

In the Name of Science
The Variation of the Value of Science in its Relation with Theology through History

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One of the greatest thinkers of the history of philosophy and theology, using the most advanced geographical and meteorological science of his time, claimed that the Garden of Eden had a suitably nice, continuous, temperate, delicate, and fresh climate, and placed it in the Eastern parts of the world, someplace alongside the equator, most probably on the south side of it. Following Aristotelian science, this medieval thinker saw the Earth divided into five zones with different temperatures. The poles were the *zонаe frigidae* or cold zone. The zone along the equator delimited by the tropics was the *zона calida aut torrida* which was an extremely hot and inhabitable zone. While the zones between this last one and the poles were the *zонаe temperatae*. The kind of climate in the garden was a theological and philosophical conclusion due to the necessity of it being perfectly suitable for human life: clearly human beings flourish within a temperate and delicate climate. The location, on the other hand, followed the geography and climatology of the time. And the fact that no geographer had claimed to have found it was because the *zона calida aut torrida* was so hot that it was simply uninhabitable and intransitable. No human being could survive going through it. The philosopher-theologian was Thomas Aquinas.¹

I tell this story to picture a simple truth: science has been in dialogue with theology for several centuries now. Along the history of Western society, and helping to shape its values, science and the Christian religion had each played a preeminent part and made a lasting impression.

There is no need to argue for the value that contemporary empirical science has in our western society of the twenty-first century. There is no need to remark how much the knowledge of the world, its processes, the life present in it, and all the wonders of the rest of the universe has increased in the past two or three centuries, and in particular in the last one. Science does not only appear to offer humans uncountable and incredible knowledge of all these realities, but it also provides us with the capacity to control and

¹ *Summa Theologiae* I, 102, aa. 1-2.

dominate them. The magnificence of the electrical power of lightning, for example, was a natural force which caused many disasters and tragedies until the nature of its behaviour was mastered by Franklin in the eighteenth century. After several strikes had occurred to the bell tower of St. Mark's Cathedral in Venice along its history, in 1766 a lightning rod was fixed to it, and the monument was spared of the fearful encounters with such force of nature.² On the other hand, Christian religion and Christian theology, has fashioned significantly Western society in a way that few could try to deny.

True is, however, that the relation between science and theology along the history of Western Europe has changed radically: while in the thirteenth century natural science was regarded as a lower science, being theology the queen of sciences to which all the others were ordained, today it seems to be quite the opposite. Many historical, sociological, religious, and even political and economic reasons can be outlined for this shift. I will focus my discourse on the philosophical change which meant the dismissal of Aristotelian philosophy and the transformation of the world which this change involved. I do not want to be regarded as proposing a mono-causal thesis for this shift. As I just mentioned, there is a wide range of reasons to explain it. I find, however, that a philosophical approach to this problem is an appropriate path to follow as a first approximation to understand this shift.

I will succinctly present here three different episodes in the history of the relation of natural science and theology, separated each other by something like four centuries. Stephen Gaukroger has recently claimed that 'natural philosophy changes status from a marginal enterprise to one that forms the principal point of entry into our understanding of the world not with the seventeenth-century Scientific Revolution but in the thirteenth century'.³ Thus, I will start with Thomas Aquinas' use of natural science in his theology in the peak of the thirteenth century. In a second moment I will present some ideas of recent historical research on the rise of modern science in the seventeenth century, ideas mainly developed by Peter Harrison, Stephen Gaukrofer, and John Brooke, which focus on the role of theology for the development of modern science. Afterwards, I will come to the current century and look at one of the most prominent scientist-theologians, John Polkinghorne, and to acknowledge his perspective on how to relate science and theology. Finally, I will engage with some ideas offered by Rémi Brague in his *The Wisdom of the*

² Brooke 1991, 2.

³ Gaukroger 2006, 4

World, which will aid us to read the story that I am presenting through philosophical spectacles, obtaining a metaphysical analysis of the shift in the value of science in its relation to theology through their history.

It should be noted that, even though I believe that the insights presented in this short paper are valuable in their own terms, I also believe that it should be read more as a research programme. My comments on 'Thomas Aquinas' use of 'medieval natural science', the rise of modern science in the seventeenth century, or John Polkinghorne's theology in the context of science are short and, though not inaccurate, they can be imprecise due to the vastness of the topic I chose. Nevertheless, these three episodes represent vital points in history when the natural investigation of nature met theology. It is clear that without medieval thinking about the universe it would have been difficult to achieve something like modern science which played a decisive role in shaping our twenty-first-century world. Due to the length of this paper, I needed to leave some other episodes out of the discussion, such as the emergence of atheism in the eighteenth and nineteenth centuries, the Darwin episode in England and America in the nineteenth and twentieth centuries, or even today's problems concerning creationism and intelligent design. Evidently, these events would highly enrich the perspective taken in my investigation. I hope that future research in the area of science and theology does not only look into history or to current affairs on the topic, but look at both together, to learn about our present and to prepare us for future events.

Thomas Aquinas and the use of medieval natural science

Many historians of science warn us of trying to adopt a contemporary image of science and look through it to the early ages of the seventeenth century. Peter Harrison thus says: 'Many histories of science have tended to work backwards, beginning with the modern conception of the discipline of science, and projecting it back in time. Historians of science frequently concern themselves with 'an imaginary object'.⁴ Later on, he asserts emphatically that 'science', as we understand it, does not have a history which can be traced back beyond the seventeenth century.⁵ So the question which needs to be asked here is why do we deal with Thomas Aquinas if science as such did not exist in his time? What kind of insight can he provide to our discussion?

⁴ Harrison 1998, 8.

⁵ Harrison 1998, 9.

It is true that during the Middle Ages there was no science as such, as we understand of it nowadays. However, there was an analysis of nature which was certainly divided into two: the, strictly speaking, ‘philosophy of nature’, which dealt with the first principles of the natural and mobile reality (called *physics*); and a group of studies which dealt with particular kinds of mobile things in which empirical research was accentuated. These included studies on the heavens, on the parts of the animals, on the generation of animals, etc (this I will call henceforth ‘medieval natural science’).⁶ Clearly, the empirical research had been done long before by the great Philosopher, Aristotle. However, considerations on these topics were carried along during the times of Thomas Aquinas. It is true that these considerations were few and a-systematic, and because they were found within the greater umbrella of philosophy of nature, they were not well differentiated.⁷ Nevertheless, Thomas taught that ‘it is plain that the completion of science requires that one not stop at what is common but go on to the species’,⁸ meaning that the philosophy of nature should not stop in the physics but should go beyond and consider the different kinds of mobile beings, which required a somehow empirical study of them.⁹ This empirical study had been made by people better versed in them, long time before, and their investigations were taken as authority in the topics, that is why there was almost none empirical research during the Middle Ages, but a copying of previous texts which included these investigations with their conclusions.

Giving this lack of clarity in the distinction, it is difficult to find cases in which Thomas uses natural science to discuss his theology (instead of using natural philosophy). In fact, the typical case is the contrary: when he discusses the eternity of the world, or the Eucharistic transubstantiation, he clearly makes use of the principles of *physics* and not of his medieval natural science. There are, however, a few paradigmatic cases in his works which can give us some insight on how he understood the relation between the empirically-based studies of nature should relate to theology.

⁶ It should be noted, though, that the term science was not used for these activities, not even well into the modern times, and all of them were regarded as part of natural philosophy.

⁷ It is important to note, additionally, that these natural considerations were precarious and immature, and could not hold any objection from our contemporary science. See Beltrán 2009, 287.

⁸ *In I Meteor.*, l. I.

⁹ See Beltrán 2009, 284-285. Beltrán names a few titles which expand on this concept and explain the division of sciences during this period: E. Grant, ‘Science and Theology in the Middle Ages’, in Lindberg and Numbers (eds.), *God and Nature*, Berkeley – LA – London, Univ. of California Press, 1986; Ch. DeKoninck, ‘Introduction a l’étude de l’âme’, *Laval Théologique et Philosophique* III, 1 (1947); and others .

The first one we have already seen in the first paragraph of this text. Thomas decided the geographical location of the Garden of Eden, the existence of which was a theological conclusion, in some place in the globe. The existence of the Garden of Eden was concluded theologically, it was given by his understanding of Revelation. The location of it was decided according to his view of the natural world. Along his commentary of the *Hexameron*¹⁰ he makes use of the theory of the four elements to judge on the creation of the waters or the Ptolemaic theory to judge on the creation of the stars.¹¹

Nevertheless, a topic which is of extreme interest is the nature of the human embryo and its implications on theological matters such as the transmission of the original sin, the conception of Christ and Mary. Thomas accepts, almost without hesitation, Aristotle's biology. According to it, the human form (intellectual soul) requires an appropriately disposed matter to inform. This appropriate disposition is reached not at the moment of conception, but through some time in the development of the embryo. Thus, only after a previous development of the embryo is that it receives the human form (intellectual soul) and it can be called a human being. The second premise of this argument is of a clear empirical character.

Interestingly enough, due to his acceptance of the Aristotelian perspective, Thomas faces more troubles than his contemporary not Aristotelian theologians regarding the transmission of the original sin. A doctrine of an immediate animation (such as Augustine's or Cassiodorus) seems to accommodate better to the dogma of the transmission of the original sin. For this to be the case, they have to assume that the human soul immediately derives from the action of the parents and at the instant of conception the embryo is animated. However, given the current biology at the time, Thomas finds this position unacceptable and needs to go through a tougher path to solve this theological problem.¹²

In the case of the conception of Christ, Revelation was quite clear that as soon as the Holy Spirit announced it and Mary accepted, the Word was in her womb. Notably, it

¹⁰ *Summa Theologiae* I, qq. 67-70.

¹¹ Beltrán 2009, 291. For the next three examples on how Thomas deals with medieval natural science and theology, see as well Beltrán 2009.

¹² For the theological solution, I refer the reader to Thomas' *Summa Theologiae* I-II, q. 81, in which he explains that Adam's sin is transmitted to the whole of humanity as the action of a man is transmitted to his limb, given that the whole of humanity can be considered a unity inasmuch they share their nature.

is not of the dignity of the divine to unite to a matter which is not yet disposed for what it is to be. Again, given his Aristotelian heritage, Thomas finds more theological problems than his predecessors. The way to solve it in this case was to affirm the infinite power of the agent, i.e. the Holy Spirit, by which the matter in Mary's womb was immediately disposed to receive both the human soul and the divine nature.¹³

Finally, in the case of Mary's Immaculate Conception, which nowadays is a dogma of the Catholic Church, Thomas Aquinas explicitly declares on the contrary. Considering, again, the non-immediate animation of human beings, Mary could not have been conceived without original sin. It was a theological tenet that grace presupposes nature. Before animation, the embryo was not ready to receive the grace which would prevent the transmission of the original sin. Therefore, that particular grace was to be given at the moment of animation, which was after conception.¹⁴

It is quite evident that Thomas Aquinas conceived natural science to have some pertinence to the theological knowledge. Reason is capable of achieving truth autonomously, and scientific argumentation has a relative value for the theological enterprise. He did not use science, however, to confirm his theological views nor does he try to show any kind of concordist thesis between the two. Instead, he accepts the datum of natural science and from there moves on to do his theology. It is worth noting, however, that he does not do this in any theological topic. He uses science when a particular theological problem involves natural issues (as the location of a place or the development of the embryo). On other theological problems, such as the existence of God for example, he does use his reason to aid his theological understanding, but in a different capacity, that of metaphysics.

We might need to accept that Thomas had some times a too favourable opinion and excessive confidence on the science of his time. But this favourable opinion and confidence show how keen he was in using the most advanced of the knowledge of his time to pursue his theological mission. The result was a robust theological apparatus.

This optimism in reason, in its ability to reach truth, and in the unity of knowledge sprung from two models of understanding knowledge. As Gaukroger explains, these were the Aristotelian notion of *scientia*, in which the ultimate form of

¹³ See *Summa Theologiae* III, q. 33.

¹⁴ See *Summa Theologiae* III, q. 27, a. 2.

understanding of natural processes was one in which the essential principles underlying the behaviour of things were understood in a systematic way; and the Christian model which stated a rationally created universe *ex nihilo*, created by a single God, and only by grasping the rationale underlying creation was the one could reach knowledge of it.¹⁵ This medieval twofold model was mastered by Thomas Aquinas in his reconciliation of Aristotelian philosophy and Christian doctrine, and encourage scholars to pursue knowledge and learning in the sought of wisdom and happiness.¹⁶ We will see later that these two models got separated during the so called scientific revolution, which will bring several consequences to the relations between natural science and theology.

The Place of Theology in the Rise of Modern Science

In his groundbreaking work *Science and Religion: Some Historical Perspectives* of 1991, John H. Brooke taught what is possibly one of the most important lessons for anybody working within the science and religion debate: ‘Serious scholarship in the history of science has revealed so extraordinarily rich and complex a relationship between science and religion in the past that general theses are difficult to sustain. The real lesson turns out to be complexity’.¹⁷

Not only Brooke dismisses the account of conflict vs. dialogue, but proposes a vast list of ways in which science and theology related through the history of modern times: presupposition of theological notions as to advance in the knowledge of the natural world; sanction and justification of the rising scientific enterprise in the first centuries of the modern era; motivations for undertaking that new enterprise; regulation of the scientific methodology; constitution of such new scientific doctrines; finishing by leaving the door open to many other ways in which this relationship could be expressed.

I will analyse in particular the relation that the nascent science had with the long-standing theology during the sixteenth and seventeenth century in the forms of presupposition, motivation, and justification.

As the first way to find these relationships, Peter Harrison points to that of voluntarism, saying that ‘there is a long-established thesis that posits a connection

¹⁵ Gaukroger 2006, 455.

¹⁶ Gaukroger 2006, 7.

¹⁷ Brooke 1991, 5.

between theological voluntarism and the emergence of an empirical approach to the investigation of nature. On most versions of this argument, the late Middle Ages saw the development of a theological voluntarism that asserted the radical freedom of God's will. The Protestant reformers took up this view and served as the agents for its propagation in the modern period. Because, on the voluntarist view, God was not constrained by any prior rational considerations in his creation of the world, the argument goes, human minds cannot know *a priori*, through the exercise of reason alone, what specific order God will instantiate in the world. Instead recourse must be had to empirical investigation.¹⁸ For this reason, M. B. Foster, one of the first proponents of this thesis, back in 1937, concluded that 'the modern investigators of nature were the first to take seriously in their science the Christian doctrine that nature is created.'¹⁹ Now, if God's creative action is to be conceived in voluntarist terms, the element of contingency is essential to what he creates, given that by definition his activity exceeds determination by reason. But the contingent is only knowable through sensory experience. Foster then concludes: 'If, therefore, the contingent is essential to nature, experience must be indispensable to the science of nature.'

Harrison wants to move away from this explanation of the rise of modern science and moves towards a more historically based research. Thus he proposes two basic approaches during the seventeenth century which could explain the rise of modern science: the move towards literalism in the reading of Scripture provoked by the Protestant Reformation, which meant a more literalist reading of the Book of Nature; and the attempt to re-gain Adamic knowledge of nature, lost after the fall of the first parents.

Harrison describes the first move in his *The Bible, Protestantism, and the Rise of Modern Science* of 1998. It is well known the tale of the two books in which God communicates to the world: the Book of Scripture and the Book of Nature. Many authors through the Middle Ages and the Modern Era used this image to explain why the study of nature was valuable and what God had to tell humanity through nature.²⁰ However, Harrison marks a big shift in the passage to modernity regarding these two books. While during the Middle Ages both books, though particularly the book of nature,

¹⁸ Harrison 2007, 11-12.

¹⁹ Foster 1937, 453.

²⁰ Harrison 1998, 136-137.

were read allegorically, after the Reformation, they were read with a simple and straightforward literalism.

During the Middle Ages, natural objects (animals, plants, stars) had an allegorical meaning which taught truths about God and Salvation. Thus, the encyclopaedic enterprise of the period was a description of the natural life and what each individual had to tell about God. Their aim went beyond the description getting to that of elucidation. The world had an order and that order communicated a divinely inscribed meaning.

Nevertheless, this order and meaning was left behind during the Reformation. Atomist theory, which was gaining ground in the philosophical arena, emptied matter of meaning, by neglecting the notions of forms and natures. This, together with the assertion of the primacy of literal reading, entailed a new, non-symbolic conception of the nature of things, which led to, in biological natural explorations for example – called natural history at the time – taxonomies devoided of any symbolic theological value. In fact, the new literalist perspective in reading both the book of Nature and the book of Scripture, moved natural historians to a new approximation to the actual book of Nature in nature itself, what made possible new discoveries, showing that many of the symbolic interpretations of the animals in the Middle Ages were based on erroneous empirical observation.²¹ Basically, what was being stated was that the book of nature was a difficult book to read, and the symbolism with which the Middle Ages read it was, in a way, not the way in which it was written.²² Harrison concludes that ‘as an inevitable consequence of this way of reading texts nature would lose its meaning, and the vacuum created by this loss of intelligibility was gradually to be occupied by alternative accounts of the significance of natural things – those explorations which we regard as scientific.’²³ Because of their lost of meaning, natural things were no longer signs of the divine.

These facts, in the case of natural history turned the symbolic expressions of the Middle Ages into a language of taxonomic description, for example in the works of John Ray, and in the case of astronomy or physics – natural philosophy – Galileo famously expressed (together with many others, like Kepler, for example) that the Book of Nature was written in mathematical language. Thus, a theological perspective on how to read

²¹ Peter Harrison expresses this with the example of the pelican, asking: “‘How could the pelican represent Christ if, as Thomas Browne pointed out, it did not exhibit those behaviours on which the similitudes were based?’”, 1998, 91-92.

²² Harrison 1998, 167.

²³ Harrison 1998, 114.

Scripture, which was conceived in the times of the Reformation but which have some precedents in the philosophy of previous centuries (as I will try to show in the discussion of the last section), created a space in which what we know today as ‘science’ could start its development.

The second theological move which Harrison studied during the rise of modern science, and which created the impulse for it, were the discussions concerning the power of human reason to gain true knowledge of reality, considering the fallen state of human nature. He does so in his *The Fall of Man and the Foundations of Science* (2007), and he basically refers to the pursue of a new way of investigation of nature in order to re-gain the knowledge once lost due to Adam’s sin: ‘For many champions of the new learning in the seventeenth century the encyclopaedic knowledge of Adam was the benchmark against which their own aspirations were gauged.’²⁴

The main idea was that Adam was in possession of a perfect knowledge of nature, which implied that human minds had originally been designed to know the truth. Thus, if the impediments which arose due to the parental sin could be identified and neutralized, the mind would once again, of its own nature, arrive at truth or at least be better equipped to do so. That is why, Harrison affirms, ‘the differences between competing strategies for the advancement of knowledge put forward during the sixteenth and seventeenth centuries can be accounted for largely in terms of different assessments of the Fall and of its impact on the human mind.’²⁵ With this idea in mind, the ultimate goal was to determine the conditions under which knowledge would be possible at all, and what kind of things could be known at all.

Harrison, however, does not think that the theology of the Fall behind the new experimentalism of Bacon or the Royal Society,²⁶ for example, were part of a justification of their new methods. Instead, it was the recognition of the radically circumscribed nature of human knowledge that made possible the advances of modern science and its experimental approach to the study of nature. Experimentalism was justified by appeals to the fallibility of reason and the opacity of nature.²⁷

²⁴ Harrison 2007, 1.

²⁵ Harrison 2007, 3.

²⁶ In 1662, the Royal Society was formed, pursuing goals expressed by the apologist for the Society, Thomas Sprat, in terms of a regaining of the knowledge that Adam had once possessed. Harrison 2007, 2.

²⁷ Harrison 2007, 249-250.

Thus, the birth of modern science, with its empirical and experimental approach, was thus not necessitated because of the in-principle unpredictability of the divine will, as the voluntarist thesis might want to suggest. Rather the inconveniences and limitations of experimental natural philosophy are the inevitable outcome of realisation of the fallen condition of the human intellect: a consciousness of the manifold deficiencies of the intellect, of the misery of the human condition, and of the limited scope of scientific achievement.²⁸

Modern experimental science, as Harrison and many other scholars would put it, owes its origin in seventeenth-century theological discussions: on the method to read Scripture or in the theological implications of the Fall on the human intellect and its approach to reality to reach true knowledge. It seems clear that, along sixteenth and seventeenth century discussions, theology regarded the capacity of the human intellect to achieve true understanding of nature with not a great esteem. Natural philosophers were still, I understand, under the scope of the theological ruling knowledge, which dictated, in a way, the paths a new way of understanding nature should follow.

John Polkinghorne: Theology in the Context of Science

John Polkinghorne is one of many contributors to the contemporary debate between science and theology. Of these many, he considers himself within the group called ‘the scientists-theologians’. Although it is clear that there are many other voices speaking wisely today on topic related to this debate (Paul Davies, Ian Barbour, Nancey Murphy, Thomas Tracy, Philip Clayton, and many, many others), I have decided to choose Polkinghorne for many reasons. He has a long standing career as a scientist. His twenty five years as a physicist have provided him with a first-hand understanding of the labour of a scientist and a strong commitment to, and confidence in, the scientific enterprise as a whole. After these years he decided to start anew and turned into theology, without losing his love for science, which led him to be one of the most vibrant and devoted thinkers in the lively contemporary debate between his two disciplines. Finally, let this reflection on his thought be another small honour, in the year of his eightieth birthday, to his impressive dedication to science and theology.

²⁸ Harrison 2007, 258.

As a first step to considering Polkinghorne's thought, we should notice that his goal is to integrate the discourses of science and theology into a single account of the unity of knowledge, while conducting their discourse in the manner proper to their own intellectual needs.

Polkinghorne sees himself in the line of Augustine and Thomas Aquinas when affirming that theology needs to be put in the context of contemporary culture. Theology, he says, given that it seeks an account of all that it is, requires to take into consideration and to engage with the full range of human disciplines, from natural science to anthropology and sociology, to aesthetics and ethics, as to explore the many layered reality of our experience and to put it into the presence of God. Augustine was deeply influenced by the Neo-Platonism of his time, while Thomas Aquinas employed the rediscovered insights of Aristotle in framing the great systematic accounts of the *Summa Theologicae* and the *Summa Contra Gentiles*. Thus, he decides to do theology actively engaging with contemporary culture. He mentions two main currents of thought of today's culture: post-modernism and that which flows from the success of modern science. Although theology is buffered between these two, he chooses to engage with the second one, with science in itself, expressing a deep confidence that science is in the path of discovering reality, which in itself presents an opportunity to discover the ground of reality: the divine.

Polkinghorne has always thought that theology has to be somehow informed by science. From a consonance perspective, he moved into the idea that theology has to be done in a context of science. In the former perspective, science provides the ground for the edifice of theology. Science does not determine theology, but does constrain it. This idea goes along all Polkinghorne's thought, although it develops in the sense that from the idea that theology and science have to fit together in a mutually consistent way, in later years he started speaking of a theology in the context of science. By this he means a theology which is not only informed in specific cases on how the world works (as in the case of cosmology and creation, or divine agency and the laws of nature), but rather a theology which takes modern science as a source of more general insight, expressed through shaping a style of theological thinking.

One of the topics which has always been present in Polkinghorne's thought was that of divine action. Even when he proposes to use science as a theological resource,

and thus to do theology in the context of science, he continues to address this topic entirely. It is for this that I will present briefly the development of his thought on this topic, and will try to see how this development aligns with his theology in context.

I have divided Polkinghorne's thought on divine action into three consecutive stages. In the first one, he tries to explain how God can be seen to act in the created universe without interfering with created causes, and thus without acting as a created cause. In the second one, due to his exploration of *kenosis* theology, he accepts that God can be considered as acting as a created natural cause, while in the last one, he changes his language and considered that his ideas on this topic were to be regarded as 'thought experiments', even though science would still have a part to play in the theological thinking.

Polkinghorne's first stage (1988-2001) is informed, as the other two, by the developments of chaos theory. In this scientific depiction of complex systems, the universe is open to unpredictable (and indeterminate) future states. The key feature of this description is that it does not matter which option the system follows, for the energy is the same: the different possibilities are not discriminated from each other by energetic considerations.²⁹ This means that, given the principle of sufficient reason, new top-down organising causal principles must be at work in order to bring about the future by complementing and completing the energetic causality.³⁰ It is one of these new top-down organising causal principles that Polkinghorne assigns to God's activity in the form of input of active information. Thus, there is a flow of information from God to the universe by which God guides it providentially,³¹ and because the flow is only of information and not energy, God is not rendered to act as a created natural cause. God's action will always be hidden from science because it will be located 'within the cloudiness of unpredictable process',³² and will not be, therefore, 'demonstrable by experiment, though it may be discernible by faith.'³³

In his second stage (2000-2004), Polkinghorne still agrees with this account of divine action, though he changes his mind regarding the last conclusion: God could be thought to act as a created natural cause. As he explains, the idea that 'divine kenosis can

²⁹ Polkinghorne 2000, 112.

³⁰ Polkinghorne 2000, 121.

³¹ Polkinghorne 1991, 2.

³² Polkinghorne 2000, 150.

³³ Polkinghorne 1998b, 90.

then be understood as having four dimensions – relating to the self-limitation of divine power, of divine eternity, of divine knowledge, and of divine participation in the causal nexus of creation’, led him ‘to question the theological assumption that it is improper to consider divine providence as acting as a cause among causes.’³⁴ God is accordingly understood through the analysis of the notions of kenotic theology, not only as a cause among causes, but as a cause which causes even through energetic exchange of information. This is certainly a surprising statement, given that up until now Polkinghorne stated that God only acted through input of pure information without any exchange of energy, both to secure God’s distinctiveness and to affirm God’s spiritual character. We should remember that creatures act with exchange of information given their bodily existence.

Finally, in his third stage (2004 –), Polkinghorne continues to refer to his previous ideas as for understanding divine action in the created universe. However, it is noticeable a change in the attitude towards these ideas: ‘None of these attempted models should be taken with undue seriousness. They are what a physicist would call ‘thought experiments’ – attempts to explore and try out ideas in a simplified way, rather than purporting to be complete solutions to the problem of divine action’.³⁵ He is thinking especially on his account which explained God acting through the input of active information in chaotic systems. This stage is characterised by an acknowledgement of the provisional character of our scientific understanding of the universe, but also of the confidence on human power (expressed through modern science) to reach a real understanding of nature. In addition, he never stops expressing the conviction that God guides the universe providentially and that he does so not against but within the grain of natural processes. Thus, ‘a careful evaluation of what science has to say shows’ that given that ‘physics has not established the causal closure of the world’ it cannot ‘be used to deny the possibility of divine providential agency.’³⁶ Hence, he claims that ‘God acts through something like a constant persuasive re-directing’.³⁷ Polkinghorne shows that science has not finished its quest of understanding and explaining the world. What has been done so far provides for an open account of the universe. Given this open nature of the universe, it is possible to argue for a God who interacts within it. Somehow, he

³⁴ Polkinghorne 2001b, xii.

³⁵ Polkinghorne 2008, 78. Polkinghorne expressed a similar idea in 2001a, although at this stage the ‘thought experiment’ approach was not fully developed. See Polkinghorne 2001a, 190.

³⁶ Polkinghorne 2007, 95.

³⁷ Polkinghorne 2006, 139.

conceives God's action as directed at the universe as a whole, while through top-down causality a particular subsystem of the universe can be indirectly affected by that action.³⁸

The change throughout these three stages is clear, and I believe it to be Polkinghorne's own coherence which makes him go that path. In fact, it is the move from the 'topic-approach' to the 'contextual-approach' that we can perceive in this development. He says that 'there has been a tendency to think of theology's relationship with science simply in terms of wrestling with specific issues and problems, rather than in the general terms that would recognise the scientific context as affording also an opportunity to make use of an intellectual style of thinking of a more widely insightful kind.'³⁹ I see in his third stage that use of science, of the scientific way of thinking, to think theology. Theology still remains theology, of course. Nevertheless, theology as a whole brings into its discourse ideas and developments from the scientific view of the world, such as the openness of complex systems in the case of the divine action topic.

An Interpretative Discussion

What do these three case studies tell us about our original question? How does the relation between science and theology vary throughout history? Is there any teaching which could be drawn from these testimonies? Clearly, they are separated by almost four centuries from each other: Thomas Aquinas wrote in the thirteenth century, the Scientific Revolution (if there was such a thing) happened in the seventeenth century, and John Polkinghorne is still writing during the twenty-first century. Can we compare these cases, or explain the shifts in their way of joining theology and science? Who values who is the ultimate question that lies behind this paper: theology gives value to science or the other way round?

Rémi Brague explains that 'what is 'valuable', is what one esteems, what 'has a price', is what one prizes, what one appreciates. The principle that sets forth values must therefore be worth more than the values it sets down, which are by that fact always revocable.'⁴⁰ I want to argue that these stories I have told do have something to tell us if we look at the philosophy behind them, and that it is this philosophy which will reveal who values who.

³⁸ Smedes 2004, 55.

³⁹ Polkinghorne 2008, 5.

⁴⁰ Brague 2003, 119.

Thomas Aquinas was able to make use of the science of his time, with all the caveats that this characterisation involves, because he had a view of the world as intrinsically ordered. This view, as many have taught, derives from both his Aristotelian option in philosophy and his strong affirmation of the Christian doctrine of creation out of nothing. According to the first one, things in the world were units, or substances, of a certain kind because of their own metaphysical composition. Each thing, in an Aristotelian perspective, was one thing because of its material and formal co-principles. These co-principles determined the nature of a thing and thus its kind of activity. Thus, the unity of being and the kind of activity of each thing came from, let's say, within each thing: from its metaphysical constitution of matter and form. As a small corollary I should say that natural things act according to a certain necessity which follows from their nature, which implies a natural tendency to produce an effect.

The Christian doctrine of creation, on the other hand, gave Thomas the way to explain where these natures came from. In a purely Greek Aristotelian world, before Christianity for example, natures were eternal: they do not come from anywhere simply because they have always been there. This statement could not be accepted within a Christian world-view, a fact which allowed Neo-Platonic-influenced philosophies to be predominant for the first millennia or so of Christianity. Thomas Aquinas, however, decisively combined the Aristotelian conviction of the existence of intrinsic natures together with elements from the Neo-Platonic metaphysics of participation to provide a strong and fruitful synthesis in his own metaphysics of creation. God, in creation, puts into existence natural things with their own natures to act. Not only the existence of things and their modes or kinds of beings, but also their powers and their ways of operating with those powers, simply because if the principle of action – nature – is given, then everything which comes from that principle is also given. And it is given because it pre-exists in the perfectly complete being of God, what has been known as exemplarism. With his description of creation, Thomas gives a complete account of how and why things are, and how and why they work as they do. In this perspective God is completely distinct from creation, being at the same time immanent to it, and creation is utterly dependent upon God. Thus, this philosophical (Aristotelian-Neo-Platonic) stance which affirms God's universal influence and God's most intimately presence in each thing allows for the allegorical reading of natural things so common among medieval scholars: the medieval allegorical method of reading the book of nature relied upon an exemplarist metaphysics: so that insofar as earthy 'kinds' represented some higher reality, it was

required that they have some kind of essence which provided the basic of the link/representation. Nature was, somehow, God's autobiographical text. Thus, with this view of the world it was almost necessary that whichever the knowledge of the world was, in so far as it was true knowledge, it was welcomed to inform theological discussions, as it was in the case of Thomas Aquinas. The world in itself had such a unity that knowledge of it would only be accounted as valuable knowledge insofar as it represented that unity.

This image of the world did not remain for long time, mainly due to the tension in which it lived: the Aristotelian natures, if truly Aristotelian, it seemed that they needed to be eternal – at least in the very mind of God – which seemingly endangered God's omnipotence and free will. Thomas' synthesis did not appear to be enough as to relieve this tension, and new perspectives in theology and the understanding of the world appeared in the following centuries. Thus, it was with the incipient nominalism of William of Ockham that this medieval view of the world was started to be left behind. According to nominalism, there were no true natures of things which were shared by many, as in the Aristotelian view of things. Instead, in order to prevent any dangers to God's omnipotence and free will, the individual character of each created thing was accentuated. This entailed that exemplarism was certainly denied, and thus the allegorical method of reading nature was progressively left behind. In the following centuries, meaning was given to things, but, given that there were no natures which dictated this meaning, the interpreter could feel free to specify its content according to the spiritual needs of the occasion. There was no particular meaning which was given exclusively, until finally, close to the seventeenth century, no meaning at all was symbolic. Thus, in a way, as Louis Dupré points out, 'nominalism prepared the scientific revolution'.⁴¹

With nominalism's rejection of natures, the ideas of forms as metaphysical co-principle of the composition of things and of the tendential activity (their natural tendency to act in a particular manner) were as well dismissed. Thus, things did not have any more a principle of unity and activity (their natural and created form), which also denied any intrinsic capacity or tendency. This metaphysical environment clearly provided a more congenial space for the blossom of a corpuscular natural philosophy, which on its own right denied natures and essences, and implied, ironically, a seemingly more necessary intervention of God in the world in comparison to that of the medieval,

⁴¹ Dupré 1993, 41.

or may be better Thomist, metaphysics of creation. The corpuscular natural philosophy was a new understanding of material things which rejected any internal causal power, tendency or capacity of bodies, transforming the world into an inanimate, powerless, and a-causal conjunction of bodies. All these characteristics were no longer intrinsic to things, as in the Aristotelian model of the world, but were imposed from outside, from above, by the divine creator, thus inflicting upon creation laws of nature which would be observed by the mechanisms made out of the corpuscles, and which will show the goals God has for each thing.⁴² Thus, the internal tendencies to act, which came from the form of things in the medieval world, were relegated to external impositions of the divine.⁴³ Thus God was started to be seen as the universal designer and author of nature, which by his wisdom ordains and devises the totality of things.

Thus, the corpuscular natural philosophy, together with mechanical explanations, motivated by previous moves in the notions of God's relation to the world, his free will and omnipotence due to nominalists' appreciations of the natural world, which by their own caused a change in the way of the theological gaze of the world, and by considerations of the fallen status of the human capacity to know reality, stimulated the study of nature in an empirical new way. Gaukroger points out that what gave the new study of nature such an attractive character was 'the prospects it offered for the renewal of natural theology.'⁴⁴ In a way, Aristotle was no longer ruling natural philosophy. Christianity was once and for all taking over this discipline, as it had done with metaphysics and natural theology before.

Nevertheless, this very mechanical-corpuscular philosophy was favouring pure materialism, especially in France, and this danger was seen during the seventeenth century.⁴⁵ As to avoid this, Boyle speaks, in England, against the tendency to reason from the absence of perceived ends to the absence of ends altogether.⁴⁶ It was during the eighteenth century that this tendency of materialism was to be fully adopted. As Brooke points out 'the reconstruction of nature through mechanical metaphors has also been seen as a crucial step in the secularization of knowledge; for, if nature ran like clock-work, what room was there for God's direct activity or special providence?' Although the

⁴² Osler 1996, 402.

⁴³ Henry 2010, 76.

⁴⁴ Gaukroger 2006, 23.

⁴⁵ Gaukroger 2006, 27.

⁴⁶ Osler 1996, 400.

image of a clock-work universe was used in seventeenth-century England apologetically, ironically, it was during the eighteenth century that the same image was used by the deist in their attacks to the established religion.⁴⁷ Harrison adds an element which creates a higher tension in the relation between the incipient modern empirical science (based on mechanical philosophy) and theology: that between the rational principle of design and the more fragile historical concept of the Fall. With the rise of historical criticism during the nineteenth century, together with the fact that during the eighteenth century human cognitive incapacities began to lose the moral disapprobation that they had once attracted on account of their association with the Fall, that struggle was resolved in favour of the former.

The particular fact that human capacity to gain true knowledge of the world was started to be regarded as positive and powerful gives Gaukroger the basis were to build his main thesis: all cognitive values are gradually assimilated during the modern era to that of the scientific cognitive values.⁴⁸ The reliance on God to guide each step of natural processes was not a satisfying response to natural philosophers of the modern era who preferred to seek mechanistic explanations and keep God, more and more, at a distance. This is epitomised by Lord Kelvin who, in his *Baltimore Lectures on Molecular Dynamics and the Wave Theory of Light* of 1904, claims that ‘I never satisfy myself until I can make a mechanical model of a thing. If I can make a mechanical model I can understand it. As long as I cannot make a mechanical model all the way through I cannot understand.’ Mechanics, traditionally excluded from natural philosophy in the Aristotelian sense, is transformed not only into a natural-philosophical discipline, but into what was in many respects the natural-philosophical discipline *par excellence*.⁴⁹

Thus, even though modern science is certainly motivated and even justified by religious beliefs and theological considerations, given the metaphysical background that covered the intellectual environment of the modern era, a corpuscular-mechanical philosophy, its relation to theology shifted from that one being given value by theology, to that one who denied any value to theology, simply because, as Gaukroger would put it, theology does not model to the scientific cognitive values. Brague goes as far as to admit that it is in Nietzsche when this idea gains its extreme formulation with the severe rejection of the ancient and medieval notion of *kosmos*. The universe is no longer an

⁴⁷ Brooke 1991, 13.

⁴⁸ Gaukroger 2006, 3.

⁴⁹ Gaukroger 2006, 7.

organism or a mechanism, for it is neither alive nor it has a purpose.⁵⁰ If *telos* and *lanfulness* were given from above, if they were extrinsic to things in themselves, when theology can no longer accommodate the cognitive values of modern science, then this laws and goals are simply no longer there, and the giver of those is no longer necessary. Thus, Nietzsche made the mad man shout, God is dead.

It is against this image of the world that Polkinghorne, among many others, reacts. Polkinghorne wants to bring back a theology of nature, and a natural theology, to the realm of the valid knowledge of reality, and wants to put this kind of knowledge within the context of contemporary scientific knowledge. In a way, he wants to move away from Gaukroger's sentence of Western society ruled by the cognitive values of science. Thus, he mentions that science and theology are at the opposite ends of a wide spectrum of human enquiry about the world and its existence: 'at the scientific end is the realm of impersonal experience; at the theological end is the realm of the experience of the transpersonal. In between lie the realms of human personal encounter with reality, which are the subjects of disciplines such as aesthetics and ethics. The whole spectrum of enquiry makes up the rich many-stranded texture of human knowledge, surveying the encounter with the multi-levelled reality of the one world of human experience.'⁵¹

Clearly, Polkinghorne is trying to escape from the univocal vision of knowledge, to which Gaukroger shows Western society moved with the development of modern science through the seventeenth to the twentieth centuries. Thus, he explains that 'all these insightful disciplines must find their mutual reconciliation and integration with each other' and that 'the discussion of the interaction of science and theology is but a part of that single search for unified understanding.'⁵²

A few questions, however, arise when we consider this approach to knowledge and Polkinghorne's latest exposition of how theology should be made within a context of science. It is certainly admirable that the goal is to embed theology within the cultural framework of contemporary science. In this way Polkinghorne is undoubtedly following the paths of Thomas Aquinas, as he asserts. However, his goal goes beyond the Thomistic way of accounting for science in his theology. When he speaks of a theology

⁵⁰ Brague 2003, 190.

⁵¹ Polkinghorne 1998b, 128.

⁵² Polkinghorne 1998b, 128. Polkinghorne is not very explicit regarding his philosophical commitments, and he is still in the process of writing his thought, for what I will limit myself to an analysis of a few passages of his work.

in the context of science he explains that in the same way in which theology is made in the context of other cultural expressions, theology should be constructed in its contextually alongside science: ‘The past fifty years have seen the growth and flourishing of what have come to be called contextual theologies. The particular experiences and challenges that arise in a specific setting – whether its character is social and cultural (feminist insights; the liberation insights of the poor; and so on), or geographical and cultural (South-East Asia; Africa; and so on) – came to be recognised as providing new and stimulating ways of shaping theological thought... these contextual developments have largely been welcomed, and their reception by the theological community has been positive.’⁵³ He goes on to claim that up to now, theology is not done in this way when it is related to science. The way theology deals with science is solely through topic-discussions.

Thus he suggests that in order to do theology in the context of science, ‘the style of thought naturally associated [to it]... has the character of what I have called bottom-up thinking. It seeks to evaluate the evidential particularities of experience before attempting to move to the formulation of wider forms of understanding... Often it is only the stubborn character of the reality actually encountered that is able to mould adequately the shape of our thought. Quite frequently it is found that modes of thinking are required which are counterintuitive in terms of prior rational expectation. The paradigm example from physics is the idiosyncratic nature of the subatomic quantum world.’⁵⁴ Finally he comments that he believes that ‘too many theologians fail to treat what science has to offer with the appropriate degree of seriousness that would enable them to acknowledge adequately its contextual role’.⁵⁵

In a way Polkinghorne seems to be giving up to the cognitive values of modern science, demanding theologians to take science into much serious consideration when doing their theology. It seems, in a first approximation, that Polkinghorne’s first career as a physicist overtakes his second one as a theologian, claiming his theology to have somehow a scientific standard. However, on the contrary, he shows how this reading of his scientifically contextual theology could be misleading, given that he concludes his work of 2008 with a postscript in which he explains how science and theology are

⁵³ Polkinghorne 2008, xi.

⁵⁴ Polkinghorne 2008, xii.

⁵⁵ Polkinghorne 2008, 5.

included within a context of understanding much broader than themselves: that of the rational pursuit of truth.⁵⁶ In this perspective, then, it would not be science who values the discourse of theology, nor vice versa. Both intellectual activities seem to be included within this broader context and both intellectual activities should inform each other in order to elevate each other in their pursuit of truth.

Thus, a sort of equilibrium seems to have been reached in the history of the relations between science and theology: it is not theology that which gives value to science, as it might have happened in the Middle Ages or during the rise of modern science in the seventeenth century, nor it is science which gives value to theology, as it appears to be the case during the nineteenth and twentieth century discussions. It seems that both activities are valuable inasmuch as they are rationally seeking truth. The question, however, still remains: who decides over that truth?

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⁵⁶ Polkinghorne 2008b, 110.

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