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RESPONSE

Naturalizing natural theology

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We would like to thank the commenters for their stimulating responses to *A Natural History of Natural Theology*. Natural theological arguments, such as the design, cosmological, and moral arguments, have an enduring appeal. In spite of repeated declarations that these arguments are fatally flawed or even theologically misguided, they keep on popping up, not just in western culture (e.g., classical polytheist Greece and Rome, Medieval Christian Europe, early modern Europe, and contemporary American and European authors), but also in other belief systems, such as classic Hindu thought and the medieval Muslim world.

Our book uses tools of the cognitive science of religion (CSR) and other cognitive sciences to explain the continued cultural success of natural theological arguments. Until recently, CSR has mainly been employed to explain the cultural salience of ordinary religious beliefs and practices, such as belief in big gods or the transmission of minimally counterintuitive narratives. The consensus in CSR was that theology is not subject to the same cognitive constraints as folk religion, but that it is cognitively unnatural (in McCauley's [2011] terminology). There was no research on the cognitive underpinnings of religious argumentation in natural theology and the philosophy of religion. In fact, some authors, such as Norenzayan (2013, p. 181), claim that religion and analytic reasoning are incompatible: "apologetics is doomed to failure as a philosophical enterprise because it fails to capture how our minds accept the plausibility of religious belief." Yet apologetics is not doomed by any standard, as the success of popular books, such as *The God Delusion* (Dawkins, 2006) and *The Reason for God* (Keller, 2008) indicates. In our book we argue that the enduring popularity of natural theological arguments is no coincidence, but that it results from stable features of human cognition, which can be elucidated with the cognitive sciences.

Both F. LeRon Shults and Jeppe Sinding Jensen point out that cultural and historical factors help shape natural theological views, next to the individual cognitive propensities that were the focus of

our discussion. Natural theologians assume that the existence of an omnipotent, omniscient, and omnibenevolent deity is at least a plausible hypothesis. They use natural theological argumentation to confirm or disconfirm the existence of this being. To explain where this assumption comes from, we need to look at cultural context: as Jensen rightly points out, "The cultural milieu is where most humans would acquire their 'prior assumptions about the existence of God'."

In our book we focus on individual cognitive biases about the plausibility of religious beliefs (so-called content biases) to explain the enduring appeal of natural theological arguments. We have argued that these content biases originate from evolved intuitive ontologies, such as intuitive propensities to seek causes and to identify agents as causes (which underlie the cosmological argument). In our focus on content biases, we do not deny that social and cultural factors play a role in shaping natural theological argumentation. While the choice of this focus for the book did not permit us to fully consider the role of context biases, which look at the social and cultural circumstances under which representations are transmitted, we discuss them briefly in chapter 8, where we look at the argument from miracles. As we argue in that chapter, miracle narratives are minimally counterintuitive, which explains why they are retained in memory and have a transmission advantage. However, this does not explain why people accept some miracle stories as true, and dismiss others as fictitious. Consider two accounts of miraculous births: the Buddha who was born from his mother's side, walked several steps immediately after birth, with lotus flowers springing from every step, and Jesus whose birth from a virgin was indicated by a star, and announced to shepherds by a host of singing angels. Christians usually do not accept the Buddha's birth account, and most Buddhists reject Jesus' birth narrative. The reason for this difference is that Buddhists are part of a religious group where the Buddha's birth story is regarded as true, whereas Christians are part of a cultural tradition that regards the virgin birth of Jesus as veridical. A recent study by Corriveau, Chen, and Harris (2015) showed that young children from Christian households are more likely to accept miracle stories (drawn from biblical narratives) than children from secular households. This study has sometimes been taken to demonstrate that children from religious households are more gullible, whereas it actually establishes that children are sensitive to context biases of their culture, and thus more readily accept an explanation invoking God if they receive frequent testimony that God exists, as happens in Christian households. Like Jensen, we hold that a full explanation of people's prior assumptions about the plausibility of God's existence needs to take such cultural factors into account. However, contra Jensen, we maintain that even at this higher level of explanation, cognitive science is useful: the evolved propensity of children and adults to readily trust in testimony (see chapter 8 for details) can explain why people accept theological claims and miracle stories from their own traditions as factual.

We agree with Jensen that "[v]ery few people have direct, intuitive beliefs based on perceptions of superhuman agents," but we disagree with his claim that immediately follows, namely that "for all others it is reflective beliefs all the way down." Humans sometimes hold highly arcane reflective beliefs that have no grounding in intuition, and that are purely testimony-based, such as "Every elementary particle or quantic entity exhibits the properties of both particles and waves" or "The Trinitarian God of Christianity has one substance but consists of three persons." Typically, these are metarepresentations that have been acquired through education. However, most beliefs, including most religious beliefs, are supported by intuitions that make them plausible. For instance, the view that God created the world (a reflective belief) is supported by the teleology humans spontaneously discern in their environment (a set of intuitive beliefs). Although the views that natural theologians and philosophers of religion argue for are reflective, the intuitions that serve as premises in their arguments are intuitive.

Jensen does not acknowledge the continued role of intuitive modes of cognition in the formation and transmission of religious beliefs. He argues that "the cognitive science of religion may point to some important generative mental mechanisms and their properties but it still does not really provide insights into the selective mechanism on the socio-cultural levels." In epidemiological models of cultural transmission (e.g., Sperber, 1996), which are at the basis of a lot of CSR theorizing (e.g.,

Boyer, 2002), both intuitive ontologies and culturally transmitted representations are required to explain the differential cultural success of representations. In the cultural institutions where natural theology is conducted, such as monasteries and universities, humans are still subject to content biases: some ideas are more in line with their intuitions, and thus, all things considered, have a transmission advantage. As we have argued, the extent to which natural theological arguments are successful depends crucially on how plausible they seem, and the plausibility of premises is influenced to an important extent by content biases.

Shults also argues for the prominence of cultural factors in natural theology. He wants to go a step further than Jensen, recommending that natural theologians and philosophers of religion re-evaluate their prior assumptions in the light of the fact that they are influenced by their cultural milieu, in a way that makes their arguments unreliable:

> Supernatural agent abductions are not simply prior "assumptions" or "probabilities," but biased hypotheses powerfully protected from critique by ongoing participation in the shared imaginative engagement of a particular religious coalition, wherein one is constantly required to send credible and costly signals of commitment to other in-group members.

We disagree with the claim that natural theological arguments are mainly written with the aim of signaling commitment to in-group members. To the contrary, we found that many natural theological arguments are formulated in a context of intellectual diversity, in particular one where naturalistic worldviews are on the rise. As we note in chapter 1, early natural theological arguments tended to emerge in predominantly theistic cultures which fostered non-theistic alternative accounts of reality, such as atomism in ancient Greece and Rome, or Sāmkhya, a rationalist school of Hinduism that did not affirm the existence of gods and denied them explicitly as final cause. The new outburst of natural theology in analytic philosophy of religion since the 1960s can also be seen as a countermovement to the rising influence of naturalism in philosophy and everyday life.

While natural theological arguments are not primarily signals of commitment to in-group members, cultural and historical factors can also explain why these arguments are mainly formulated to support the existence of God (or in polytheistic traditions, the gods), rather than the actuality of tree spirits, trolls, or mermaids. In past societies, natural theologians also considered religious practices and ideas that we would now deem frivolous. For instance, Cicero (45 BC/1923) defended using animal entrails for divination purposes and Augustine (5th century/1972, 5th century, book XIV, chapter 24) argued that humans before the fall had perfect control over their bodies, including the ability to fart musically without any noxious smell. That these and other questions are no longer seen as worthy of natural theological reflection is a historical contingency. Shults speculates that "most educated people in general" consider claims "about UFO abductions, the detection of spirit-guides at a séance, celestial forces fulfilling astrological predictions, or the presence of trolls in the Norwegian forest" as "bunk." He is underestimating the diversity of supernatural beliefs even in educated adults. After all, only about 50% of science majors surveyed at an American public university believe astrology is not scientific, and 78% of the undergraduates there believe that astrology is at least to some extent scientific (Sugarman, Impey, Buxner, & Antonellis, 2011). Why then are gods given a pass? We think there is no principled reason why natural theologians should limit their discussions to narrow thin concepts of God. Clearly, there is a poverty of topics in natural theology and in philosophy of religion more generally. Due to their Christian or post-Christian background, philosophers of religion tend to regard generic theism, Christian theism, and scientific naturalism as the default options, and concentrate on these in their argumentation, leaving aside a rich diversity of views from, for example, Mormonism, Jainism, and Wicca.

Two commentators, Adam Green and Pierre Liénard, make explicit comparisons between reasoning in natural theology and models of scientific inference in the philosophy of science. Liénard investigates one aspect of our book, namely "the extent to which natural theological arguments might be strengthened (or undermined) by the recognition of the cognitive origins of natural theological

intuitions." He draws on the philosophy of science of Karl Popper to raise the more general question of whether matters of origin can say anything about the justification of a given belief.

In our discussion of general debunking arguments in chapter 9, we point out that beliefs that result from the normal functioning of evolved cognitive mechanisms are usually world-sensitive, i.e., they are sensitive to states of the world. Given the high metabolic costs of human brains, and given that beliefs influence how organisms interact with the world, one can predict that the majority of human cognitive capacities will track ecologically relevant properties. However, we do not go on to conclude, as Liénard suggests, that "[b]eliefs about God have their origins in intuitions naturally generated by human cognitive mechanisms. Hence, the probability of those beliefs to be justified is reasonably high." Rather, we stick to the modest conclusion that generalized debunking arguments, which aim to cast doubt on our cognitive capacities, do not work. Our claim that beliefs are generally world-sensitive does not mean that the cognitive mechanisms that shape religious beliefs are reliable in the natural theological and philosophical contexts in which they are deployed.

Liénard takes color vision as an example of what we can learn from the origins of a belief for its justification. Thanks to our understanding of the cognitive processes involved in color vision (e.g., the color receptors in the eye, processing by the primary visual cortex, processes involved in maintaining color constancy), we get an insight into how we can form the false but adaptive belief that colors are inherent properties of objects. While this belief is intuitive, it is not the spontaneous output of evolved cognitive capacities (as Liénard seems to hold). What we do form spontaneously are beliefs such as "ripe strawberries are red" and "ravens are black." The generalization that colors are an inherent property of objects is not a belief we form spontaneously, but a philosophical thesis formulated by Aristotle, and refined by medieval scholastic philosophers (Chirimuuta, 2015, p. 20). This philosophical view was unchallenged until the early modern period because it aligns well with our intuitions. The belief that ripe strawberries are red is a good example of a world-sensitive belief: redness in fruit indicates ripeness; it is a proxy for the sugars that can be found in it, and thus the nutritional value of the fruit, which probably explains why color receptors that distinguish green from red light waves had a selective advantage in frugivorous diurnal primates. To this day, realism about colors continues to be a viable position in the philosophy of perception. Unlike Liénard, many philosophers assume that evolutionary facts about color perception are relevant to this discussion (see Chirimuuta, 2015 for an overview).

The question of the relationship between the context of discovery and the context of justification was prominent in mid-twentieth-century philosophy of science. Popper did not think the context of discovery could say much about the context of justification because he believed that, while the processes of scientific discovery were perhaps of interest to empirical psychology, they were not philosophically relevant. Since the 1980s, philosophers of science have questioned whether the strict segregation between discovery and justification can be maintained. For instance, feminist philosophers of science, such as Helen Longino (1990), have argued that the subjective factors that play a role in scientific discoveries influence scientific results.

We are puzzled by Liénard's suggestion that natural theologians should adopt a falsificatory strategy. Natural theology is not a science, and does not resemble the kinds of sciences (mainly physics) that stood model for Popper's philosophical reflections. Popper even maintained that biology was not a science, and only decades later reluctantly acknowledged that it also has laws (Popper, 1978). If natural theology were to emulate the sciences – not something we would recommend – it would have to model itself on historical sciences (e.g., paleoanthropology, archaeology), not on physics or chemistry. However, the historical sciences cannot use falsification because this strategy requires universal laws, which are rarely invoked in historical disciplines. Instead, historical scientists use a combination of induction and abduction to reach their conclusions. For example, a thin globally attested layer of volcanic ash containing iridium was regarded as decisive evidence that a large asteroid impact was responsible for the Cretaceous–Tertiary mass extinction about 65 million years ago (which, among others, wiped out the dinosaurs). This finding did not falsify other hypotheses,

such as contagious diseases or global climate change, but it did present a decisive piece of evidence in favor of the asteroid hypothesis. Similarly, natural theologians seldom see a piece of evidence as a decisive falsification, but rather see it as strong evidence (a "smoking gun," in Cleland's [2002] terminology) that a given hypothesis is more likely than its competitors. For example, the fine-tuning of cosmological constants and physical laws is often taken as a smoking gun in favor of a design hypothesis of the universe, whereas suffering in humans and other sentient beings is often counted as evidence against it.

Adam Green examines our discussion of the design and cosmological arguments (chapters 4 and 5 respectively). Building on earlier work (Green, 2015), he suggests that natural theology is a form of bottom-up model-based reasoning. In chapter 4, we raise a problem for the design argument: humans do not automatically perceive design, rather they attribute it on the basis of background assumptions. Both adults and young children take the history of objects into account when they decide whether they were designed. For instance, when they are shown objects and are given two divergent reports of how these came into being, either by accident (e.g., a strip of cloth was unintentionally caught in a machine, which resulted in holes punched in the cloth at regular intervals) or by design (e.g., a person carefully cut holes at regular intervals with a pair of scissors), participants are more prone to call this object a belt if they think it was intentionally created (Gelman & Bloom, 2000). On the other hand, adults and children who heard the accidental story thought it was a strip of cloth with holes in. We argue that since design is not something one can automatically perceive, but that one infers on the basis of background assumptions, natural theologians beg the question when they use the design argument to prove the existence of a divine designer.

Green proposes that this move is not problematic, since "[a] background model can factor into a bottom-up argument without the giver of the argument begging the question." He draws an analogy with someone who uses his grandfather's map, rather than a recent one, to navigate a national park. That person uses a lot of background assumptions but she is not committed to them, and indeed can test the accuracy of the map by surveying the terrain. Similarly, "[a]dopting a design stance might reflect the background and the purposes of the natural theologian without factoring in in any elicit way." Some critics of the design argument have indeed worked within the assumptions of natural theology, as in Green's analogy of the use of the old map to test its accuracy. For instance, Sarkar (2011) argues that one would expect some redundancy to be built into natural systems if they are intelligently designed: planes have multiple engines, buildings have fire exits. In his view, the absence of such redundancy indicates lack of intelligent design. However, other critics question the usefulness of an old map. Hume (1779), for example, queried whether we can apply design intuitions to natural objects, given that these intuitions are normally triggered by artifacts, which have known designers. To further explore the map analogy, the intuitions that natural theologians rely on are an ancient map we inherited from our ancestors (i.e., evolved intuitions about design, causation, morality, etc.), that is being used for a terrain that is quite distinct from its original purpose, namely a religion such as Christianity. Critics of natural theology would not regard natural theological intuitions as grandfather's map – which after all still bears some semblance to the terrain it is supposed to map, since that was its original function – but rather as a map for an entirely different geological formation.

Kelly James Clark focuses on the epistemic status of intuitions, a topic that occurs throughout our book, especially in chapters 2, 4, 5, and 9. He points out that the use of intuitions in natural theology is similar to their use in other philosophical domains, such as ethics or epistemology. This gives rise to the following parity argument (explicitly formulated by Clark as follows, even though only implicitly present in our book): "if it is okay for philosophers to rely on such intuitions in other areas of philosophy (and they do), then it is okay for philosophers to rely on intuitions in the philosophy of religion." Clark argues (and we agree) that this does not establish that such practices are rational – at best it shows that philosophers of religion are not more irrational than ethicists and epistemologists.

This raises the question of how we can establish whether philosophical intuitions are reliable. This is an enduring question in metaphilosophy. For instance, Robert Cummins (1998) argues pessimistically that philosophers, unlike scientists, do not have independent empirical techniques to confirm or disconfirm their intuitions, i.e., they have no "test key." Philosophers can use thought experiments and arguments, but ultimately they can at best establish consensus. Consensus and strength of intuitions are correlated, but consensus by itself is not a guide for true beliefs. Clark voices this concern as follows: "Here is a way to put the problem: physicists can test and affirm/reject intuitions, philosophers cannot."

As we see it, there are at least two ways to tackle this problem. The first is to look at the role of intuitions in scientific reasoning. A number of metaphysical assumptions needed to practice science cannot be directly tested, such as that measurements are repeatable, that contingent events (except apparently at the quantum level) require external causes for them to occur, that, under some conditions, correlation does indicate causation. Thus, the scientific enterprise seems to be subject to similar problems as philosophy. One could object to this line of reasoning that scientists do not need to be committed to these metaphysical assumptions (something that Liénard voices in his comment). After all, our causal intuitions about everyday, middle-sized objects are no longer applied within the domain of quantum physics. Science is not unique in reaching counterintuitive conclusions. As Eric Schwitzgebel (2014) points out, metaphysicians start out with mundane, banal observations, such as that we use numbers to denote physical arrangements in our environment (e.g., two bicycles, two bananas). However, using those observations and philosophical reasoning, they end up with very strange beliefs that do not align with common sense, such as that the number two is an abstract entity that exists outside of space time. So philosophers and scientists are able to reach radically counterintuitive conclusions, which indicates that philosophers are not bound by their intuitions.

Another way to respond to the charge that philosophers cannot know how reliable their intuitions are is to take a naturalistic approach, which one of us (De Cruz, 2015) has recently advocated. Philosophers can look at the way intuitions function in their ordinary ecological contexts to get an idea about their reliability. For example, we commonly use intuitions in the domain of epistemology to gauge whether someone knows or merely believes something. In Gettier cases, people have justified and true beliefs. For example, Fred believes it is 3 o'clock in the afternoon based on a glance at his wristwatch. It really happens to be 3 PM, but his watch stopped functioning exactly 12 hours ago. In scenarios like these, philosophers and laypeople (see Nagel, San Juan, & Mar, 2013) judge that Fred does not have knowledge, although his beliefs are both true and justified. The intuitions elicited in Gettier cases are products of our intuitive psychology (theory of mind), and draw on our ability to attribute beliefs and other mental states to others. Since it would be evolutionarily advantageous to distinguish knowledge from an accidentally (lucky) true belief, we can expect that intuitions that underlie knowledge claims in epistemology are quite reliable. While we agree with Clark that it is difficult to test the soundness of intuitions in philosophy, we think that not all philosophical intuitions lie outside the scope of a naturalistic investigation into their reliability.

Unfortunately, as we detail in chapter 9, this way of validating intuitions does not work for natural theology due to the generality problem. For example, it is not clear that one is justified in extending a claim that works well in our everyday environment (e.g., all contingent events require an external cause for their existence) to the universe at large. Given that natural theologians routinely generalize everyday intuitions beyond the realm of common sense, it is hard to determine in a principled way whether such extrapolations are warranted.

By way of conclusion, our book can be situated in philosophy of cognitive science, particularly philosophy of cognitive science of religion. Thus, our aims are somewhat different from those of natural theologians and philosophers of religion. While they address questions about the ultimate nature of reality, we examine the sources of intuitions that drive natural theological arguments, thus also shedding light on the rationality of this enterprise.

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