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THE ARGUMENT FOR GOD'S EXISTENCE FROM AI

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Abstract

I provide a novel mental argument for God's existence that makes crucial use of the nature of the field known as artificial intelligence (AI). The underlying bases of the argument include not only what specifically undergirds AI, but the formal, i.e. logic-based, foundations of computation in general.

Keywords: arguments, God, existence, artificial intelligence, logic

1. Introduction and plan for the paper

Modern deductive arguments for God's existence that *use* AI, specifically the science and technology within AI of automated reasoning, have been recently published [1, 2]. Automated reasoning is the original 'success story' in AI, as e.g. confirmed by the reaction to the remarkable (for its time) Logic Theorist system that nobelist Herbert Simon brought to the original 1956 DARPA-sponsored conference at Dartmouth, where modern AI dawned. Logic Theorist automatically found proofs of some (propositional-calculus) theorems from Russell & Whitehead's [3] *Principia Mathematica*, a feat that at the time bordered on magic, in the eyes of some. Automated reasoning is also probably the part of modern AI that is most directly related to Philosophy and Logic. (A very nice overview of automated reasoning is provided in [4]. A classic introduction to automated reasoning based on what is known as the inference schemata of *resolution* is provided in [5]. Comprehensive, up-to-date introductions to AI have excellent coverage of automated reasoning [6, 7].)

The type of arguments that have tended to be the focus in such work fall into the *ontological*-argument family (which I dub $\mathcal{O}$); that is, an argument of a type that can ultimately be traced back to its 11th century primogenitor: Anselm [8]. Allow me to point out that there is some interesting internal structure to the family $\mathcal{O}$, but discussion of this structure is out of scope for the present paper. I will mention only one feature of this structure, which is that a sub-family in $\mathcal{O}$

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took root once some thinkers began to use modern modal logic in order to achieve greater rigor in the arguments in question. The sub-family $\mathcal{O}_m \subsetneq \mathcal{O}$ can be labelled in English by *modal arguments for God's existence*. A truly excellent survey of $\mathcal{O}$ from its inception to the 21st century, including nice coverage of some formidable members of $\mathcal{O}_m$, is provided in [9].

Now, as to Anselm's core idea, when put as a barbaric synopsis, it was that God, understood to be the greatest being that can be conceived, quite possibly exists for all that we know - but since such greatness includes existence (a non-existent being having, after all, rather limited power!), God, if genuinely possible, must exist. Reasoning of this general sort was given independently by Descartes [10], then improved upon by Leibniz (for coverage, see [11]), and then became much, much more powerful when Gödel attempted to improve upon Leibniz's version. The reasoning in a version of Gödel's modal argument for God's existence has been formally verified by the logico-mathematical systems and technology of modern automated reasoning in AI [2].

In stark contrast to the reasoning one finds in the members of $\mathcal{O}$, the argument that I give in the present paper is not an argument that *uses* AI; rather, it's an argument (in significant part) *from* AI. I will try to explain why it is that the progress of AI (in conjunction with other relevant information) implies, in conjunction with other more-than-plausible propositions, that God exists. As the reader will doubtless have surmised, when I use the proper name 'God', I follow Anselm, Descartes, Leibniz et al. and refer to the supernatural person who is at once possessed of all the so-called 'omni' properties (omniscience, omnipotence, omnipresence, omnibenevolence, etc.), and is also the uncausable and unpreventable creative source of all that is contingent/physical, including specifically, and perhaps most importantly given the reasoning I present, human persons. (In my experience, some are puzzled by reference to the properties *uncausability* and *unpreventability*. As I have not the space to explicate them here, I direct readers to explanation from James Ross [12].) As to personhood, I do not have the space in this short essay to definite this concept. I have done that elsewhere [13, 14]. Orthodox Christianity's doctrine of us being created "in the image of God" (Genesis 1.27) is on these definitions easily shown to plausibly distil to simply that many of the central attributes of personhood, absent in the case of nonhuman animals, are ones we possess by virtue of being created persons.

In short and summing up, 'God' herein is the name of the being claimed to exist in all the major creeds of Orthodox Christianity; in particular, the Nicene Creed can serve well for present purposes. (Orthodox Christians of course also hold that Jesus was and is divine. For a readable defence of this doctrine that is credally anchored, see [15].) Some readers may be of the view that 'God' as used in some other theistic religions has the same meaning as it has for me herein and in the relevant creeds and scripture such creeds directly reflect, but this topic must be left aside as firmly outside the scope of the present paper. I would say only that such readers must take care to ensure that they don't as a matter of fact have in mind *henotheistic* religions. Orthodox Christianity, along with the scripturally based form of Judaism from which it emerged, is decidedly non-henotheistic. Islam is as well.

I have said that the argument given below doesn't fall into the family $\mathcal{O}$. What family, then, is my argument in? Broadly speaking, the argument given herein, 'The Argument' as I label it, is a *mental* argument: it is overall an attempt to infer the existence of God from mental properties found in some beings in some domain or sphere. To this family, that of *mental arguments for God's existence*, I assign the mnemonic label '$\mathcal{Me}$'. This family includes, for example, the argument from consciousness to the (more-likely-than-not) existence of God given by Swinburne [16], an impressive ensemble of arguments that included a mental one I refuted, yet said could, given more work in its general direction, perhaps be refined and rescued [17].

Some readers may wonder whether there are additional families of arguments for the existence of God beyond the two I have commented upon. There certainly are. In fact, the family I regard to be perhaps the strongest, is $\mathcal{Mo}$ = *moral arguments for God's existence*. One striking virtue of the best members of this family is that they are stunningly short and simple. An excellent overview of the family that displays the efficiency of some of its members is [18]. In particular, an exemplar in $\mathcal{Mo}$ in this regard is due to Robert Adams [19], which simply asks those who agree that there are moral obligations that bind us to consider what the explanation of this state-of-affairs could be, if not a morally perfect = omnibenevolent God. The argument I give below, that is The Argument, it will be shortly seen, likewise simply asks readers to consider what explains the state-of-affairs that we have extreme cognitive powers not needed by our immediate evolutionary forebears, whose *modus operandi* AIs will soon enough be able to match despite not having our extreme cognitive powers.

The remainder of the paper unfolds in the following straightforward sequence: Next, I set out the background needed to articulate the argument for God's existence from AI (§2). The argument itself is then presented in §3. I then consider some objections, and reply to them (§4). Things are brought to a close with a few concluding remarks, among which is a recommendation to agnostics that they view things from a certain 'meta' perspective that allows belief to be based in part on the power of the *families* of arguments.

2. Background

Some background is required in order for The Argument to be articulated, and I supply it now without delay.

2.1. Needed Rudiments of 'Wallace's Paradox'

The first part of the background needed in order to state the argument in question are a few basic facts underlying and arising from consideration of what is known as 'Wallace's Paradox' (WP), nicely presented within the context of modern computational cognitive science (which intersects with, indeed arguably subsumes, AI) in [20]. (In earlier work [21], I have shown that Pinker [20] fails to solve this paradox, despite trying.) Synoptically put, WP, which was pressed against Darwin by Wallace (these two men of course being the co-discoverers of evolution by mutation and natural selection, but the latter, unlike the former, refused to believe that the power of the human mind arose by such evolution from mental powers in the lower animals), arises from the fact that our immediate ancestors, all of whom were hunter-gatherers, had cognitive power sufficient to do such things as invent and use (the differential and integral) calculus, a key part of the branch of Mathematics known as *analysis*. Any number of other parts of classical Mathematics could be cited here, but this is my selected anchor for the present paper, for reasons that need not be fully given. I also allude, below, to some of the set theory that underlies analysis.

Now, when I say ‘our immediate ancestors’, I’m talking about beings who, like us, are members of *H. sapiens sapiens*, and had the same ‘cortex-heavy’ brains we are blessed with; but who, unlike us, not only lacked agriculture, but lacked all infinitary mathematics (and hence lacked the branch of analysis that subsumes the calculus), and completely lacked any need to use any such mathematics to survive or - sometimes - thrive as they lived in hunter-gatherer style. Note that I write ‘*sapiens sapiens*’ rather than ‘*sapiens*’ to distinguish us from all other hominins. (The reader can consult [22] for an economical catalogue of all hominins according to the current fossil record.) WP arises from the remarkable fact that the cognitive power needed for higher mathematics was for tens if not hundreds of thousands of years wholly unnecessary for hunting and gathering (and for other activities, ones associated with domesticating by trial-and-error flora and fauna) - and yet the capacity to develop such mathematics was within the cognitive reach of hunter-gatherers! Of course, it is mathematically possible that the capacity could have been installed in *H. sapiens sapiens* very recently by forces/processes having nothing to do with evolution. But not only is this implausible and *ad hoc* (I touch upon this below), but if this possibility is taken seriously, it only bolsters The Argument.

Now, Wallace asked Darwin: How, pray tell, can it be that hunter-gatherers had this intellectually powerful reach? There was after all no increase in the survivability of hunter-gatherers accruing from this dormant, untapped capacity, so how can evolution, consisting, as you and I have informed the world, in the selection/reinforcement of mutations because of their positive effect on survival value, explain the arrival of and long-dormant state of these elevated cognitive powers? Wallace held that the obvious answer to this question is a clear ‘It can’t!’. I certainly agree.

Again, note well that in particular hunter-gatherer members of *H. sapiens sapiens* had no infinitary mathematics (though they had the dormant potential to develop this mathematics: witness us), and *a fortiori* made no use of this level of mathematics in their daily lives. (Analysis, as my readers will well know, is from its first step infinitary in nature, and even introductory textbooks make plain. A nice one at the graduate level is [23], which quite predictably opens with an invocation of the natural, real, and complex numbers.) As readers will also know, without a firm concept of infinite magnitudes and infinite progressions, the calculus is impossible to set out, explore in proof-theoretic fashion (so that theorems can be established to add to a growing body of knowledge), and use in order to design and develop technology. But to do all that hunter-gatherers did, they made no use of such mathematics whatsoever.

2.2. Needed rudiments of AI, in particular logicist AI

AI, or artificial intelligence, is the field devoted to the design and implementation of *artificial agents* [6, 7, 24]. Such agents are things that compute functions from that which they perceive in their environments (i.e. *precepts*) to the *actions* they perform in these environments. It is a thoroughgoing assumption in all corners of AI that the computing of this type of precepts-to-actions function consists in computation. That is why, for instance, one can write a computer program as part of the building of artificial agents; for when the program is executed, a computation is caused, and - if things go well - the function is computed. Lucid, authoritative technical coverage of functions, computer programs that compute them, along with a rich logic and mathematics developed from these 'building blocks', all more than suitable as a foundation for understanding what AI fundamentally amounts to, is provided in [25].

For our purposes in the present paper, a particular kind of AI is important to put on the table: viz., *logicist* AI. This is the type of AI I do concrete work in, and have for decades; it's also a kind of AI I have defended, repeatedly (see e.g. [26]). But what is relevant for our purposes is understanding the essence of logicist AI, and understanding that this form of AI conveniently provides the formal bases upon which cognitive power at different and ascending levels can be rationalized. Given these bases, there is a much more formal version of The Argument than presented below available, given this. Cognitive powers are left informal herein, but they could be regimented crisply by appeal to formal hierarchies. For example, we could use the Polynomial, Arithmetical and Analytical Hierarchies if we confine ourselves to a natural-number/digital backdrop. If computing over the reals is selected as our backdrop, which ultimately is no doubt appropriate given the powers of the human mind in dealing with analysis that I emphasize herein, things get rather further from standard computation; see e.g. the inspiring [27].

It is quite easy to understand logicist AI. We have only to say that the functions mapping precepts to actions that are the formal backbone of artificial agents, that is - to use an alternative language - of AI or AIs designed and produced by the field of AI, are in the case of logicist AI computed by automated reasoning, top to bottom. That is, the actions taken by AI/artificial agentsin this approach are the result of automatically found proofs/arguments that offer these actions as those to be performed in light of what has been perceived (and of course, any number of other factors).

The agents that can be created by the field of AI - in an overloading of 'AI' introduced above, and that is common linguistic practice - can be called 'AIs' and the class of such agents called 'AI'. Given how the field of AI is defined (in the textbooks, see again e.g. Russell & Norvig [6]) AIs/artificial agents have a determinate level of cognitive power. This level of cognitive power can be pinned down in either of two fundamental ways: one can look to the formal logic and mathematics of the situation (in which case this aforementioned book is an ideal resource: [25]); or one can look at matters empirically. In the latter case, this means looking carefully at artificialagents that have been implemented, their behaviour visible by direct human observation. We can for example look with our own eyes at the performance of real, physical robots in our world.

We obtain a convenient way to conceive of the distribution of artificial agents across a spectrum of cognitive power if we take the first of the two routes described in the previous paragraph (i.e. the formal one), especially if we anchor this route to logicist AI. The reason is that in this kind of AI, each artificial agent a_a must be based upon some formal logic:

$$\mathscr{L} = \langle \mathcal{L}, \mathcal{J} \rangle \tag{1}$$

where the first member of the pair here is minimally a formal language and the second is some collection of inference schemata over which reasoning is to happen. While an agent could be based on a *collection* of logics, I leave this possibility aside to expedite matters. We would after all always be able to find the most powerful logic in such a collection, and use it to pin down the cognitive power of the agent in question.

Taking the first route immediately gives us a way of pinning down the cognitive power for an artificial agent, because each formal language will have limitations on what it can express, and each logic overall, because of the particular $\mathcal{J}$ for that logic, will be limited by what can be inferred in it. For example, the propositional calculus $\mathscr{L}_{PC}$ has a formal language bereft of quantifiers, so it can't express for instance even 'Every even natural number greater than 2 is the sum of two prime numbers', but this can be easily expressed in first-order logic $\mathscr{L}_1$. Yet everything that can be expressed in $\mathscr{L}_{PC}$ can be expressed in $\mathscr{L}_1$. Moreover, where $\phi_{\mathscr{L}}$ is some set of formulae in some logic $\mathscr{L}$, we can consider the closure $\phi^{\vdash}{}_{\mathscr{L}}$ under provability as regimented by $\mathcal{J}$, that is, the set of all formulae that can be proved from $\phi_{\mathscr{L}}$ by following the inference schemata $\mathcal{J}$. Given this, we can build an order on the formulae that are in closure sets. I leave many specifics aside in the present short paper, but do mention that in our case, we know from the discipline of reverse mathematics (which overall asks what formal logics and content therein is implied by what our mathematics is like) that the cognitive power brought to bear in doing infinitary mathematics, including specifically analysis, makes use of second-order logic $\mathscr{L}_2$, which can express and prove things beyond the reach of $\mathscr{L}_1$. (For the classic defence of the need for second-order logic in human-explored mathematics, see [28]. For the current definitive overview of which logics are needed for which branches of mathematics, see [29].) It is important to note well that the attributes I am pointing to as ones that a given logic $\mathscr{L}$ have or lack are often orthogonal to underlying computation. For example, I reported that well-known facts that $\mathscr{L}_2$ is more expressive than $\mathscr{L}_1$, and $\mathscr{L}_1$ is more expressive than $\mathscr{L}_{\mathrm{PC}}$ - but this is completely different than *computing* with, or at least associated with, these logics.

We are now in position to say that the cognitive power $P^{\mathfrak{a}}$ of a given artificial agent $\mathfrak{a}$ corresponds to the formal logic that in turn bounds what precepts, actions, and other relevant propositions (e.g. what $\mathfrak{a}$ knows, as a set of propositions represented as formulae) in its percept-to-action life through time can be expressed. The cognitive power of a given $\mathfrak{a}$ also bounds what reasoning is possible over this declarative information. If we then have a class Z of artificial agents we can by simple extension understand the cognitive power of this class to be P^{Z}. Where Z and Z' are two such classes, we then write $P^{\mathrm{Z}} < P^{\mathrm{Z}'}$ to say that the cognitive power of the latter is greater than that of the former. But we also have at our disposal these binary relations for setting out relative cognitive power of a class of artificial agents (or, if we choose, of a particular artificial agent): = ≈ ≤.

These binary relations make good sense in terms of the formal logics that underlie our logicist artificial agents; this is easy to see, as follows. If we have two logics $\mathscr{L}$ and $\mathscr{L}'$ that are merely syntactic variants of each other but otherwise the same, we can say $\mathscr{L} = \mathscr{L}'$ and correspondingly say that where class Z of agents is based on $\mathscr{L}$ and class Z' of agents based on $\mathscr{L}'$ that $P^{\mathrm{Z}} = P^{\mathrm{Z}'}$. In some cases a pair of logics will be fundamentally equivalent even though there are significant differences (e.g., when two collections of inference schemata are radically different but don't affect what is ultimately provable or not). In this case, we can say with respect to the agents upon which they are based, that $P^{\mathrm{Z}} \approx P^{\mathrm{Z}'}$. From here, ≤ is used in the obvious way.

In addition, we can immediately make some formal sense of increases in cognitive powers for classes of agents that are *continuous* or *discontinuous*, according to underlying formal dividing lines, ones that are created by metatheory in formal logic. (I will here only sketch things.) In this metatheory, we sort out the applicability of properties such as Turing-decidability, soundness, and completeness for logics. For example, theoremhood in $\mathscr{L}_{\mathrm{PC}}$ is Turing-decidable, but is not in L_1. (Note that formula $\neg(p \rightarrow q) \rightarrow p$ in $\mathscr{L}_{\mathrm{PC}}$ is a theorem, in the sense of being provable in any standard collection of inference schemata for this logic; $p \rightarrow q$ isn't. A Turing machine, when given an arbitrary formula of $\mathscr{L}_{\mathrm{PC}}$ cannot infallibly render such a decision.) We can say that the cognitive power of some class of agents Z is discontinuous with the cognitive power of some class of agents Z' if and only if the logic upon which Z is based is distinguished from the logic upon which Z' is based by a fundamental difference in metaproperties, for instance one consisting in the fact that the first logic is decidable whereas the second isn't.

2.3. Using the notation for reference to particular cognitive powers

We can now use a simple framework, and corresponding notation for it, in order to speak efficiently about relative cognitive power of agents in general. This way of speaking will allow the The Argument to be presented efficiently, and in such a way that its (formally valid) structure can be seen.

First, let us think in terms of not just artificial agents, but agents in general. We are agents, thus; not artificial ones, but we are still agents. (Presumably we do more than take precepts to actions, but let us leave the need to expand this AI-rooted mapping for the case of human person here.) Let us specifically denote the cognitive power possessed and deployed by our hunter-gatherer ancestors by 'P^{HG}' and the power deployed by us when doing higher, infinitary mathematics as in the case of analysis by 'P^{∞}'. And let us denote the cognitive power deployed by AI of today, and in the foreseeable future, by 'P^{AI}'. (We are here applying logicist AI to all artificial agents. Note that such agents, as a general rule confirmed by the textbook I cited above [6], are based at most on but $\mathscr{L}_1$.) Note that while P^{AI} is invoked from the standpoint of how AI is defined in the literature, and of my own experience designing and building artificial agents, I don't mean to suggest that this symbol refers to some ultimate upper limit on AI's cognitive reach into the future beyond what can be foreseen. Such a limit likely is Σ_1, in the Arithmetic Hierarchy (i.e., roughly the semi-decidable for Turing machines). Recall that we have allowed $<$ and $\leq$ to be available in regimenting the order in question on cognitive powers for various beings, artificial and natural. The situation is analogous to considering that all powers are in some vast collection roughly in parallel to all numbers, 0, any finite number (or any size of the cardinality of any positive integer), the integers themselves, positive and negative $\mathbb{Z}$ the rationales $\mathbb{Q}$, and the reals $\mathbb{R}$. These sets, as we know, can be arranged in Cantorian fashion from the smallest (finite subsets of $\mathbb{Z}$) to the largest, $\mathbb{R}$, and of course we can keep going. (Further discussion of ordinal and cardinal numbers could take place here. But then matters would get technical, and with a small potential return on the investment made by engaging in this discussion.) I will be the first to admit that the full specification of the ordering of cognitive powers would require much more space and time to set out. But I think at this point we have a sufficiently firm handle on the underlying order to articulate The Argument, to which we now turn.

3. The Argument itself

Given the background now laid down, we can proceed to the deduction proper. This deduction makes direct use of the notation we have availed ourselves of above (§2) to view cognitive power as falling upon a continuum (but again, we concede that no fully developed formal theory of such power and the continuum is provided). We further avail ourselves of an analogue to 'set subtraction' for collections of cognitive powers, so that, just as we can say that, where A and B are sets, that:

$$\{x : x \in A \wedge x \notin B\} \tag{2}$$

is the set A - B composed of all members of A not in B, we can refer to P^{Z} - $P^{Z'}$, the cognitive powers in P^{Z} 'minus' those in $P^{Z'}$. Very well; now here is the chain of reasoning in question (Table 1).

Table 1. The Argument.

Inferred	Label	Proposition	Justification
	(1)	Hunter-gatherers possessed the cognitive power P^{∞} to e.g. invent the calculus and create literary art of the calibre of Blecher/Proust/Ibsen/. . . .	undisputed
	(2)	AI shows us that these early versions of us, to hunt and gather, needed only humble cognitive power P^{HG}, where $P^{HG} < P^{\infty}$, because $P^{AI} \approx P^{HG}$ where P^{AI} is a limit on the cognitive power of AI), and AIs can hunt and gather.	see AI today
∴	(3)	We have (P^{∞} - P^{HG}).	abstraction (1), (2)
	(4)	Our having (P^{∞} - P^{HG}), *contra* Darwin, is inexplicable by gradual mutation and natural selection (i.e. P^{∞} is discontinuous from P^{hg}).	see critique of *DoM* see theorem/proof
	(5)	If our having (P^{∞} - P^{HG}) is explicable, then $E1 \vee E2 \vee$ God exists ($\in \Gamma$).	sub-argument
	(6)	Our having (P^{∞} - P^{HG}) is explicable.	undeniable
	(7)	$\neg E1 \wedge \neg E2$	sub-argument
∴	(8)	God exists.	modus ponens disjunctive syllogism (5), (6), (7)

The Argument should be easy enough for the reader to understand, but I will explain some key parts of it to ensure that such understanding takes root.

First, there is the mysterious appearance of the parenthetical '($\in \Gamma$)' in intermediate conclusion (5). Here I'm simply indicating that the proposition that God (as defined above) exists is in fact a core proposition within a set Γ of propositions that should be fairly obvious to anyone familiar with credal, historical monotheism. Γ includes such propositions as were indicated above: not only that God exists, and is an 'omni-*X*' divine person, but also crucially given the focus of the present paper that this being is the creator of all that is contingent, including a lesser category of persons: us. It is Γ overall that provides an explanation for the remarkable fact that we have extreme cognitive power that is utter and absolute 'overkill' when it comes to finding berries and killing wild animals.

Now to proceed to deeper issues, no doubt premises (4) and (7) will meet with the most scepticism among the premises in The Argument, and therefore I reserve discussion (and brief defence) of them until the next section (§4), but otherwise I now comment on The Argument from top to bottom now, along the way taking some care, naturally, to defend the other premises: (1), (2), (5) and (6). (Technically, to repeat, (5) is an intermediate conclusion, not a starting premise.) Here we go.

Premise (1) is an empirical fact. For a bit of 'colour' I injected into this premise reference to phenomena related to literary cognitive power, to augment my focus on mathematical cognitive power. **(**In earlier work, I explained that because human-level cognitive power in the realm literature includes extreme forms of creativity, artificial agents of even the most vaunted sort fall short, and there are no signs that things will be better for AI in the future [30].) As far as I know, (1) is simply not disputed today. After all, we are certainly members of *H. sapiens sapiens*, and on the literary/linguistic side, we count Blecher and Ibsen and Proust, however extraordinary they may have been, not as aliens, but as members of our class. We also have, on the infinitary-mathematics side, not only those who invented the calculus (Leibniz and Newton, separately) and refined its mathematical underpinnings (e.g. most prominently, Robinson [31], who showed that Leibniz's conception for the calculus of infinitely small quantities - i.e. *infinitesimals* - are thoroughly respectable, mathematically speaking), but we have those who managed to achieve profoundly informative results regarding some of the formal set theory that underlies analysis, for example G**ö**del. (In his case we have for example his proof of the consistency of axiomatic set theory (ZF, specifically) with the Continuum Hypothesis (and the Axiom of Choice) [32]. This is Gödel's greatest theorem/work, reprinted in [33].) The commendable honesty with which Pinker grapples with WP in his *How the Mind Works* [20] is to my knowledge the best place for those having any degree of reluctance to affirm (1) to start their further investigation.

Next, what are we to say about premise (2)? Is it plausible? It is in fact much *more* than plausible: it is an empirical fact increasingly displayed before our very eyes. For we see that AI is producing ever-smarter artificial agents, and the path is certainly one that will before long allow for the engineering of robots able to match the behaviour of hunter-gatherers. This match is *foreseeable*. More concretely, we are certainly heading toward a time during which we shall have it within our reach to engineer robots able to gather berries and hunt down even wild megafauna (as individuals and in co-ordinated groups). Of course, we don't have such robots *today*. It is still very hard for the most sophisticated humanoid robots to open doors they have never seen before, let alone do things like hunt wild animals in co-ordinated fashion with other robots (or with humans). But I literally can't imagine any rational human, with knowledge of AI and the contemporary landscape of fruits it has produced in the form of modern artificial agents, denying that AI is on a smooth trajectory toward robots with the behavioural arsenal of hunter-gatherers. Any sceptics would do well to face the fact that, at least in the United States, AI has long been chiefly funded by Defence- and Intelligence - oriented programs, and the impetus from the agencies that sponsor such programs (DARPA, e.g.) will continue to seek AI and robots that can team with humans in very sophisticated ways - ways that, sooner or later, will at least match the day-to-day behavioural reach of hunter-gatherers.

Notice that I say 'sooner or later'. Again, we don't *today* have robots that, say, do a lot of first-rate hunting, let alone farming (which *H. sapiens sapiens* 'figured out' after hunting and gathering. (This 'figuring out' calls for very little cognitive power, and is well within the reach of foreseeable AI. For some readable, engaging description of the simple trial-and-error problem-solving involved, see [34].) The idea is that, to repeat, it is clearly *foreseeable* that such machines will arrive (barring some catastrophe, such as an asteroid annihilating planet Earth). The foreseeability of this future is expressed as premise (2) in The Argument. For a robust discussion and defence of this foreseeable future see [35].

It is important to note, and the present juncture seems to be suitable for doing so, that premise doesn't rely upon any such proposition as that human persons hypercompute, or are hypercomputers. (Hypercomputation (a.k.a. *super-recursive* or *super-Turing* computation) is the processing of Turing-uncomputable functions, the mathematics of which (and increasingly also the physics of which is now quite robust.) This is a proposition that I affirm, and have defended at length in print [36-38]. Given this proposition, there is a rather efficient, ironclad route to deducing that we aren't (wholly) the product of evolution (at which point, in this line of reasoning, one can then, as in The Argument, seek an explanation for our hypercomputational power). The route is simply that from the (A), (B) and (C) it is easy to deduce (D); witness:

(A) Evolution by mutation and natural selection is a process entirely at the level of Turing-level computation.

(B) Theorem: No Turing-level process/machine can produce a hypercomputational process/machine. Proof: Suppose otherwise, and suppose without loss of generality that a Turing-level process/machine m produces a machine m' capable of solving the *Entscheidungsproblem*. Then Church's Theorem is (absurdly) contravened, since to solve this problem m can first produce m', and then of course enlist m' to solve the problem. QED

(C) Human persons are hypercomputing machines. Therefore:

(D) Evolution by mutation and natural selection didn't produce human persons.

Now let us turn to consideration of the inference to (3). This inference is unexceptionable. If the argument was more formal, we would be able to mechanically infer by abstraction using higherorder logic ($\mathscr{L}_2$ would suffice) that we have the powers in question: the specific collection of powers centering on those needed for and used in infinitary mathematics, specifically in real analysis. For readers unfamiliar with what I am saying here, consider the property on natural numbers of *being greater than 10 and less than 30 and also prime*. Clearly, we could express this property in a (rather lengthy) formula ϕ in first-order logic that for predicate symbols employs $<$, $>$, $=$ and $\div$, etc. But once we have ϕ neatly set out, we are now free to abstract and introduce the new, convenient predicate symbol S, one that sums up all of ϕ. Then when we can write simply $S(17)$ and $S(29)$ to express truths that would require prolix constructions in first-order logic. I have reasoned in directly analogous fashion when I infer that we have the property (P^{∞} - P^{HG}).

What about premise (5)? This premise, strictly speaking as noted above an intermediate conclusion, simply expresses at heart that if the theistic (specifically Christian; see above) explanation Γ for our having remarkable cognitive power in the realm of infinitary mathematics is rejected, then, since the straight Darwinian explanation has been cut down, there are really only two remaining possibilities: E_1 and E_2. The first of these can be labelled 'seeding' and the second 'exotic natural force'. I shall ask in the next section whether either of these is credible, but what premise (5) says is that we have here a trio, and a trio only, to consider as remaining options for how to explain our having (P^{∞} - P^{HG}). As A. Bringsjord has pointed out (conversation) to me, this trio should perhaps be expanded to include reincarnation (E_3), the idea being that the earliest human persons could be reincarnations of natural beings with personhood, but without the biological markers of *H. sapiens sapiens*. But this possibility just reduces to the 'seeding' possibility (= E_1), since the natural persons coming before us then must be explained, and hence no progress against The Argument has been made. After coming to see in more detail what E_1 and E_2 amount to (again, next section), the reader will need to ponder whether there are any additional available options for making sense of the fact that we have these remarkable powers.

We come now to premise (6). This premise directly reflects the view that we cannot simply declare that our having the extreme cognitive powers we do (which are beyond those developed and deployed by hunter-gatherers) is simply inexplicable. To put what (6) is based upon in another way: That we have the cognitive powers needed to do analysis, and have and continue to use these powers, is a state-of-affairs that must have some explanation. Any reader of a rationalist, scientific persuasion will of course be loathe to reject (6). I readily admit that a formal version of The Argument would allow explicability to be explicitly weakened so as not to presuppose anything as strong as the Principle of Sufficient Reason; see for example Principle E in [12, p. 124].

Now we turn to additional objections, and start by considering the two premises that will be the most controversial among those in The Argument.

4. Further objections - replies

4.1. 'Both premises (4) and (7) are vulnerable!'

Let's now as planned consider the strength of the two premises yet to be assessed: (4) and (7). As I've said, these are bound to be seen by sceptics as vulnerable chinks in The Argument.

As to premise (4), if the reader surveys afresh the tabular presentation of The Argument, s/he will observe that I say this proposition is justified in either of two ways: by appeal to a certain 'critique' of Darwin's [39] *Descent of Man* = *DoM*, and secondly, by some proof that establishes (4) as an outright theorem.

The critique I have in mind is my own, but I can't give it here: it is much too long for that. The basic structure of the critique is to first simply report that Darwin explicitly admits that the cognitive powers of modern humans (in keeping with the foregoing, let us refer specifically to those mathematical cognitive powers of these beings that are bound up with analysis) cannot be the product of gradual (evolutionary) development if these powers are discontinuous with canine cognitive powers, and to secondly show that such discontinuity is utterly clear. Darwin in *DoM* repeatedly declares that canines reason and problem-solve (and he gives numerous anecdotes that feature dogs supposedly reasoning things out, such as avoiding travel on thin ice over bodies of water), and that therefore - putting things in the scheme I have erected - there is a continuous series of steps from canine cognitive power P^{C} through P^{HG} to P^{∞}.

Note that the gradualism Darwin advocates is no mere outdated idiosyncrasy of his; rather, such gradualism, including specifically *cognitive* or *intellectual* gradualism from the nonhuman-animal case to that of the human-person, is intrinsic to the view that evolution by mutation and natural selection is wholly responsible for our presence on the scene, as that view is affirmed right up to the present day. In short, the continuity that Darwin defends is part and parcel of 21st century evolutionary orthodoxy. This is for example why Penn et al. [40], writing in our century, could title their paper 'Darwin's Mistake', and have their attack upon Darwin rationally viewed as an attack on the orthodoxy of today. (But their case for discontinuity avoids any observations of, and inference therefrom, the logico-mathematical and linguistic prowess of *H. sapiens sapiens*.)

The bad news for Darwin and those firmly in his camp today, is that the nature of the inference schemata that enabled the activity involved in discovering, laying out, charting, and refining analysis is a sockdolager against Darwin's elevated view of the canine mind, and any such gradualist claim that these minds aren't qualitatively feeble relative to ours. For instance, no reasoning carried out by a canine is in any way an anticipatory precursor to reasoning based on the inference schema of, say, mathematical induction, a schema without which analysis wouldn't be within our grasp. Given how continuity/discontinuity of cognitive powers were defined above, there is complete discontinuity between reasoning to the conclusion 'This ice is dangerous!' from precepts and experience, versus reasoning based on the schema that if some attribute A holds of $0 \in \mathbb{N}$, and holds also of $n + 1$ whenever it holds of n, then A holds of all the (infinite) natural numbers.

I point out that even when we leave aside mathematical or linguistic abilities possessed by *H. sapiens sapiens*, we see discontinuity. For instance, in work that serves to at least indirectly bolster my case for (4), Penn et al. [40] show that, even when leaving aside appeal to the linguistic or mathematical abilities of modern humans, and contrary to what Darwin [39] explicitly claims in his *DoM*, there is in fact an acute discontinuity between *H. sapiens sapiens* and nonhuman animals.

But what of the other basis for (4), the supposed proof of discontinuity between P^{HG} versus P^{∞}? Well, what I have just said points the way to how such a proof can be obtained. To understand this, consider again Darwin's dogs, and suppose that their way of reasoning is not to use general inference schemata such as modus tollens, that is:

$$\frac{\Phi \rightarrow \Psi, \neg\Psi}{\neg\Phi}\, I_{MT} \tag{3}$$

where any declarative statements can be substituted for ϕ and ψ, but rather concrete perception-to- action rules that simply fire when the relevant perception (e.g. 'Ice with cracks here!') happens. Here we have acute discontinuity in the two underlying formal frameworks. When we feature instead an inference schema that regiments mathematical induction, the point becomes clearer still, because as a matter of formal, provable fact, such a schema is not derivable from a schema built just on perception-action conditionals with variables for the precepts and the actions.

But what about a proof of discontinuity specifically between P^{HG} versus P^{∞}? This is what would fit The Argument. Well, I am quite sure that discontinuity can indeed be proved here; certainly it can be proved even now on an eminently reasonable assumption regarding how powerful a logic is required to undergird behaviour at the level of hunter-gatherers. The assumption is that first-order logic, $\mathscr{L}_1$, is more than sufficient to undergird P^{HG} (cf. my discussion of first-order logic in [21]). Given this, and given what we now know about the cognitive powers grounded out in formal logic that are required for our favourite focus herein, analysis, discontinuity is secured. Why? The reason is that, within analysis, Banach spaces require cognitive power undergirded by second-order logic, $\mathscr{L}_2$, and since major meta-properties separate $\mathscr{L}_1$ from $\mathscr{L}_2$, discontinuity is established. (To see details confirming that Banach spaces as treated in human mathematics draws upon $\mathscr{L}_2$, see [29, p. 45].) Finally, what about premise (7)? As indicated in the argument itself, (7) is in fact not a 'straight' premise: it is instead an intermediary conclusion, one that expresses the ruling out of two alternative explanations of our having distinctive cognitive powers, relative to our hunter-gatherer forebears. The reader will have seen, and can see again now, that two alternative explanations are pointed to: E_1 and E_2. What are these? They are:

E_1 The explanation of the state-of-affairs that we have the cognitive powers (P^{∞} - P^{HG}) is that some powerful extra-terrestrial beings 'seeded' or 'injected' these powers into the brains of hunter-gatherers so that eventually the wonders we know and use (e.g. the Analysis branch of Mathematics) would arrive, once our species figured out how to use the powers that were injected.

E_2 The explanation here is that some unknown, exotic natural force outside of known physicalscience caused it to be the case that we have the cognitive power that enables us to makeand harness discoveries in analysis.

If either proposition E_1 or E_2 (and this is of course an *exclusive* disjunction) holds, then my argument is derailed. Fortunately (given that I am persuaded by not only the argument in question, but other members of both families $\mathcal{O}$ and $\mathcal{Me}$), I have discussed this pair elsewhere in some detail, and found them wanting [21]; hence I shall say very little here. My economy is also borne of my belief that rational readers will in any case be quite reluctant to take either of these candidate explanations seriously. It is worth noting that if something like E_2 is taken seriously, then it will be conceptually impossible, forever, to find that a non-natural or supernatural explanation holds sway in rational dialectic with regard to some state-of-affairs ϕ. As if by magic, the naturalist can simply baldly declare that 'Oh, yes, well you see, that's due to an unknown, exotic natural force. I don't know what it is, and have no evidence regarding it, but that's what did the trick.' If this is not begging the question I don't know what it is.

Of course, objections to The Argument will be voiced that don't involve a direct attack on one of its premises. For example, I have little doubt that some critics will complain that while my logicist framework for cognitive power might work well enough in the case of *artificial* agents, it doesn't work at all for *natural* agents like us, because - so the criticism here goes - our lives are much more than the application of reasoning in a logic through the duration of our existence. In response, I certainly grant that (e.g.) we have subjective consciousness, and that having such consciousness is in large measure why we judge life worth living, but on the other hand, the more austere, rational side of our existence is quite real and quite meaningful, and it is this side that logic does a fine job of capturing. (Actually, logic is in fact the only game in town.) This is reflected in the fact that formal logic is the basis for such things as decision theory and planning and game theory. Since it is the rational side of our existence that The Argument is concerned with when cognitive power is used within it, the logicist framework for cognitive power seems perfectly admissible in *both* the artificial and natural case.

4.2. 'You are blind to the possibility of evolution as underlying mechanism!'

Here is how the objection in question can be expressed: 'Formal discontinuity and evolutionary discontinuity are not the same thing; they are not the same kind of discontinuity. Formal discontinuity is concerned with differences in ability (e.g. soundness, completeness, decidability, expressiveness; a.k.a. (meta-)properties) that, by their very nature, hold regardless of how a logic is realized (i.e. the mechanism)). Evolutionary discontinuity, on the other hand, is solely concerned with mechanism: it does not care a wit about ability. While it is true that mechanisms can enhance or detract, enable or hinder, abilities, only the mechanism (or more accurately, the genetic blueprint for the mechanism) is capable of transmission to descendants. The fact that the exercised abilities of a species at time t is formally discontinuous from those of its ancestors long before t does not imply that that the species through the relevant timespan is evolutionarily (e.g. genetically or neuro-physiologically) discontinuous.'

My reply is three-part, as follows.

In point of underlying formal fact, I rely only upon a univocal sense of discontinuity, one fully captured by formal logic; this is true in no small part because when I refer to formal logics (including both object-level constructs and meta-level constructs) I refer *ipso facto* to mechanism, and indeed to its level of power. The reason this is so simple: formal logic and computation are the same; and specifically, standard Turing-level computation that - as we've noted - bounds AI as defined and pursued today and in the foreseeable tomorrow, is nothing more than inference in $\mathscr{L}_1$, something made plain in modern proofs of the Turing-undecidability of theoremhood/validity in $\mathscr{L}_1$. All the familiar formal hierarchies of power in computation are actually (best) expressible in formal logic, from speed and efficiency as in the Polynomial Hierarchy [e.g. see the elegant analysis and ranking of the difficulty of games in the PH in [41], made possible by the employment of formal logic (specifically constraint logic)] to points above Turing-computability in the Arithmetical (based on $\mathscr{L}_1$) and Analytical (based on $\mathscr{L}_2$) Hierarchies. Even forms of computation that involve infinitely long expressions, and processing runs that take infinitely long, are captured in formal logics (infinitary ones). The overall upshot is that The Argument is based on a formal conception of mechanism that causes no loss of generality when compared with for instance standard procedural accounts of computation. Specifically, when a class of agents is known to have a level of cognitive power corresponding to its use of a given logic, it must as a matter of ironclad necessity have a corresponding set of mechanisms. It is important to understand that my rebuttal to the objection presently under consideration doesn't imply that I'm relying on any such proposition as that human persons hypercompute when doing profound mathematics. (I discussed this proposition above, as the reader will recall.) I am speaking of, and employing, an inseparable isomorphism between formal logics as a way to specify and carry out computation, and computation that may be characterized in procedural terms.

Moreover, and this is part two of my response, it's important to understand that I'm employing a level of description for agents that is steadfastly above any such level as is used for mechanism described procedurally. If discontinuity is proved at this level of description, based upon this level's formalisms, that is sufficient regardless of what might be said about activity at a low level of description. Note well that we have no way of for example studying sheer procedural mechanism at work (e.g. in the operation of a large Turing machine) and understanding from that study what is happening at the level of, say, quantification over relations and functions, and reasoning over such content. As a matter of limitative fact, we cannot even tell what functions the Turing machine under scrutiny is computing; this disturbing fact corresponds to a number of theorems in computational learning theory [42]. Note as well that when people have attempted to characterize Evolution in terms of mechanism, the process does end up getting cashed out fundamentally as the operation of nothing more than a Turing machine (e.g. see [43]). Of course, the sceptic might reply that his reference to 'mechanism' shouldn't be taken to refer to the operation of low-level, procedural machines such as Turing machines. But whether we are talking about the operation of Turing machines, or some account of the movement of sub-atomic particles that is more exotic than this (e.g. super-Turing quantum computers), nothing changes; for it remains a fact that at the self- contained level of description at which I'm operating in order to characterize cognitive power, the discontinuity invoked in The Argument is firmly in place.

Now to the third and final part of my reply to the objection here considered: Of course, 'mechanism' in this discussion is not precisely defined. What does the term mean? A bit more demandingly put, what does 'the mechanism of evolution' mean? Clearly, the idea is related to the concept of mechanism as employed in the study of computation, where we say such things as that a function f can be expressed as a 'mechanical procedure', which is a process through time carried out by a 'mechanical device' such as a Turing machine. (Such language is used verbatim in the textbooks covering computability and uncomputability I have earlier recommended [44].) But beyond this, the specific idea at hand is that evolution *itself* is a mechanical process in this sense, and that as such it has little to nothing to do with cognition. Lending credence to this view is the established body of work on *evolutionary computation*; see for example [34] for broad coverage, and on genetic algorithms specifically see [45]. However, evolutionary computation is simply not relevant to my argument, for the simple and undeniable reason that there is no bridge available, even in principle, from low-level computation like this, and cognition and cognitive power. This is after all why we have fields like 'evolutionary psychology', carried out in the complete absence of any formal nexus between genetic algorithms at their low level of description, and high-level cognition that distinguishes modern *H. sapiens sapiens*, expressed at the level of formal logic.

4.3. 'You don't really know what logics characterize human intelligence!'

The sceptic is here understood to object in this manner: 'You simply do not know what logic or class of logics characterize the intelligence of human persons, or, for that matter, of canines or baboons. It could be, for all you know and all that you have told us, that human persons reason in a sound yet incomplete fragment of $\mathscr{L}_2$, or it could be that they are characterized by unsound inference, or non-deterministic inference.'

This objection is an instance of the strawman fallacy, which has plagued many a thinker and many a debate for going on three millennia. I do not claim in any way to have found *the* logic that characterizes any class of beings. I simply observe what logic must be employed in order to rigorously understand given activity carried out by a given thinker or class thereof. In short, whether or not some particular kind of intensional logic that includes third-order extensional logic (= $\mathscr{L}_3$) - and here I use a better term, one that is the appropriate technical one from formal logic - *captures* the cognition of a given agent or class thereof is something quite separate. The point can be made simple, as follows. If one wants to express in a formula ϕ_s in some formal logic that (*s*) every buffalo buffaloes (= awes) at least two buffalos, where we imagine that some agent *a* believes *s*, then the plain fact of the matter is that the propositional calculus is insufficient to express this belief (since it lacks quantification). Now if $\mathscr{L}_1$ is then brought to bear, yielding for instance:

$$\langle s \rangle : \quad \forall x[Bx \rightarrow \exists y, z(A(x,y) \wedge A(x,z) \wedge y \neq z)] \qquad (4)$$

and then some intensional operator B is also deployed and applied to $\langle s \rangle$, this success in no way shows that some quantified epistemic logic that subsumes $\mathscr{L}_1$ characterizes the cognition of those agents who know, believe, and otherwise reason over such propositions as are expressed by $\langle s \rangle$. Hence my critic ascribes to me an ambition that I do not in the least have.

An important consequence of my circumspection as explained in the previous paragraph is that, to use language that might assist the reader, I am always and only looking for the *minimal* logic that must be invoked in order to rationalize the cognitive behaviour that is observed. I am *not* saying that we can make any leaps to proposing *the* logic that captures the cognition of a class of cognizers. A more colloquial way of putting the situation would be to say that I am only asserting what the 'floor' must be for the logicist elements underlying the cognition we perceive. The flip side of the coin here is that I also refrain from making any such claim as that a given logic is a 'ceiling' for a given class of cognizers.

4.4. 'But there are many deities!'

Since surely we can really only rationally note that there are in fact many deities that are claimed to exist, I charitably express the objection here, which has in fact been pressed against me in connection with an earlier draft of the present paper, as follows: 'It seems to me that your conception of God is rather narrow. You have defined God as - to quote you - the 'omni' being. But this means that you exclude many other deities.'

It is impossible to respond fully without simply repeating myself at length, something I have no intention of doing (which doubtless will leave some readers greatly relieved). So, here's an efficient rejoinder: Since I have minimally established that the God of credal Christianity exists (i.e. that Γ is true), and that achievement is sufficient for a project the size of what I have undertaken here, what more needs to be said? The critic here has in mind deities and associated doctrines that are inconsistent with Γ, and specifically inconsistent with the existence of an 'omni' being. (It is of course a familiar and platitudinous observation that there are pairwise inconsistent collections of such propositions. The observation is e.g. made by Dennett [46].) Are there such collections of propositions? Certainly. But the existence of such collections, and indeed of humans who affirm the propositions in some of these, casts no doubt upon any premise in The Argument.

4.5. 'You completely ignore the extinct hominids!'

This objection, which I have had expressed to me in person with a curious degree of passion, goes like this: 'You talk a lot about nonhuman animals, and hunter-gatherers. But you leave aside completely the hominids that were around when our same-species forebears were around. For instance, we know that Homo neanderthalensis were very intelligent.'

I am afraid that this objection is just plain silly. How does any premise in The Argument fall even if it be granted that every member of *H. neanderthalensis* was positively brilliant? The answer, of course, is that everything is perfectly intact even if this is granted for the sake of argument. I suspect the objector has in mind that the acute intellectual discontinuity between us and nonhuman animals, or between what we do in - to refer to my featured example - using analysis, versus picking berries and the like, is somehow threatened if there is no similar discontinuity between *H. neanderthalensis* and *H. sapiens sapiens*. But this just isn't so. And what happens when the claim that Neanderthals were brilliant is allowed to come under scrutiny? What happens is that we find evidence *against* the proposition that these hominids were really smart. Those who might find this assessment harsh, but be unfamiliar with the empirical evidence we have regarding the cognition of such dim creatures, would be well-served by studying what is available, and a place to turn first is perhaps a standard, comprehensive Biology textbook that discusses hominids in general [47].

5. Conclusions - recommended next steps

Should we conclude now that God exists, in light of the foregoing? This of course is the real question, the one that, inevitably, is in the minds of all those would genuinely study The Argument. Some readers will of course instantly declare a negative answer by reflex, but I am only concerned with those who are truly objective and cerebral in grappling with the question of God's existence. If a mind such as Leibniz's could claim to apprehend via logic the existence of God and his divine Son, it just might be prudent for the dismissive to dismiss their attitude and reflect in earnest.

My answer to the question is a confident affirmative. Not only that, but I specifically predict in confidence that as AI (and fields based upon AI: e.g. cognitive robotics) advance, the strength of The Argument will increase. Specifically, when in the future the behavioural reach of AI/robots is *observably* a match for what early members of *H. sapiens sapiens* did, while at the same time this future AI is bereft of the highest cognitive powers in P^{∞}, more will see that I stand on the side of the angels.

Allow me to end, as promised at the outset, with the recommendation of a course of action for those who take seriously the *possibility* that my argument succeeds, but just cannot bring themselves to the point of outright affirming it, and following on that affirmation believe that God really and truly does exist. The recommendation is to take two moves in succession. The first move is to consider not only the status of individual arguments pro and con on the question, but also to consider things from 'above' particular arguments, including then above The Argument. The reader will recall that I referred (§1) to the family $\mathcal{O}$ of ontological/modal arguments for God's existence, and then to the different family $\mathscr{Me}$ of *mental* arguments for God's existence, the latter family being the one that my argument from AI falls into. The alert reader will have noted that in passing I also referred to a third family of arguments for God's existence: $\mathscr{Mo}$. Now, once one has moved to a vantage point from which such families can be analysed, the second move is to begin to try to assess the cumulative strength of the families, relative to the propositions they are aimed at supporting. Standard practice is to consider only the strength of particular arguments *within* families. But this practice doesn't seem to be in line with how the rational acceptance or rejection of important propositions must be carried out, by well-read, rational agents, including such agents who are scientists. For example, the level of individual arguments is not the one at which scientists work in order to decide whether to accept some deep, weighty proposition. Instead, the totality of the case for such a proposition is weighed. Here I mean by 'the totality' a collection of families of arguments for and against on the matter at hand. Many examples can be given from Physics. For instance, does rationality dictate that the multiverse interpretation of Quantum mechanics should be affirmed? To take a stand on this question, a rational agent must look at families of arguments pro and con on the matter. Likewise, I urge agnostics to adopt a similar point of view with respect to the existence of God. There are many families in favour of the truth of the proposition that God exists, while there is - for the atheist - a scandalous paucity of families of arguments *against* the truth of this proposition; indeed there appears to be just one: viz., arguments from pain, suffering, and evil; dub this family $\overline{\mathcal{E}}$. Of course, I know full well that atheists can be counted upon to deploy some tendentiously fine-grained way of individuating their arguments for disbelief so as to diffuse the undeniable travail this side of the grave into innumerable 'different' arguments.

Unfortunately, I can't offer here a ready-make formalism for adjudicating the argumentative force of a given family $\mathcal{F}$, let alone a given family $\mathscr{F}$ of families, with respect to some weighty proposition ϕ. Nonetheless, let us say that a given family $\mathcal{F}$ provides confirmation or disconfirmation of a given proposition ϕ at some strength factor σ, and let us say that the values of σ can range in an order from *certainly not*, the bottom, to *certainly*, the top, and in this progression pass up through such factors as *highly unlikely* to *highly likely*. More specifically, let us make use of the following 13-level progression, which reflects a view of strength/likelihood as subjective, that is as how likely a perfectly rational agent believes the proposition in question to be Table 2.

As can be seen, six values are 'epistemically positive,' and six negative, with a midpoint. The likelihood values can be assigned natural numbers in any number of ways, depending upon the application at hand and what is most convenient for treatment of that application; one way is shown by a column in Table 2. Another way starts with an assignment of 1 to certainly not and then an incremental climb to 13 for certain. (For a computational logic in AI that makes use of such a range of strength factors, see [29].)

Tabel 2. The 13 strength-factor progression.

Numerical	Linguistic
6	certain
5	evident
4	overwhelmingly likely = beyond reasonable doubt
3	very likely
2	likely
1	more likely than not
0	counteralanced
-1	more unlikely than not
-2	unlikely
-3	very unlikely
-4	beyond reasonable belief = overwhelmingly unlikely
-5	evidently not
-6	certainly not

Given the 13-level progression, we can suggestively write:

$$F \rightsquigarrow \sigma\ \phi \tag{5}$$

where σ is one of the 13 values. Now let the proposition that God exists be denoted by the formula 'γ'. The Argument lends some credence to:

$$\mathscr{M}e \rightsquigarrow \sigma\ \phi \tag{6}$$

That is, this argument provides some increase to the strength factor here, relative to what it was before The Argument appeared on the scene. But recall that in the course of the present paper, three additional families have been referred to. Hence, the question that should be put on the table (after some further investigation) is what strength factor to assign to σ in:

$$[\,\mathscr{M}e \wedge \mathscr{M}o \wedge \mathscr{O} \wedge \overline{\varepsilon}\,] \rightsquigarrow^{\sigma} \gamma \tag{7}$$

I can only assure the atheist and the agnostic that the cumulative precipitate arising from such competition between the families available on the question 'Does God exist?' is just one notch below 'Certainly!' - which is to say that σ in (7) should be *evident* (i.e., level 5 in Table 2), and that The Argument has contributed somewhat to this answer. Those willing to move forward in earnest will of course need to study the families to which I allude, but I specifically suggest two immediate steps. First, study the Bayesian overarching multi-argument case for God's existence assembled by Swinburne [16]. Second, since my overarching multi-family case for the existence of God is not Bayesian in nature, but rather strength-factor-based, study the basic approach to strength factors given by Chisholm [48], which inspires the 13-valued progression in Table 1, and underlies too a smaller variant of the progression seen in [49].

I conclude by saying with Arnauld: "True reason places all things in the rank which belongs to them; it questions those which are doubtful, rejects those which are false, and acknowledges, in good faith, those which are evident, without being embarrassed by the vain reasons of the Pyrrhonists [intense sceptics; S.B.], which never could, even in the minds of those who proposed them, destroy the reasonable assurance we have of many things." [50]

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