:9).

In consequence, reality is perceived as initially constituted by fragments, and subsequently as only portions to be accounted for by reductive theories wherein the complexity of reality is held as conceivable by particular disciplines ([1980]2002:9). Such has been the situation in the severing off of metaphysical enquiry from the sciences, in its having been deemed as non-empirical, meaningless and inconsequential to the findings of “hard” science.⁷⁰

However, being is not divisible: every entity stands in its unified ontological complexity as distinct, in relation to other objects, and a thing contingent for its existence upon something outside of itself ([1980]2002:20). If any dimension of the being is removed, it no longer has the identity it would have had in its unified form. Thus, for knowledge acquisition to occur in terms of the fullness of the thing’s existence, inquiry must be done as a whole. Hence, Maritain puts forth:

“Not only does science begin with or start from the individual, but it terminates in the individual” (Maritain, 1957:11).

In their ontic unity, all beings encountered plea the thinking subject to consider them as indivisible wholes and to generate theoretical models of their being that includes this oneness.⁷¹ Such an effort has been made in this work by considering “hard” science as a singular component of the fuller gamut of knowing as informed by the Aristotelian-Thomist understanding of “*scientia*”.^{xii} By emphasising the importance of metaphysical inquiry as a component of “*scientia*” – which follows from study of the material dimensions of existence – a bid has been inferred to deliberate over the manifold extent of all beings.

⁷⁰ The scientific paradigm has done just this in considering physical and natural science as the sole sources of “real” knowledge, despite the continual, yet unaccounted for, encounter with being faced by the “hard” scientist in her scientific explorations (Bohm, [1980]2002:11).

⁷¹ In perceiving entities out with the self, the thinking subject comes into contact – at every moment of her own contingent being – with the contingency of other beings. That causality is not a problem readily removable from the being of things, materialist reductionism of being to one plane of existence is set aside by the physicalist’s own conscious neglect of being.

6.6. Conclusion:

The problem of causation is a pinnacle cosmic theme oftentimes skirted by contemporary reductionist epistemologies. However, it has been argued that causality is present at each moment of being as a direct and logical product of posing the primordial metaphysical question about things asserted to by physical and natural science: why is there anything? As such, being has been modelled as multi-layered, and so requiring numerous approaches to effectively grasp its complex layers. In the development of a theoretical method that deems knowledge as the fruition of multiple planes of investigations, the proposal has been made that the seeming impasse between “hard” science – understood as the sole path to knowledge – and metaphysics can be overcome through an integrative approach. This is in accord with the tradition of natural philosophy present from early Greek through Scholastic and early Modern thinking.

A possible solution to the “problem of creation” argued for in this chapter rests upon reasonable faith. This, it has been claimed, develops from the metaphysical, contingent requirement for a transcendent cause which in its nature is analogous to the article of faith that God – as a transcendent and necessary Being – created (Blanchette, 2007:145). Thus, metaphysics leads to an overlap between philosophy and faith in the suggestion that a cause outside of temporal being is necessary to explain its existence. This position dates to the earliest philosophical works: Plato and the Stoics (Plato, *Timaeus*, 39d-39e, Diogenes Laertius, Book VII, Ch. 1, §136). It was then carried over into the Judaeo-Christian tradition, later to be clearly articulated by Aquinas, other scholastics, and the Natural Philosophers of early Modernity (Armstrong, [1993]1999:56, Aquinas, *Contra Gentiles*, I, Ch. 79, §2, Newton, 1846:504, Galileo, [1615]2008:128).

The theological content of the proposition that God is the primary cause of the existence of being has not overtly been delved into, however, for this is the task of the theologian, not the philosopher. Nevertheless, it has been put forward that the assertion of the identification of God as the primary cause is a rational inference. This is a consequence of the conditional – as opposed to necessary – nature of being. In this contention, an explication for being’s cause – rather than denying contingency or asserting that things are contingent without exploring the cause behind the contingency – was proposed.

Essentially, it is argued that the created – things with being in time and space – cannot bring forth creation, thus, it is inferred that of necessity a transcendent cause must be invoked (Aquinas, *Contra Gentiles*, I, Ch. 49, §4). As transcendent by God’s nature, God

is so speculated to be the cause behind contingent being (Aquinas, *Contra Gentiles*, I, Ch. 49, §2, 4, Ch. 79, §2). Contingent being therefore has being because God both exists and creates.

Nevertheless, as a non-scientific assertion – in the sense of “hard” science’s method – the argument that the Divine Being is the primary cause of being does not rest upon empirical evidence. There is no observational method of proving either the existence or the creative actuality of God. Still, in this schema an endeavour has been made to respond to the reasoned requirement for a necessary, non-contingent primary cause, as demonstrated philosophically and held by faith (Aquinas, *Commentary on the Sentences*, II, distinction 1, Q. 1, A. 2 in Baldner & Carroll, 2007:74). The purpose behind this argument is the development of a causal justification for how from nothing something came forth. This stands in contradiction to the mindful ignoring of the problem of being by many contemporary scholars.

Indeed, the “problem of creation” is not a scientific problem; hence, it is not resolvable by scientific method. It is, hence, to a non-scientific system of knowledge, namely metaphysics, which transcends the limited nature of science that appeal must be made, in order that knowledge beyond science could be grasped. In hypothesising a metaphysical elucidation to the “problem of creation” a contribution is made toward the development of more complete knowledge of things. Herein, the intellect encounters being such that truth – as the conformity between being and intellect – can be apprehended (Aquinas, *Summa Theologica*, I, Q. 16, A. 2). Truth of the metaphysical dimensions of reality, can however, never contradict other true knowledge whereby conformity between being and the mind of the thinking subject has been made, for example, in “hard” science (Aquinas, *Contra Gentiles*, I, Ch. 7, §1, Pius IX, [1871]1877:248). All truth – it is argued – if true, share in being by conforming to it. It could, thus, be inferred that all true things have their unity in being, provided that perfect representations of being are carried by the mind of the thinking subject.

This oneness of truth in being directs to an ultimate cause, as metaphysical argumentation is given credence along with empirical science. It is, therefore, reasonable to suggest that the contingency of being is reliant upon God for being. However, to anyone that seeks to philosophically or empirically prove the existence of God the following injunction must be given, as proclamation of the certainty of God is a matter of reasoned faith but not of reason alone:

“... [P]hilosophers whose enquiries lead them to the conclusion that God does exist, and that he is who and what theistic believers say that he is, have to recognise that, insofar as their belief is supported by argument, it has no more philosophical warrant than that provided by the argument” (MacIntyre, 2009:13).

Notes:

ⁱ Aquinas infers from reason and faith that God creates (*Contra Gentiles*, I, Ch. 79, §2). However, it should be noted that this corollary has analogical content in the assignation that God is creator.

This position is arrived at as all linguistic representations may be understood as cognitive representations of particular entities observed or conceived of. In this sense, the symbol – although directing to the signified – is not the essence of the signified, but the construal of the particular thinking subject.

“... [T]hings are said of God and creatures analogically, and not in a purely equivocal nor in a purely univocal sense” (*Summa Theologica*, I, Q. 13, A. 5).

Now, although analogy is utilised for all cognitive representations, there is, for Aquinas, a difference in the content of the analogy when the Divine entity is compared to creatures. For whilst terms may be used with reference to creatures leading to comprehension of the content signified by the symbol, God is too far removed from the immanent experience of the subject to be totally adequated (*Summa Theologica*, I, Q. 13, A. 5). Indeed, the ontology of God exceeds “... the signification of the name” (I, Q. 13, A. 5).

ⁱⁱ “... [T]he act of being is the first effect, and this is evident by reason of the universal presence of this act” (Aquinas, *Contra Gentiles*, II, Ch. 21, §4).

And:

“... [A]mong all effects the most universal is being itself: and hence it must be the proper effect of the first and most universal cause, and that is God” (Aquinas, *Summa Theologica*, I, Q. 45, A. 5).

ⁱⁱⁱ Much of the argument presented in this chapter concerns causally contingent being upon God. It should be noted that Saint Thomas differentiated between contingent and necessary causality in the third of his five ways (*Summa Theologica*, I, Q. 2, A. 3).

“... [N]ot all beings are merely possible, but there must exist something the existence of which is necessary. But every necessary thing either has its necessity caused by another, or not. Now it is impossible to go on to infinity in necessary things which have their necessity caused by another... Therefore we cannot but postulate the existence of some being having of itself its own necessity, and not from another... This... [is] God” (I, Q. 2, A. 3).

As the citation demonstrates, in Aquinas’ estimation, entities that are causally necessary are not either uncaused or non-contingent upon God for their being (Brown, 1964:79-80). Thus, whilst Saint Thomas considers heavenly bodies to be necessary, they are also contingent in the sense that they are dependent upon God for their existence. What leads these beings to be called “necessary” in the first sense of being non-contingent – although in the second sense they are contingent as dependent upon God for their being – is that they are the necessary cause of other beings’ existence (Aristotle, *Metaphysics*, Book V, Ch. 5, Brown, 1964:81).

Our focus, of course, is contingency as explicated in this footnote in the second sense: all things that have being are causally dependent upon God for their existence (Aquinas, *Summa Theologica*, I, Q. 2, A. 3).

^{iv} According to Aquinas,

“... God creates things, from the fact that there can be nothing besides Himself that is not caused by Him... only He is the universal cause of being” (*Contra Gentiles*, II, Ch. 21, §3).

The extrapolation to God creating escapes circular argumentation in it emerging from the contingent dependence of other beings upon a non-material, primary cause, for their existence, as they cannot cause their own being:

“Other agents... are not the cause of the act of being as such, but of being this- of being a man or being white, for example” (*Contra Gentiles*, II, Ch. 21, §3).

Tautologically, the act of being presupposes the existence of being.

v Aquinas' God is not image-able in a substantial manner, but can rather only be identified by what God is not:

“... [A]s Aquinas... was want to observe, the knowledge of God provided by reason alone amounts to a form of agnostic theism: a warranted conviction that there is a God and equally unwarranted uncertainty as to his nature” (Haldane, 1996:164).

For Aquinas, it can reasonably be asserted that God exists from study of the existence of being and its emergence in the act of creation.

“... [A]mong all effects the most universal is being itself: and hence it must be the proper effect of the first and most universal cause, and that is God” (Aquinas, *Summa Theologica*, I, Q. 45, A. 5).

However, the theological task of ascribing the contents of the nature of God cannot be done via philosophical discourse.

“... Ambrose says... ‘It is impossible to know... [t]he mind fails, the voice is silent’... [M]an cannot obtain the knowledge of God by natural reason...” (*Summa Theologica*, I, Q. 32, A. 1).

This is the specific project of the reasoned ascent to faith than it is to the purely reasonable philosophical enterprise which can conjecture and approach but cannot make declarations of God's nature with certainty (Aquinas, 1996:46).

vi It is relevant to take note that Aquinas' argument does not impinge upon evolutionary acts within nature. Various, evolution may be understood as teleological, certainly in the sense that environmental pressures necessitate adaptations for the survival of species. Evolution is of course a process only possible after the creative event. Hence, the distinction between creation and evolution should be highlighted. Conceived in this manner, Aquinas' argument is compelling:

“Nature has no knowledge of the purpose for which it acts, nor does it view it in the light of an end, nor is it aware of the connection between the means and the end; so that it cannot propose an end to itself, nor more order or direct itself towards the end” (*De Potentia*, Q. III, A. 15).

vii Nichols argues that the earliest detection of Natural Theological activity dates from the fourth century AD in the work of Saint Ephrem the Syrian (2010:157). Ephrem wrote:

“... [T]he book of creation...
has in its narrative
made the Creator perceptible...
it has envisioned all His craftsmanship,
made manifest His works of art” (1990:108-109).

Saint Augustine also acknowledged that beings reveals the existence of God by virtue of their temporal nature (*Confessions*, XI, iv(6), [AD397-398]1955:190). Although earlier touched on, an item of surprise to many contemporary readers is the great father of Modern science, Isaac Newton's embracement of Natural Theology, too (Nichols, 2010:158). Indeed, in the *Principia*, Newton declared:

“This most beautiful system of the sun, planets, and comets, could only proceed from the counsel and dominion of an intelligent and powerful Being” (1846:504).

Akin to Newton, the astronomer Galileo also followed a Natural Theological position (Nichols, 2010:159). In his “Letter to the Grand Duchess Christina”, he proclaimed the path from nature to God:

“To prohibit... science would be no different than to reject hundreds of statements from the Holy Writ, which teach us how the glory and the greatness of the supreme God are marvellously seen in all of His works and by divine grace are read in the open book of the heavens” ([1615]2008:128).

viii The “New Atheists” proffer particularly antagonistic attitudes towards the contents of articles of faith and the institutional preservers of these articles. In the early part of this work Dawkins' approach was considered. Christopher Hitchens (1949 - 2011) was another proponent of the critique of faith. In terms of epistemic gains, Hitchens was particularly scathing of faith as being evidentially unjustifiable, as he professed with considerable sentiment:

“Religion has run out of justifications... it no longer offers an explanation of anything important. Where once it used to be able, by its total command of a worldview, to prevent the emergence of rivals, it can now only impede and retard—or try to turn back—the measurable advances that we have made... Meanwhile, confronted with undreamed-of vistas inside our own evolving cortex, in the farthest reaches of the known universe... religion offers either annihilation in the name of god, or else the false promise that... we shall be ‘saved’” (Hitchens, 2007:282-283).

^{ix} Carroll’s argument is founded in empirical science. However, there is a certainty apparent that does not properly belong in the tentative enterprise of “hard” science. Scientific theories should only be understood as provisional, as with greater evidence theories adapt or are falsified. Hence, while the emergence of further knowledge can be accorded from current scientific theories, absolute assurance should not be given. In terms of the history of the cosmos, Carroll states:

“Using the rules provided by general relativity, and some assumptions about the types of matter and energy that pervade the universe... [we can extrapolate] backwards in time to reconstruct the past history of our universe. Eventually – about 13.7 billion years ago, according to our best current estimates – we reach a moment of infinite density and spacetime curvature. This singularity is known as the ‘Big Bang’” (2011).

Indeed, Carroll’s account of the initial singularity is in accord with what is generally acceptable. However, this chronicle is only a statement of how things as they are came to be following the initial singularity. What remains ungrasped herein is the cause of the singularity. From a purely physicalist account, primary causality remains an untouched upon theme, and thus, the extrapolation that there is nothing outside the universe cannot be made.

An attempted reprieve against his argument’s weakness in its certainty, is given by Carroll when he makes appeal to the empirically unknown conditions prior to the initial singularity:

“... [I]t is... plausible that what we think of as the Big Bang is merely a phase in the history of the universe, which stretches long before that time – perhaps infinitely far in the past” (2011).

However, still no explanation of the ontology of the cosmos is provided outside of appeal to “hard” science. As has been posited, “hard” science cannot adequately clarify non-scientific questions.

^x The legacy of Hume and Kant is apparent in the Enlightenment philosophy that followed in their wake by rejecting transcendental knowledge which fuelled much of Modern thought. A reminder to the reader of some primary texts that demonstrate Hume and Kant’s positions are:

“If we take in our hand any volume—of divinity or school metaphysics, for instance—let us ask, Does it contain any abstract reasoning about quantity or number? No. Does it contain any experiential reasoning about matters of fact and existence? No. Then throw it in the fire, for it can contain nothing but sophistry and illusion” (Hume, [1748]2008:86).

“By means of sensibility, therefore, objects are given to us, and it alone furnishes us with intuitions; by the understanding they are thought, and from it arise conceptions” (Kant, [1787]2010:43).

^{xi} The Modern critique asserts:

“... [I]f the [human] mind is bounded by what it can know, and God is truly transcendent, then our conceptions of God... cannot bear on or be directed on God...” (MacDonald, 2009:xiii-xiv).

Aquinas, though, provides an even more ancient critique against knowledge of God as offered by the first century AD Dionysius the Areopagite (*Summa Theologica*, I, Q. 12, A. 1), who identified God as the unknowable:

“... [T]he unifying Source of all unity and a Super-Essential Essence, a Mind beyond the reach of mind and a Word beyond utterance, eluding Discourse, Intuition, Name, and every kind of being. It is the Universal Cause of existence

while Itself existing not, for It is beyond all Being..." (*The Divine Names*, Ch. 1, §1).

^{xii} Discussions in the third chapter of this work of "*scientia*" refer. The enterprise of "*scientia*" is the awareness of being that leads to knowledge of natural entities (for only what exists can be known) (Aquinas, *Commentary on the Posterior Analytics of Aristotle*, Book I, Part IV, Jenkins, 1997:18-19). In turn, knowledge of natural things permits enquiry surrounding the cause of particular being's existence (Aristotle, *Posterior Analytics*, Book I, Part II). Hence, "*scientia*" can be construed as an organised and reasoned pursuit of the truth of being, wherein truth entails the meeting point of the being of the thing as it is and the intellect as it understands (Aquinas, *Summa Theologica*, I, Q. 16, A. 2). Such knowledge remains for the human in an imperfect state because of the human's limitations upon knowing things as they are, but nevertheless, partly represents being to the thinking subject (Jenkins, 1997:32). The relationality in the engagement of the thinking subject with the perceived thing hints at another level of unity in addition to the ontological unity of any particular thing: the being of the subject meets the being of the thing in the bringing forth of truth as conformity between the two. Knowledge is therefore united in its existence, if it is true in accord with the Thomist conception thereof.

CHAPTER 7:

Conclusion

“Whereas positivism and scientism ‘refuse to admit the validity of forms of knowledge other than those of the positive sciences’, [we propose] another path, which calls for a synthesis between the responsible use of methods proper to the empirical sciences and other areas of knowledge such as philosophy, theology, as well as faith itself, which elevates us to the mystery transcending nature... Faith is not fearful of reason, on the contrary, it seeks and trusts reason... [because faith and reason] cannot contradict each other” (Pope Francis, 2013:181, §242).

7.1. Research context:

This piece of research finds its locale at the intersection of philosophical discourse and “hard” science. However, as could be expected due to its tentative nature, the research landscape of “hard” science was particularly changed in 2012 with the discovery of what came to be known in popular parlance as the “God particle”, that is, the Higgs boson at CERN in Switzerland. This massive finding added support to the realism asserted to in this work in opposition to subjectivist epistemology.

The Higgs field was first postulated approximately 50 years ago by particle physicists in an attempt at grasping the “... *mass generating mechanism*...” at the foundational level of material reality (Della Negra *et al.*, 2012:1560). Indeed, without this – then – hypothetical construct, the elementary particles that comprise the cosmos would have had no mass, such that the foundational quarks and electrons would have had to be akin to the photons that constitute light (Carroll, 2012b:5, Weinberg in Baggott, 2012:xv). The necessary discovery of the Higgs boson was thus one of the driving forces behind the development of the Large Hadron Collider (LHC) – starting operations in 2008 – at CERN, to foster an account for the ascription of mass to fundamental particles (Cho, 2012:1524, Della Negra *et al.*, 2012:1560, 1565). Cho explains what the Higgs theory inferred:

“Physicists assume[d] that empty space is filled with a ‘Higgs field,’ which is a bit like an electric field. Particles interact with the Higgs field to acquire energy, and, hence, mass... Just as an electric field consists of particles called photons, the Higgs field consists of Higgs bosons woven into the vacuum” (2012:1524).

Data analysis accumulated in 2011-2012 demonstrated to particle physicists the existence of a “Higgs-like boson”, a novel entity that conformed to the theory of the Higgs boson (The ATLAS Collaboration, 2012:1581-1582). Having a ~125 GeV mass, the Higgs-like boson puts forth evidence for a weakly charged, non-empty vacuum (Della Negra, 2012:1565, The ATLAS Collaboration, 2012:1582).

“The LHC has glimpsed a part of nature that had heretofore never been seen... This is something real” (Carroll, 2012b:4).

The Higgs boson provides explanation for how atoms and molecules came to exist with mass, for without mass the particles would be similar to photons, that is, always moving at light speed (Carroll, 2012b:5). The necessitation of the existence of the Higgs for the existence of particles with mass leads Carroll to the conclusion that the Higgs is a real entity, and by extension that the theoretical postulation about it is, at least tentatively, true.

However, with a leaning toward the Continental philosophical tradition, the author has found considerable postmodern disagreement to the suggestion that the extant has bearing upon knowledge in conformity with it, that is, with truth. In the realist understanding of science as we have defended throughout this work, and which is inherent in the stance adopted by Carroll and his fellow physical scientists, it is the purpose of “hard” science to model the way that things are, with grounding in preceding scientific theories.

Knowledge for the postmodern need not be reflective of being, for even empirically unsound theoretical postulations may be included within this model of knowledge.¹ Such is the critique against any form of dominant, “grand narrative”:

“... [M]odern... science... legitimates itself with reference to a metadiscourse... making an explicit appeal to some grand narrative... [But i]n... postmodern culture... the question of the legitimation of knowledge [arises]... The grand narrative has lost its credibility, regardless of what mode of unification it uses...” (Lyotard, [1979]1984:xxiii, 37).

¹ *“... [I]t is in discourse that power and knowledge are joined together. And for this very reason, we must conceive discourse as a series of discontinuous segments... [W]e must not imagine a world of discourse divided between accepted discourse and excluded discourse, or between the dominant discourses and the dominated one; but as a multiplicity of discursive elements that can come into play in various strategies... Discourses are tactical elements or blocks operating in the field of force relations; there can exist different and even contradictory discourses...”* (Foucault, [1976]2005:234-235).

The problem of the grand narrative of science for the postmodern – as further articulated by Deleuze – is the subjective appeal to more than can be asserted by the subject, that is, to the impossibility of anything being given to the thinking subject beyond itself (2001:86-87). Following the earlier articulated Kantian line of thought, Deleuze proposed that though there is extra-subjective reality, the thinking subject has only the manner in which objects appear to the subject at her grasp (2001:88). Indeed, for Deleuze, being is not contained in the subject's perceptions thereof (2001:88). Being may then be detached from epistemology in the postmodern conceptualisation (Pippin, 2005:189).

In the face of the extraordinary findings of cosmology and particle physics, are we reasonably to put forth that nature does not impinge upon human understandings? Despite the postmodern context, the position of this research work has consistently been quite to the contrary: scientific theories, as demonstrated by their efficacy, need to be held in esteem as tentative and partial models of being. To select a divergent epistemological route is tantamount to subjective solipsism, for there would be no correlation between signs and symbols, between theories and postulates or between different subjects' knowledge (Davidson, 2001:43, 46).

7.2. Summary of argument presented:

The research problem articulated at the start of this study sought to discover where or if – from within a philosophical approach – points of interaction between science and faith exist. This research attempted to take cognisance of the troubled nature of metaphysics in the post-Kantian philosophical setting. In this context, being should be accepted as inaccessible, which is a position that can further strengthen the scientific view that “hard” science is the sole interlocutor of valid knowledge. By extension, faith is denigrated to conjecture rather than sound knowledge.

In order to meet the research problem, the argument offered proceeded as follows:

Chapter 1: Introduction:

The first chapter set before the reader the current philosophical context of the science and religion dialogue. Herein, it was proposed that the opposing “forces” of religious creationism and scientific physicalism are both approaches that marginalise being by ignoring or reducing it. The argument was made that an ontological epistemology which seeks being-as-it-is was required to resituate being to the core of the encounter with

reality. However, to bring this about, appeal would have to be made both to “hard” science and metaphysics such that being could be represented in true knowledge. It was put forth that in returning to Thomistic primary texts, this contemporary problem of separating knowledge from being could be addressed, and in so doing Aquinas would be reclaimed as a scholar relevant to both contemporary scholarship and perennial being.

Chapter 2: Reclaiming the primacy of being in contemporary philosophy:

The reclamation of a Thomist ontological epistemology that contributed to the science and faith dialogue necessitated the development of stances contrary to those of some highly influential scholars. This was required as key themes in the work of Saint Thomas Aquinas have been laid aside, among these the ideas of philosophy, the possibility of metaphysical knowledge and of claims to truth, as well as the essential contention that faith has relevance to knowledge systems. To accomplish the retrieval of these – such that Thomism could be utilised in contemporary philosophical discourse – the author problematised and developed counter positions to those offered by Kant, Nietzsche, Heidegger, Dawkins and Hawking through textual analysis. In the opposing paradigm that was developed, being was returned to a position of philosophical centrality. Having recaptured being, truth – as being’s product developed in conjunction with the thinking subject – became epistemologically reachable once more.

Chapter 3: Thomist clarified realism: *scientiae* of being:

At a disjunction from being, anti-realist philosophical thought has been construed as irrelevant to the findings of “hard” science. To validate philosophy, the attempt had to be made to reconnect philosophy to “hard” science by permitting being – the “real” – to be, at the heart of the philosophical enterprise. This process was undertaken in the argument that provided for non-naïve realism. Continuing along a nuanced path of reasoning, scientific theories were also claimed to be tentative ontological models constructed by human activity. A direct consequence of the realist account was the emergence of the possibility that truth is obtainable. This is in line with the Thomist postulate of “*scientia*” wherein being and subject meet, provided that being is adequately represented in true statements. At this juncture, knowledge was expanded beyond the boundaries of physical and natural science. Thus, this paradigm proffered that reasonable faith – i.e. knowledge of the First Truth – also contributed towards “*scientia*”, provided that the latter holds knowledge of being.

Chapter 4: The boundaries of science:

As the “non-scientific” is readily discounted by positivistically-inspired scientism, the narrowness of scientific delineations of “science” was identified. Divergent from their claimed anti-metaphysical identities, both positivism and scientism, it was argued, are metaphysical positions in that both make claims concerning the nature of reality. In this regard, the postulate was defended that these “science-alone” theories transcend the findings of mere “hard” science. Far from reliance upon science as an absolute source of unfettered knowledge, the activity of science was construed as limited and bound. It was deemed as limited because science is informed by nature, cognition, and method. While Kant had put forth that science had no boundaries to its explanatory possibility, a counter position was argued for in this chapter ([1783]2007:62). The approach utilised was nevertheless Kantian in the sense that metaphysics was employed to demonstrate the bounded nature of “hard” science: for even in scientism there is no escape from metaphysics (Kant, [1781]2010:38). The foundational problem of metaphysics – that being is – was explored in relation particularly to the “problem of creation”, which was claimed to be an empirical unverifiable and non-testable quandary falling without the bounds of “hard” science. However, as a discipline with both “hard” scientific and metaphysical dimensions, cosmology was conceptualised as a particular point where boundaries between the two spheres of knowledge become porous. Where metaphysics was revealed to be of particular importance in cosmology was in the non-scientific problem of causality, for “hard” science was demonstrated as incapable of accounting for why being is.

Chapter 5: The “*scientia*” of creation:

Opening from the argued position that “hard” science cannot account for why anything is, this chapter developed a metaphysics for creation. In so doing, the act of creation was posited as the causal action behind the bringing into being of all things based upon evidence garnered from the requirement for causal explanation. The metaphysical argument postulated, had its source in the Thomistic understanding that the act of creation is not a change in material form, but is instead the bringing about of being from not-being; an act entirely unperformable by any contingent thing (Aquinas, *Contra Gentiles*, II, Ch. 17, §2). Indeed, it was argued that by its nature, the act of creation is totally transcendent of matter. Creation is thus a theme that falls without the bounds of “hard” science, contained – as it is – to explore only the material. However, that creation causes material entities, the study of matter via “hard” science – theoretical models thereof – impinges

upon these same entities' metaphysical accounts. Metaphysics must hence be in conformity with the product of creation – things – were it to have bearing upon the knowledge economy as true claims about being. It was as such that the metaphysics of creation developed, was a substantive reclamation of the tradition of Thomist natural philosophy, wherein philosophy and “hard” science contribute to develop “*scientia*”, i.e. knowledge of being.

Chapter 6: The unity of Truth: causal knowledge of contingent being:

As the preceding chapter articulated that there is a metaphysical “problem of creation”, the task that this chapter had to deal with was the construction of a responding metaphysical position. In other words, a particular explication of the primordial metaphysical problem had to be provided, with the requirement that it did not conflict in any way with the most robust, current “hard” science. The author proceeded to put forth that there was a point of encounter between metaphysical causality and “God”, such that God was construed as the cause of being. A defence of the Theist notion was thus given, that the act of creation belongs solely to God as a result of the identification that no caused thing can itself be the creator of being – i.e. matter, space and time – from a state of non-existence. Counter arguments against the Theistic perspective were provided. However, during the research, the causal nature of being continued to re-emerge – in each moment of existence of all things – such that a causal account had to be given. The view was argued that the most satisfactory account of being was that it was the end of a causing agent. Having established that both metaphysical and “hard” scientific accounts are necessary dimensions for full descriptions of being, it was argued that these unified accounts have their common source in the encounter of the thinking subject with being. In accordance, it was propositioned that knowledge held as reflective of being is both united in being and in true knowledge (“*scientia*”).

7.3. Findings:

Vigilant scrutiny of the research undertaken for this work, has revealed the following findings (directed to from within the preceding six chapters):

- Neither the physicalist acceptance of a self-causing cosmos, nor the subjectivist construal of all knowledge as the sole product of the human mind provide adequate explanation to the primordial metaphysical question of why there is something rather than nothing at all. Consequently, the Natural Philosophical stance argued for –

wherein a properly metaphysical solution to the metaphysical problem is given – has been strongly advocated for.

- The research has established that contemporary physical cosmology does not account for the cosmos' existence via the claimed self-causing ability of the cosmos, because no thing can bring itself into being from a state of not-being. Rather, thence, than any form of physical change in state as the explanation for being having existence, a metaphysical stance has been taken and argued for. Herein it was defended that the sole appeal we posit that can be made to account for the “problem of being” is for that problem to be reposed as the “problem of creation”.
- Creation, it was argued – following the exegesis of the Thomist argument – is the act of bringing forth being from not-being. We posit therefore that the Theistic appeal to a Divine Creator and the metaphysical argument that all things have being because of the act of non-physical, causal action bear striking resemblance. Herein, therefore we propose lies the most acute point of contact between science and faith: that is, in the theme of origins, present through cosmic history in the act of being undertaken by all things that have existence.
- However, the arguments presented have not sought to develop a “proof” for the existence of God. Instead, the position has been presented that holding the articles of faith that God exists and that God creates are reasoned and consistent choices following the cosmological and metaphysical arguments exposed and considered. This conclusion emerged after the development of the Thomist theory of “*scientia*”. Herein, truth – as the conformity between being and intellect – is construed to be held, containing both the theoretical postulates of “hard” science and metaphysical science, such that “*scientia*” may represent the knowledge of being in its myriad, non-reduced complexity (Aquinas, *Summa Theologica*, I, Q. 16, A. 2).

7.4. Contribution of study and its implications:

The unique contribution to the knowledge economy made by this study lies in the development of an epistemologically-founded metaphysics that contributes towards a method within which the findings of “hard” science relate to fundamental articles of religious faith. This emerges through the posing of metaphysical questions as a consequence of the being of particularities apprehended by “hard” science.

The Modern construction of science and faith led them to be imaged as mutually exclusive contraries as a consequence of the Kantian inability to access metaphysical knowledge

of the *Ding an sich* (Kant, [1787]2010:15). However, in the Thomist realist conceptualisation, science and faith are both epistemologies with access to being extra to the thinking subject. In the conceiving of truth as knowledge of being that emerges from the intellect of the thinking subject encountering being in its physical and metaphysical dimensions, knowledge is broadened to incorporate all dimensions of being.

Although “hard” science has been identified as limited by its nature throughout this work, we have theoretically extrapolated the activity of “hard” science as realist by nature, although of a clarified form. In the Thomist understanding, the subject is absolutely engaged in the constitution of scientific knowledge. Nevertheless, the balance with realism is attained in the position that partial access to the *Ding an sich* is gained, as demonstrated by the success of “hard” science. As such, the argument put forth by this research is that “hard” science transcends the Kantian critique when the theoretical postulations of science are knowledge of being. By this we mean that the knowledge held is a conformity between being-as-it-is and the mind of the thinking subject. This position is founded upon the ontological acceptance that knowledge of the thing can only be had because the thing has being apart from the knowledge that concerns it. As such, metaphysics is construed as more fundamental than epistemology.

It is thus that articles of faith – as strongly metaphysical – may be understood as coming into dialogue with the facts of “hard” science on every occasion that “hard” science considers things as they are, that is, as real entities with being. The subject and thing are in this manner united in being, overcoming the problems of modernity (i.e. scientific positivism [physicalism]) and anti-scientific, subjective postmodernity.

Apart from the impact which this study has for developing a methodology by which to relate science and faith – as cognitive models of being – a further contribution brought about is the relevance of Thomist ontological epistemology to a realist philosophy in the post-Kantian philosophical milieu. Confronted with a decided scepticism toward metaphysics, this research has seen metaphysics re-placed at the core of philosophy. This is because it has been argued that through sensation and cognition, the human thinker has access to being that was prior to the subject’s experience of being.

7.5. Limitations identified within the study:

Whilst providing a small contribution to broader knowledge, this study is not exhaustive and thus contains limitations. Among those identified by the author include paradigm limitations as well as areas of consequence as a result of the findings of the research.

In the first instance, the paradigm utilised to develop a typology – in truth, of being – for relating science to faith was that of Thomism. This is not the sole paradigm that could have been utilised to bring science and faith into dialogue with one another.² However, many more contemporary integrative approaches focus upon the faith experience of scientists as justification for the dialogue. In a more philosophical direction, the Thomistic utilisation of the epistemological limits of science and metaphysics brought out to the author a more timeless means through which to relate science and faith, transcendent of the limitations imposed by particular scientific findings upon metaphysics.

The second identifiable limitation of the study was the exposition of cosmology as an exemplar of a point of intersection between science and faith. It is true that there are other dimensions of contemporary science that illustrate the interaction. Among these evolutionary theory and quantum mechanics can be counted. As with all studies, this one had to be given manageable scope, and thus the choice for cosmology which, as already stated, the author deemed as the most fundamental meeting place between “hard” science and faith, given its primary concern with origins.

7.6. Identification of areas of further research:

The awareness of limits within this study directed the author to the delineation of further dimensions of potential research in the future. These are either the direct product of the ascertained limits or consequential problems from the study. Among these, the following were isolated:

² A study of current literature on the theme of science and religion reveals that there are in general four approaches to discussing the problem: conflict models, independence models, dialogue models and integrative models (Barbour, 2000:7). It should be acknowledged that the selection for the development of an integrative typology utilising Saint Thomas Aquinas’ philosophical theology is not a particularly contemporary approach, as there are current scholars that also assume a natural theological perspective, among these Polkinghorne (1988), Swinburne (1996) and Peacocke (2001).

In the first instance it would be pertinent to consider how Aquinas' thought relates to other philosophical problems, for instance, theories of perception, biomedical ethical issues, etc., in conjunct with contemporary "hard" science. This study has demonstrated that Aquinas developed a vast, but now largely neglected body of knowledge that can be tapped in attempts at solving current research problems.

Further, the exploration of Thomist epistemology lead to the identification of the problematisation of cognition in Aquinas' work. This is a theme that requires further extrapolation as well as expansion to bring it to relevance in contemporary philosophical discussion.

In the third instance, the science and religion dialogue appears to be dominated by theologians and "hard" scientists. There is further philosophical extrapolation in terms of the methodological relating of science to faith that remains to be done by philosophers such that the discussion becomes more than just matters of opinion but nuanced argument within a structured method.

The findings of the Large Hadron Collider at CERN in Switzerland brings the issue of cosmological beginnings touched on in this study to the fore. The points of intersection between the findings of this study and those of CERN need to be made in much greater detail, such that the philosophical attempt made herein can be kept at the pinnacle of the findings of "hard" science.

Moreover, as mentioned in the preceding section, there are other exemplars from present "hard" science that bring about occasions for the application of the methodological approach developed in this work. In particular, evolutionary theory – so often a point of contention in conventional misunderstandings of the relationship between science and faith – emerges as a potentially fruitful intersect between the two epistemologies. With the emphasis upon multi-modal approaches to truth as modelling of being, it appears likely that an approach toward evolutionary biology utilising the Thomist method would be enlightening.

7.7. Epilogue:

There is an adopted critical stance in some current philosophical circles towards the "traditional" philosophical concepts of being and truth. This is coupled with a populist move toward the scientific denigration of faith when confronted with "hard" science. We have

addressed these perspectives. Nevertheless, as core themes to the philosophical enterprise of Saint Thomas Aquinas, the reclamation of Thomist philosophy has been a complex task upon confrontation with these widely accepted positions. However, as a philosophical approach differing to dominant paradigms of discourse, this work is – in our opinion – timely.

It is our standpoint that in this research a well-reasoned and thorough position has been articulated with the end of the development of a clarified, realist natural philosophy within which to situate the dialogue between science and faith. Far from being an anachronistic historiographical reconstruction of mediaeval thought, this argument has been developed within the contemporary context of “hard” science with particular emphasis upon current cosmology as an exemplar to which the reclaimed Thomist theory of *scientia* has import.³ Because the realism that has been adopted in this work is clarified as opposed to naïve, however, the liberty has been permitted of highlighting metaphysics as a necessary aspect of knowledge. Herein, then, the claim to truth – as conformation between the thinking subject and the *Ding an sich* – is enabled to be reflective of being in its non-reduced intricacy, that is not solely explicable by appeal to either “hard” science or metaphysics.

In its essential form, the argument put forth has positioned science and faith as models of being, that is, of reality which is. This is not reality divided epistemologically, but acknowledged and accepted ontologically in its fullness. It has been argued, thus, that all paths to true knowledge relate primarily to the existing. There are, hence, points of contact between the epistemologies of science and faith when these model being.

Placed as a contribution to the dialogue between science and faith, this research work has furthered the partial elimination of the problem of interaction between these methodologically distinct spheres. By reconceptualising both “hard” science and reasonable faith within the Thomist construct of *scientia*, both perspectives are deemed as routes to adequation with being, that is to truth. As such, all knowledge posited that

³ The position defended from the work of Saint Thomas Aquinas has been that creation is not a material change but the bringing about of being (*Summa Theologica*, I, Q. 45, A. 2). We have thus proposed that as “hard” science has access only to the materially extant, the primordial bringing into being from not-being is not a matter for the theoretical appraisal of “hard” science. On the contrary, this metaphysical theme belongs, tautologically stated, specifically to the metaphysical sphere of knowledge. As a result, regardless of the further discoveries made by tentative “hard” science, the metaphysical problem that being requires explanation will remain as a philosophical question beyond the limits of the explanatory ability of “hard” science.

corresponds with being is a reflection, to some degree, of reality. Since science and faith offer theoretical constructions – models – on the being of the same reality, their epistemological content cannot be at variance if the proviso is fulfilled that the epistemic is informed by the ontological.

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