



Wilton Park

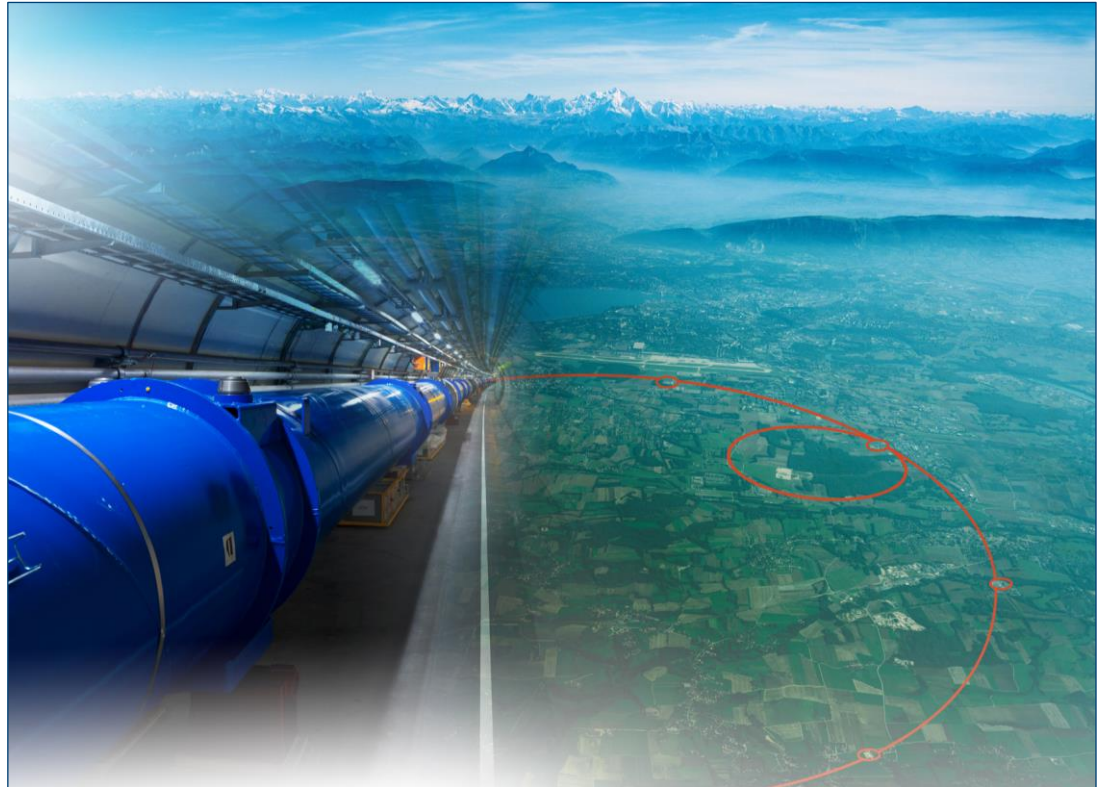


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Report

**The Big Bang and the interfaces of knowledge:  
towards a common understanding of Logic?**

Monday 9 – Wednesday 11 November 2015 | WP1433

Held at Chateau de Lucens, Lucens, Switzerland

In partnership with:





## Report

# The Big Bang and the interface of knowledge: towards a common understanding of Logic?

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In 2012 and 2014 CERN and Wilton Park hosted pioneering international conferences on the 'Big Bang and the Interface of Knowledge', broadening the dialogue between scientists, philosophers and theologians. The first of the conferences focused on aspects of searching for a common language, while the second conference was directed towards a common understanding of truth.

The discussions have shown that, although it is possible to access a measure of common understanding, words like logic have divergent meanings. The conferences have illustrated that the interfaces of knowledge are complex and subtle. Scientists, philosophers and theologians need to continue working hard at understanding what other disciplines are saying in their own terms, and this third meeting will focus on broadening this dialogue, using the themes of a common understanding of logic to do so.

### Key Explorations

- The use of Logic as a methodology;
- The plurality of logics? Paradoxes are defined by the logic of a given field; the notion of meta logic, translating one logic into the other for a constructive dialogue;
- The importance of understanding the other as you understand yourself;
- Identifying spirituality as a commonality between Science and Religion;
- The necessary conditions for maintaining and extending the conversation.

### The Greek 'Logos': a common meaning in ancient, Christian and modern language

1. First and foremost, what is logic? This is an important question that needs to be answered before the idea of a common understanding can begin to be unpicked. A term that has been around for over 3000 years, logic has a history in theology, philosophy, and science.
2. Given that the spread of scientific knowledge and technological advancement has contributed to there being a breadth of knowledge amongst these three disciplines, it may also stand to reason that scientific and technological advancement can help determine the various elements of logic. Is logic a static concept? Do different disciplines employ logic in the same way? How is logic formulated?
3. With the use of a 'framework of logic' it may be possible to gain a greater

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understanding of how conclusions are being drawn. Greek pre-Socratic philosopher Heraclitus maintained that people follow the common logos but acknowledged that there is an individual logical basis to each person. Heraclitus's common logos is all-encompassing and represents the cosmos, all its inhabitants, formulations, interactions and functions in the world. According to Heraclitus despite the inevitability of logos, humans may not be able to understand it, living through their own constructed interpretation.

4. Individuals use logic to construct meaning, a logical sentence structure, a logical way of communicating, ultimately forming a common, logical understanding of interaction. This logic formulates a type of order from which it is possible to identify unifying factors and patterns of behaviours that encourage commonality. This poses the question of whether order is a preposition of logic or a consequence of it, the answer to which is very important in contrast to the notion of chaos.
5. Aristotle asserted that in order to understand something, one must understand the very subject's cause and posited there being four types of cause; the material cause; the formal cause; the efficient cause; and the final cause. However, one of the current philosophical approaches to cause (since Hume) recognised as problematic to define, the principle of classical determinism, identifies only one possible cause of events: the past determines the future and is the sole principle of cause and effect with regard to physical science.
6. It is impossible to provide an explanation as to the cause of the Big Bang within classical determinism. The concept of time did not exist before the occurrence of the Big Bang; consequently there is no past in which to determine the future. Does there need to be a broader construction of the cause and effect principle in order to be able to explain the cause of the Big Bang? Or do we need to change the way we think about physical science?
7. Instead of asking about the possible causes of the Big Bang perhaps it would be beneficial to ask about the cause of the universe itself. However despite being a logically justifiable question within religious circles, to those in the field of physics the cause of the universe may not represent a logically defined question. Logic can encompass different characteristics within different contexts. This difference in perspective highlights the need for there to be an enlarged framework of logic.
8. Aristotle's classification of a subject's cause, in order to understand the subject itself, can be applied to the question of cause of absolute truth. Does logic need to be constructed to play a part in this definition? Can truths therefore be formed on the basis of logic?
9. Having identified the importance of understanding logic, and its various applications, it is also important to acknowledge what is illogical. The illogical is often explained through 'limit' events, testing events such as social pain, loss and tragedy that test the boundaries of definable meaning in life. For Christians, the life of Jesus Christ highlights the ability to find logic in the illogical through his own sacrifice and his love for all. Logos therefore also has meaning in love.
10. The type of logic personified by Jesus Christ can unify everyone. Logos as revealed in the person of Jesus Christ is God. The entity of unifying logos is identified with unity and love. Consequently, God transcends the human logistic and is a trinity of hypostases; what may be illogical to the human mind does not mean that it is not possibly true.

### **The logical divide: the differences between the inherent 'logics of science', and the inherent 'logics of faith'**

11. In the Christian faith the Doctrines present a formal set of beliefs, including a doctrine of creation which stipulates that God created the world. Given this explanation of the

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beginning, Christians are interested in how science interprets the beginning of the universe. Being based both in mathematics and in logic, science has provided answers to a number of questions regarding the makeup of our universe. There are however also instruments of faith, such as reason, tradition, and scripture.

12. The Big Bang and the creation of the universe invoke a plethora of questions and indeed can be construed as a source of contention between the separate disciplines. A ‘Barthian’ Theology separates science and religion, and declares that the science of the Big Bang has no real relevance within theological discussions of God, as God’s being is entirely explained through revelation. It is equally possible to assert, as Process Theologians do, that God is a part of the process. Scientific description offers insights into uncovering further knowledge about God within the process of the Big Bang and the creation of the universe, and indeed what comes next.
13. Both science and religion can agree that singularity is of mutual interest, as is the question of what happened before the Big Bang. For science, it may be illogical to presume that something can be created from nothing, without prior cause. However for theologians, the concept of something occurring out of nothingness is more palatable, allowing faith to fill the void of unknown territory that science can inherently not explain.
14. Roger Penrose has put forward the ‘Cycle of Time’ theory to explain the conception of time and space. He stipulates that the universe exists in a cyclic, iterated, timeline. The notion of singularity at the Big Bang is explained as being caused by another episode of iteration. As the universe expands its temperature cools. When the temperature of the universe reduces below that of its black holes, according to the second law of thermodynamics, black holes will start to release their stores of energy and ‘pop’. Within the theory of the ‘Cycle of Time’, it is this release of energy that creates the Big Bang of the subsequent universe.
15. With this scientific logic it would appear that there is less of a void for faith to fill. However the assumption that faith has a language of logic should not impose binary restrictions on it. Individuals engage with faith on a number of different levels giving religion a personal element, for which one version of logic may not be plausible. A notion of logic more suited to faith should involve paradox, anti-logic and diversity in unity.
16. Is it not worth asking whether it is possible for both the scientific and the theological understanding of the Big Bang to be mutually inclusive? Does evidence for one logic reduce the scope of the other logic? Or can the more we learn about one further our understanding of the other? In this case, the more we learn about science, the more we learn about faith, and their corresponding logics.
17. Logical positions have been defined in a socially constructive way. Something that is socially deemed to be logical can be seen in hindsight to be a post hoc justification of current opinions, with paradoxes running contrary to these opinions. In a socially-constructed logic, paradoxes do not necessarily equate to being illogical. Furthermore, something that is deemed to be illogical, and has been for a long period of time, can become logical. It was once thought that the Earth was at the centre of the universe, and that the sun, stars and planets revolved around the Earth. Any alternative explanation was deemed illogical (on the evidence of no perceived motion, no observed stellar parallax, etc). Over time as new evidence came to light (but, essentially, only partial evidence) the illogical heliocentric alternative, became the logical statement. Paradox is only contrary for the moment.
18. As a result of the varying constructions of logic, both inter and intra disciplinary, propositional and social, scientific and theological, it can be difficult to form a dialogue between the variations. In order to make progress when divisions arise there needs to be a clarity of definition and relation. Philosophy may be a key contributor to that solution.

“Ultimately, how one describes the world will depend on how one looks at the world.”

## What does philosophy understand by logic?

19. Aristotle's work on logic can be used to provide a common starting point for the logical basis of both science and religion. For Aristotle, it was necessary to understand the cause of something in order to understand the phenomenon itself. This also holds with regards to Aristotle's view of scientific knowledge, which involves deductive inference and first principles. First principles are instances that cannot be presupposed by another.
20. The idea that human, and indeed scientific, knowledge was beneficial to religion also derives from Aristotle's formulation of logic; Anselm used the same principles to demonstrate the existence of God. It was Kant however in the 18th Century that objected to this ontological argument. According to Kant existence is not a predicate, that is, the part of a sentence which provides information about the subject of the sentence. It is difficult to pin existence as a property. It is possible to say God does exist, and that God does not exist, with both 'does' and 'does not' acting as the predicate. The existence of God cannot be explicitly proven using ontological means, but instead can represent personal belief. This would therefore imply that there may indeed be different logical basis for the disciplines.
21. Whether or not the two logics are incompatible is open to interpretation and has been the subject of debate from the period of Enlightenment. However it may be more insightful to look at the outputs that have derived from the knowledge of faith and science, rather than judge them on their, perhaps outdated, formulations of logic.
22. Is it possible to stipulate that logic cannot be translated into generic terms? Is it paradoxical to use logic in a plural sense? A central definition of logic would imply that it could withstand being topic neutral. Perhaps what is instead being employed is a series of divergent methodologies, objectives and assumptions as opposed to there actually being multiple logics.
23. A theory of logic assumes inference, however using a single, all-encompassing theory to determine everything about the universe, may hinder rather than aid efforts to further our understanding and knowledge. That is, although it may be possible to assimilate the world we live in through an all-encompassing logic; such a theory might not provide the best understanding. This has ultimately given way to a number of alternative logics, allowing for the variation of possibilities within logic. A semantic notion of theories.
24. Theories are a set of models from which it is possible to predict what may happen under and within various circumstances. What is present in all of them is present in one of them. If you replace one theory with another, some of the possibilities under the first theory may not be possible under the second. Yet the theory of logic provides the most encompassing possibilities; if logic was to be easily replaced or altered there would be no solid basis from which to theorise.
25. Ultimately, how one describes the world will depend on how one looks at the world. However there must be a series of ground rules that all logics, or theories, can abide by. Although open to negotiation it would be assumed that this would require consistency and completeness, and have empirical adequacy.
26. Different modes of thinking and ways of approaching the world encompass different languages, understandings of truth and different methodologies. Although it may not be possible at this moment in time to articulate a truly common understanding of logic it is important that there is a dialogue between disciplines, going some way to provide an understanding of the other perspective.

## The language of logic: the other perspective

27. How the terms logical and illogical are used will depend on how each individual applies the two concepts; 'logic' can represent both the relationship between ideas and concepts, as well as being the rational and methodological underpinning of research. In

a similar fashion, 'illogical' can determine when rules of deduction are not followed or as a way of inferring that a thing cannot be so, based on that thing's surrounding context.

"Differences between the two disciplines can be seen within the discourses that are used."

28. One of the main differences between science and religion is their exploratory boundaries. Employing the notion of modal logic from philosophical theology, possibility and necessity can provide insights into the way logic is affected by boundaries, as well as how boundaries are affected by logic. If something is logically necessary it holds that it is logically possible, in all worlds. For example it is conceivable that there are an infinite number of possible worlds, however they are not our actual world, or alpha.
29. Engaging in modal logic goes beyond explicitly engaging with the actual world. The infinite number of real worlds could include a carbon copy of our world, but with aesthetic differences. These worlds are possible but not actual. This idea provides an important distinction between the two disciplines in question, science and religion. Whereas theology works within and amongst these possible realms, science is concerned with the existence of, and occurrences within our own Alpha world.
30. Subsequently, when speaking about God's existence it is possible to assert that God is not simply present in Alpha, but transcends the boundaries and exists in the infinite number of possible worlds. Moreover, denying the existence of God in one world is to deny the existence of God in all possible worlds.
31. Given these independent boundaries, criticisms should not be made of the other for notwithstanding one's own methodology. Certain scientific practitioners are committed to the notion of metaphysical naturalism dictating the realms of possible knowledge. However this is said to betray what is assumed as the logic of science, in that metaphysical naturalism cannot be sufficiently grounded in empirical or experimental scientific research. Science is based on a rational contingent order. For theologians however the contingent order has a divine purpose, represented through God, but is at the same time distinct from it. God is not an object in alpha.
32. This alternate notion of a contingent order is not however to say that faith is unscientific. Instead, both disciplines gain their knowledge from what has been referred to as tracking reality by externalist epistemologists. This refers to 'the capacity of our minds to track veridically and articulate the objective rationality inherent in the contingent order'. Our knowledge about God's ability to transcend boundaries within and outside of the Alpha enables us to understand how the divine purpose provides order to nothingness.
33. It may appear however that the two disciplines are not as opposed in their logics as may have once been thought. In fact instances in which there are differences between the two can be beneficial to both. It is possible view science's understanding of faith by examining what is known as the human dimension of science. According to Wigner's account, theories of physics are miraculous in their beauty; the fact that the laws of physics and maths mandate so much, but the simple question of how maths and physics, and their respective laws, both work is difficult to explain. Nothing in the natural world can account for this, hence the notion of it being a 'miracle'.
34. Is then, a miracle simply a religious concept? For people of faith it is not a stretch to associate the creation of the universe, and with it the laws of maths and physics, with divine rationality. Given that 'we have the mind of Christ' (1 Corinthians 2:16) humans are able to understand this rationality, providing faith with a coherent and systematic logic.
35. In his notion, Wigner also posits that the beauty of maths and physics are grounded in something more profound than just being right, or correct. The aesthetics of a discovery or equation can play a role in its trajectory, with the allure of beauty contributing to a higher level of interest when assessing what is worth pursuing from both a scientific and a personal point of view. Consequently, following a structured form of logical inquiry does not necessarily lead to scientific discovery. Instead progress within the

discipline is connected to creativity, intuition and in some cases miracles.

36. The notion of beauty however can be a misleading. A subjective concept, beauty is often relative to a specific time and place. If an equation is eloquent and correct to one person it may just be correct to another, without any notion of elegance impacting how they view the equation.
37. The methodologies employed by science and religion do have certain similarities. The scriptures, mentors and saints used to learn about religious traditions can be related to the use of books, PhD supervisors and the great scientists in the accumulation of knowledge within science. However theology's methods can be seen as being less clearly defined and are more open to interpretation as questions such as, 'what are the main criteria?' and, 'what are the rules of enquiry?' can have multiple answers.
38. Differences between the two disciplines can be seen within the discourses that are used; whereas science uses specifically defined terminologies to convey new findings and discuss applications within the field, religion uses ordinary, everyday language. It is also true that the same word can have separate meanings; life for example can be both an imminent self-perfecting action as well as an autonomous network of actions. The methodology and discourse of science also supports the idea that science is more tolerant towards new ideas being introduced into the discipline. Does this in turn support the notion that science is a less personal discipline than faith? Would this have any impact on either their own or indeed on the other discipline?
39. The creative capacity of humans is well known. However creativity needs to have some form of transcended ideas, regardless of which religion an individual subscribes to. The basis of creativity will not change from religion to religion, for example it is possible to practise science irrespective of religious belief. Methodological naturalism offers a common practise of science that both believers and non-believers can all accept as science. This however is different to metaphysical naturalism which does not account for supernatural concepts, consequently excluding much religious belief.
40. There is also a notable differentiation between faith and belief, with faith being an altogether broader and indeed deeper concept than belief. It is possible to have faith without belief. Within Christian communities there is a strong relationship between worship and practical action as a part of one's faith, the two reinforce one another. Is this a similar relation to the one between social responsibility and science?

"A definition of understanding includes knowledge, an explanation, and experience in the first instance."

### **Understanding the other: do we understand how the other perceives and interprets our own understanding?**

41. In order to firstly generate, and secondly utilise an understanding, either of one's own perspective, or indeed the other's, the term must first be unpicked. A definition of understanding includes knowledge, an explanation, and experience in the first instance. This is paired with the ability to then apply what is thought to be understood to new concepts. Beyond this simple explanation understanding also represents a fluid concept for which nothing is completely static; it is not protected from change or alteration, and very much open to interpretation.
42. These are all issues that need to be considered when attempting to understand the 'other'. One way of doing this may be to identify the different relevant variations of logic; the example of a paradox can be used to explore this idea. Christian theology, philosophy, and science all understand paradox in a specific way. Be it a contradiction in terms, Christ as fully human and as a spiritual God; a mistake in reasoning causing a proof to be invalid; or a necessary reanalysis of either a scientific theory or experiment, paradoxes are not simply transferable notions.
43. Having understood the individual syntax and semantics that make up a concept it becomes possible to explain and interact with the concept. Understanding those elements of 'the other's' discipline also affords a better position of understanding. It is

from this position that it may be possible to develop a framework of interdisciplinary similarities, aiding the translation of logics into other logics. This could represent something similar to a Gauge Theory.

44. The problem of generalising the understanding of these concepts lies with the danger of removing the initial interest in the 'other'; the very components that identify something as being the 'other' are by definition lost when things are generalised. A further problem of an interdisciplinary framework is choosing which form of logic provides the best characteristics to interpret the given circumstance.
45. An alternative to generalising may be to elect one determination of logic and apply it as the prominent version of logic. The pitfalls of this notion however are great. To claim that one logic is better than others is to relegate the very semantics and syntax that contribute to the other logics. Moreover individuals will choose the appropriate logic within a field using prior understanding; it may not even be possible to understand something within one discipline using the logic of another discipline.
46. A solution to competing logics could instead be found within open interdisciplinary discussions. This can be done through a number of mechanisms such as reflecting non-defensively on the limits of individual disciplinary logic, conducting research into the investigative nature of different logics, through employing epistemic humility, and testing the boundaries where the disciplines often collide with one another in order to strengthen both collectively and individually, and ultimately using the other as a referent from which to understand oneself. These can all be achieved through engaging in events that are outside an individual's normal jurisdiction, and by establishing interdisciplinary work forces.
47. Ultimately this highlights a need to leave any feelings of superiority aside and learn from one another; each logic has its own criteria and should not act as a tool to validate other subjects. Through seeking to firstly understand the other correctly, and secondly to be understood correctly shows an element of care or pride in what the other thinks; there is a mutual assumption that each discipline will enact the correct mode of investigation in order to gain knowledge. Furthermore the knowledge gained from understanding the other can assist in defending one's own views by debating on another individual's, or discipline's terms.
48. Is it too idealist to assume that understanding the other is enough? It is for example possible to understand something whilst objecting it. One stark difference between science and religion is that science is claimed to be a universal phenomenon, whereas religions are more culturally localised. Consequently science can and must be proven everywhere, but religions are reflected by regional variations and often contrast with one another. The tools of philosophy however may contribute to a solution to these differences, providing the necessary bridges for disciplines to coincide with each other.

"An additional hindrance to gaining common ground, or indeed a common understanding are the prejudices held by each of the disciplines towards their other."

### **Are we in a position to articulate a common understanding of logic?**

49. What is truth and knowledge and what is logical or illogical, can go through cycles in the history of humankind as the level of knowledge increases. The integrated effect of knowledge changes the definition of things. The combination of what is known is crucial. Will it allow a common understanding of logic?
50. The systematic theory of good reasoning is represented by logic, characterised by a normative, rather than descriptive property. Logic is neutral, and in an ideal world it is meant to apply to everything, this raises the question as to whether there should even be a common logic. The notion of logical pluralism is therefore also challenged.
51. Reasoning is a central aspect of logic and can be categorised in two main ways, deductive and non-deductive reasoning. Within deductive reasoning it is not possible for the premise to be true, if the conclusion is false, whereas within non-deductive reasoning a true premise does not automatically necessitate a true conclusion.



Deductive reasoning is commonly associated with formal science and the need for proof. Alternatively, non-deductive reasoning is associated and employed in the natural, social and historical sciences.

52. Is the truth absolute? Can the truth be absolute? What role, if any, does relativism play? Harmless relativism highlights the importance of context with truths; some elements depend on contexts such as time, location, and even tastes. For example a truth about the weather, 'it is/is not raining' may only be true in one location as the weather will vary geographically.
53. Multiple logics exist, and incompatible logics exist, with some disagreeing on key logical concepts such as what denotes valid inference. Will these opposing logics peacefully coexist or do they compete with one another? Introducing additional truth values beyond true and false may provide a solution; values such as open future, vagueness, institutional mathematics. This creativity may have the ability to progress the 'limits' of logic, and disciplinary differences.
54. The creativity can come in the form of breaking down ideas and providing answers to questions that are seemingly divisive. Issues are often raised or brought into the fore by 'first order' questions such as, 'Does science pose a threat to religion?' Are religious beliefs less secure than scientific beliefs? Do scientific and religious modes of enquiry use different logics? And, is what counts as 'warrant' or 'justification' for scientific beliefs the same as for religious beliefs? When posed individually these questions can be difficult to answer and hinder progress.
55. 'Second order' questions such as, 'how do we set the boundaries for discussions within which those first order questions can be raised and sensibly discussed?' provide a step from which these barriers can be broken down. Through enacting the tools of virtue epistemology it may be possible to further improve the ability to find common ground. A 'virtue theory' of argument would focus on the extent to which virtuous character traits, such as courage, honesty, and kindness are present. This form of evaluation differs from those focusing on the impact something has, whether positive or negative, or whether it conforms to established morals.
56. Virtue epistemology is interested in how, and the extent to which agents believe their own outputs, and whether they exhibit certain virtuous characteristics. By focusing on the individuals who are advocating the arguments it is possible to identify the relevant virtues which can then impact on whether these virtues can be transferable. If these virtuous characteristics can be exhibited more widely it may be possible to answer some of the first order questions in a constructive and inclusive manner.
57. An additional hindrance to gaining common ground, or indeed a common understanding are the prejudices held by each of the disciplines towards their other. For example some scientists and philosophers regard religious belief as being dumb and idiotic; scientists have accused philosophy of being a 'dead' subject; whereas theologians have been known to accuse science and philosophy of operating within a 'bankrupt worldview', and an environment that is driven by self-interest. Removing these biases and stereotypes can have a great impact on the ability to coincide on an intellectual basis. Ultimately, answering the second and first order questions can expand the focus to go beyond that of just logic to include knowledge, belief, justification, and rationality.

### **Maintaining and extending the conversation**

58. Communication is key to maintaining and extending this conversation. Academic works, multi-disciplinary conferences and events, and efforts to make sophisticated knowledge readily accessible in the way of language translations are three distinct platforms of discussion that can aid the development of this subject matter.
59. Education will also play a role in extending and maintaining the conversation.

“Solutions could include instigating a platform for regular conversations, inviting important and relevant individuals and organisations to contribute in dialogues and discussions.”

Universities each have their own syllabus and teaching styles which can lead to a lack of conformity that inhibits the possibility of dialogue. The absence of natural sciences at Pontifical universities puts those in attendance at a disadvantage when engaging in with other disciplines.

60. Despite the communications between scientists and theologians, logic remains a divisive area. Theological text books reference expressions including divine logic, and salvation logic; however this does not coincide with scientific logic. In the aftermath of World War Two, natural sciences were replaced with social sciences at Pontifical universities. It is becoming increasingly difficult to reinstate a natural sciences department due to constraints on resources.
61. Solutions could include instigating a platform for regular conversations, inviting important and relevant individuals and organisations to contribute in dialogues and discussions, whilst new insights and ideas can be pursued in line with educational efforts. It is important for the next generation to be able to communicate properly, articulating a combined knowledge of both science and religion.
62. Part of maintaining and extending the conversation requires disciplines to be open to new discoveries and embrace revisions to the current, or an established world view. Being open to change can be intimidating and will require adjustments, however new ideas can power new discoveries and provide answers to old problems. Does there need to be a universal secular morality in order for progress to be possible? Problems can arise with seemingly incompatible views, the ‘binding problem’ is one such problem. It introduces the issue of confirming world views in the sense of the natural and supernatural; religions for example accept of two realities, the natural and supernatural, however science requires natural explanations for supernatural phenomena.
63. There is an urge to know more about ourselves and the world we live in. Gaining knowledge enables individuals to ask questions about issues and ideas that were previously unknowns. Humans can therefore still be spiritual without believing in a higher order. The awe of discovery is integral to maintain engagement in these discussions and extend the conversation further afield. If scientists are able to engage more with society it would be hugely beneficial.
64. It is clear that the relationship between science, religion and philosophy matters a great deal and the need to continue the communication and indeed the potential for collaboration between them matters a great deal more.

## Conclusion

Logic is used to construct meaning. However the context in which logic is used can determine the characteristics it encompasses, as such there may be an argument for a wider framework in which to use logic. For the varying disciplines that interact with logic this may ultimately be counterintuitive. The origin of the Big Bang for example is a source of contention and may not be suited to a singular logic. Additionally faith is a deeply personal matter, and condensing religion down to one interpretation of logic would, to some extent encroach on this. In order to make progress to overcome divisions both between disciplines, and within them, Philosophy can be used to provide clarity and find a solution.

Theories make it possible to make predictions, but must include a set of ground rules from which theories can be based. Although the ‘theory of logic’ provides the most encompassing possibilities from which to theorise, a person’s outlook on the world will influence the way they describe it. Dialogue remains a key element of aiding the understanding of the ‘other’ perspective. Both science and religion maintain different exploratory boundaries, and these boundaries should be respected and not judged or critiqued for notwithstanding the other’s methodology. Understanding elements of the ‘other’ provides a better position from which interdisciplinary similarities can be identified,

reducing the scope for competing logics.

Engaging in interdisciplinary discussions, conducting research into the limits and nature of logic, employing humility towards the other disciplines, and testing the common boundaries of disciplines can all aid the progress of finding a 'solution' to competing logics. Both communication and education are key contributors to maintaining and extending the conversation from which the next generation of scientists, theologians, and philosophers can articulate a more robust combined interdisciplinary knowledge.

**Harriet Oliver**

Wilton Park | April 2016

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