

Science and the Nature of God: Inferring the Divine Attributes from the Status of Big Bang Cosmology

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Abstract An empirically-based understanding of the Divine existence and nature will be pursued in this presentation. The existence of God will first be addressed from an anthropic point of view, in terms of the various cosmic coincidences that have made life possible on this planet. A probabilistic proof for the existence of God--termed the Anthropic Design Argument--will then be presented as convincing evidence for the existence of an Intelligent Designer in the universe. Once the existence of a Creator has been reasonably demonstrated, the various attributes of the Divine will then be sequentially derived from the most recent cosmological data through a process of rational inference from the physical nature of the universe to the presumed nature of the Creator. The (somewhat unexpected) conclusion of this a posteriori analysis will be that the traditional attributes of God--namely His omniscience, omnipotence, omnipresence, omnibenevolence, and transcendent personal nature--are in fact the only ones that can be justifiably inferred from the nature of the empirical data.

Keywords Anthropic Design Argument, induction, inference, omnipotence, omniscience, omnibenevolence, personal

Introduction

One of the overarching ambitions of the natural theologian throughout recent history has been to establish the existence and character of God beyond reasonable doubt, purely from a careful reading of the physical evidence. In many people's minds, the first part of this objective has already been accomplished to an impressive degree, due to the recent deluge of empirical information about the origin and development of our biocentric universe. The evidence itself--which is highly compelling in its own right--suggests that some type of larger Designer was probably behind the genesis of the present cosmic epoch, but most writers have been unable to infer any more information about the likely attributes of this Creator, except to assume that these attributes were somehow able to generate the present universal structure. This means that the second half of the natural theologian's programme--namely, the scientific derivation of the various Divine attributes--has gone essentially unfulfilled. The reason for this is not far to seek, because while it might be challenging enough to try to establish, through philosophical and empirical means, the mere existence of a generic Creator, it is vastly more difficult to try to infer, in a similar manner, the individual attributes of this purported being. This is why such an elucidation is widely considered to be the Holy Grail for philosophers and natural theologians alike around the globe.

Thus far, however, we've only had the individual revelations of a few prophets to rely on in this critical area, along with the questionable insights of a multitude of different theologians and philosophers. It would therefore be nice--very nice--if we could gain access to a more empirically reliable source of information about the Divine nature, if only so we could come up with our own independent, empirically informed conclusions about the Divine nature, instead of having to rely on notoriously unreliable second-hand opinions.

Fortunately, there is such an empirically reliable source of information in existence--the entire physical universe itself! This "book of nature" is never mistaken (although our interpretations about it clearly can be

in error); hence the natural theologian's long-standing desire to see what modern science has to say (if anything) about God's specific attributes. In this sense Paul Davies' surmise that "science provides a surer path to God than religion" seems to be fundamentally correct, because the empirical data of science is inherently more dependable (and therefore more inherently trustworthy) than mere philosophical reflection per se. Of course, the natural theologian is still obliged to utilize various philosophical techniques in order to faithfully interpret the empirical data of science, but even so, the scientific realm remains one step closer to the hand of God than human reasoning power alone, because it directly emanated from the Divine creative substance. It is for this reason that an empirically-based derivation of the various Divine attributes would seem to provide the most accurate representation of God's true underlying nature.

In a manuscript presently awaiting publication, the mathematician and theologian Kevin Sharpe furthers this belief that reading the book of nature can indeed tell us a great deal about the Divine character.

If hair covered the universe, we could conclude that the Divine likes hair and probably is quite hirsute, long white beard and all. The universe behaves in certain ways, and since the Divine unfolds them, they say something about the Divine. The Divine acts like this, so the Divine must be like this. The pot reflects the mind and perhaps the fingers of the potter. The universe reflects the nature of the divine subuniverse, so you can examine it to learn about the Divinity. That's if you're open.

If the universe presents basic properties other than logic and fruitfulness, and if we accept them as divine attributes, we need to show how they emerge from our model of the Divine.....If we attribute other properties to the Divine, these too should appear as basic features of the unfolding universe. That same universe founds our ideas of the Divine. Only investigation of the universe can justify a belief, though the idea may arise from any source. The empirical method, a treasure of our culture, provides a portion of the route to knowledge of the Divine. We ask the universe scientific questions about the Divine.

In my own research into this area, I have been delighted to learn that many of the Divine attributes can indeed be legitimately inferred from a careful reading of the scientific evidence. However, my most surprising finding has been that each of these attributes is essentially identical to the traditional monotheistic interpretation of the Divine character.

The remainder of this paper will be divided into two main parts. In the first part I will seek to establish the existence of a generic creator beyond reasonable doubt, through the use of an "anthropic" interpretation of the most recent cosmological data. The result will be a probabilistic proof for the existence of God which states that, given the empirical evidence at hand, the most likely explanation for the existence of our biocentric universe is the "design hypothesis." In the second part I will seek to expand upon this concept of Intelligent Design by attempting to derive the Creator's own individual attributes from a careful analysis of the cosmological data.

The Anthropic Design Argument

A consensus currently exists amongst astronomers and cosmologists concerning the origin of the universe long ago. According to this majority position, the universe came into existence approximately 15 billion years ago in an event called the Big Bang. It was at this point that the fate of the cosmos was determined to a remarkable degree, because it was here that the initial conditions for the resulting cosmic expansion were laid down.

Chief among these fate-determining initial conditions is a group of pure, dimensionless numbers known as the fundamental constants of nature. These foundational parameters, which arose at the very instant of

the Big Bang in their present life-facilitating configuration, work together to create our universe from the bottom up, as Barrow and Tipler point out:

One of the most important results of twentieth-century physics has been the gradual realization that there exist invariant properties of the natural world and its elementary components which render the gross size and structure of virtually all its constituents quite inevitable. The sizes of stars and planets, and even people, are neither random nor the result of any Darwinian selection process from a myriad of possibilities. These, and other gross features of the Universe are the consequences of necessity; they are the manifestations of the possible equilibrium states between competing forces of attraction and repulsion. The intrinsic strengths of these controlling forces of Nature are determined by a mysterious collection of pure numbers that we call the constants of Nature.

We can construct a highly effective design argument from what is presently known about these fundamental constants. It proceeds as follows:

1. There exist invariant properties of the natural world that rigidly determine the gross size and structure of virtually everything in the universe.
2. These fundamental constants are "fine-tuned" to work together in an exceedingly delicate and cooperate fashion to make life possible on this planet.
3. The specific values of nature's fundamental constants did not arise through a gradual Darwinian process of selection from a multitude of possibilities; instead, they emerged directly out of the Big Bang in their present biocentric configuration.
4. A sufficient reason is required to explain how these fundamental parameters could have instantaneously emerged from the Big Bang in such a perfect, fine-tuned configuration.
5. Chance is incapable of accounting for the instantaneous production of this bio- centric configuration, since chance processes inherently require vast periods of time before they can construct order out of chaos.
6. There was no time at all for these accidental processes to occur prior to the Big Bang, because time itself was created in the Big Bang.
7. There was also no space or matter prior in existence for these accidental processes to operate in prior to the Big Bang.
8. Therefore, a sufficient explanation is required to explain the instantaneous production of nature's fundamental constants at the Big Bang.
9. The concept of intelligent design provides by far the best explanation for how this could have happened.

What we have here is a traditional teleological argument for the existence of God that has been fueled by the latest findings in physics and cosmology. In *God and the New Cosmology* I called it the Anthropic Design Argument, because it is centered around those fundamental parameters that make human life possible on this planet. The force of this particular design argument is irresistible, because it is very difficult indeed (understatement of the century) to imagine how such an exquisitely fine-tuned orchestration of life-supporting parameters could have instantaneously emerged from the Big Bang by chance processes alone.

The end result of this realization is that we now have a powerful empirically-based reason for believing in the existence of an Intelligent Designer for our universe. This being the case, we will now move on to ask ourselves what modern science can tell us, if anything, about the intrinsic properties of this Designer. *The Value of Inductive Reasoning in Scientific Research* The elucidation of the God's personal qualities from the scientific evidence is an inherently difficult task, because the Divine Essence is not directly amenable to the scientific method, nor is it immediately accessible to any of our five senses, since it is primarily spiritual in nature and not physical. Nevertheless, it is possible, at least in principle, to infer a significant amount of descriptive information about the Creator purely from a careful reading of the scientific evidence. For if such a Being is truly responsible for creating the universe, then we should be able to apprehend at least a few of His at- tributes merely through a thoughtful examination of that which He has

made. It can readily be seen that all created objects naturally carry within themselves at least some of the characteristics of their respective designers. If nothing else, one can surmise that any given created object will necessarily reveal at least some degree of intended (or unintended) formative activity on the part of its particular creator, due to the original causal interface between the creator and the artifact itself. While the specific nature of this formative activity may be hidden or otherwise difficult to discern, one can nevertheless be certain of its existence, due to the very existence of the artifact itself. The only way this would not be so is if the object in question had never been designed and created to begin with, because in this case there would be no original causal interface between the object itself and its creator. This tautologous conclusion may seem unenlightening, but it is just the tip of the proverbial iceberg, because the very act of creation can be seen to entail a direct causal link between any given creator and his or her created artifact, and this remains true whether the particular creator in question is Michelangelo or God Himself. This metaphysical link can therefore be seen to contain an indirect reflection of the creator's own prior activity, which, in turn, can potentially tell us a great deal about the creator's own individual characteristics. We can conclude from this that there is probably no absolute difference in kind between human creativity and Divine creativity, at least as far as this particular causal connection is concerned, because it is clear in both instances that there must be an inexorable link, or some type of initial causal contact, between the creator and the created object in question. This metaphysical necessity makes it possible for us to infer, at least in principle, from the nature of any given artifact to the existence of certain general qualities or attributes in its respective creator, and this relation would seem to hold true whether the designer in question happens to be human, Divine, or somewhere in-between.

This point can be better illustrated by means of an example. Imagine what would happen if an abandoned flying saucer were to be discovered one day by an international team of experts. Apart from the sense of fear and intrigue that would almost certainly result in certain human populations, a huge wave of inductive thinking about the nature of the aliens themselves would also probably ensue in the more rational elements of the global community. These individuals would seek to analyze the physical structure of the alien spacecraft in the greatest possible detail, so as to be able to infer as much as they possibly could about who could have built such a contraption in the first place. In the process, they would undoubtedly pay very careful attention to the spacecraft's entire range of features and properties, until they could be reasonably satisfied that they had made every legitimate type of inductive inference. Of course, this indirect method of knowledge acquisition, via the process of induction, can never be a fail-safe means of gathering data because there isn't a precise, one-to-one correspondence between the properties that are displayed by created objects and the attributes that are possessed by their respective designers. Rather, there is always some degree of interpretive ambiguity involved, which in turn can lead to any number of unsubstantiated conclusions. For instance, the existence of a laser gun on board the flying saucer could either be construed as a sign of war-like intent on the part of its alien designers or as a necessary method of self-defense for a peace-loving extraterrestrial race. It is still possible, however, to accurately infer the existence of certain traits in a particular designer, but only if one vigorously pursues this inductive mode of reasoning in both a rational and judicious manner, because the greatest limitation to be found here isn't in the indirect nature of the evidence itself, but rather in the foibles surrounding our own ability to reason accurately, and this becomes all the more true when the evidence at hand is comparatively ambiguous in nature. Interestingly, this inductive method of reasoning is not foreign to science. Rather, it is the form of logic that is most characteristic of the scientific method, because it moves from the particulars of individual observation to the elucidation of general patterns and laws. It therefore moves from effects to causes, yielding a probable (but not certain) conclusion. This isn't to say that science doesn't work with propositions that are either true or false; it clearly does. It's just that we can't be absolutely certain which propositions about the physical realm are true and which are false. Scientists therefore have to work through a variety of empirical channels in order to establish the most probable explanation for a given body of data, just as we are trying to do in this paper, by attempting to infer the various Divine attributes from the empirical nature of the universe itself.

Although this inductive method of reasoning from effects to causes is relied upon in all of the empirical sciences, it is especially valuable to the particle physicist, because of the unobservable nature of most subatomic species. Because of this fundamental limitation, subatomic particles can only be detected in an indirect manner, through a detailed examination of how they actually impinge upon their surrounding

environment. Take the ghost-like neutrino, for instance. It is a mysterious subatomic species that: a) travels near the speed of light, b) interacts very weakly with ordinary "baryonic" matter, and c) may or may not have any rest mass. Moreover, since it cannot be directly detected and measured in the laboratory, a variety of indirect means must inevitably be resorted to if anything substantive is to be learned about the neutrino's fundamental nature.

Indeed, this is precisely what particle physicists have done in recent years. They have been able to infer several properties of the neutrino through an indirect style of data acquisition. Working on the assumption that supernova explosions provide the best source of neutrinos for study, they chose to analyze the recent (1987) supernova event in painstaking detail, so as to be able to glean as much information as they possibly could about the neutrino's fundamental nature. Because of the cleverness of their experimental design, along with the general efficacy of this inductive style of reasoning, their efforts were spectacularly successful (although a number of unanswered questions still remain about neutrinos, such as whether or not they actually possesses a rest mass). Remarkably, then, everything we now know about the nature of neutrinos was obtained in an indirect, inductive manner, by circuitously inferring the neutrino's most probable qualities from its general pattern of interaction with the surrounding environment. It is this pattern of interaction that is directly analogous to the observable impact that a creator has on his or her created artifact. For just as we can indirectly discern many of the neutrino's unobservable properties through a careful observation of its impact on other entities that we can observe, so too can we indirectly discern at least some of a creator's inherent properties through a careful examination of the created artifacts themselves. Once again, this is due to the fact that a designer's causal "signature," or imprint, is invariably left behind whenever an artifact is designed and then brought into existence. It is this distinctive imprint that can subsequently be examined for indirect information about the designer's own idiosyncratic nature. It follows, then, that in the same way that we can indirectly infer a great deal of information about the nature of the neutrino without ever having seen one, simply through a careful examination of how neutrinos influence their surrounding environment, so too can we infer a great deal about the nature of God without directly seeing Him or subjecting Him to rigorous experimental analysis. We can best do this by taking a careful, open-minded look at that which the Deity has supposedly made, so we can then ask ourselves what kind of being could have originally been responsible for carrying out such a project. This is the same sort of inductive activity that was advocated by the Psalmist, who confidently proclaimed that:

The heavens declare the glory of God [and] the skies proclaim the work of his hands. Day after day they pour forth speech; night after night they display knowledge. There is no speech or language where their voice is not heard. Their voice goes out into all the earth, their words to the ends of the world. In the heavens he has pitched a tent for the sun, which is like a bridegroom coming forth from his pavilion, like a champion rejoicing to run his course. It rises at one end of the heavens and makes its circuit to the other; nothing is hidden from its heat (Psalm 19:1-6, NIV).

This is a bold declaration that gives a clear stamp of approval to the natural theologian's aims, especially when it comes to the process of inferring the Divine attributes from the nature of the physical universe itself. St. Paul took this idea one step further and asserted that this a posteriori knowledge about God is so painfully obvious that we can't possibly claim to be ignorant about the Creator's existence and great glory: The wrath of God is being revealed from heaven against all the godlessness and wickedness of men who suppress the truth by their wickedness, since what may be known about God is plain to them, because God has made it plain to them. For since the creation of the world God's invisible qualities-his eternal power and divine nature-have been clearly seen, being understood from what has been made, so that men are without excuse (Rom. 1:18-20, NIV, emphasis mine). This passage reveals St. Paul to be the quintessential natural theologian, since he clearly believed that God's "invisible qualities" could be directly inferred from the nature of the physical universe itself. When we attempt to carry out this inductive procedure ourselves in light of our modern scientific understanding of the universe, we find that, contrary to popular opinion, the results strongly support the existence of an Intelligent Designer.

An increasing amount of cosmological data, however, is beginning to show that this popular assumption is most probably false, as is evidenced by the increasing number of atheistic scientists who are converting to some form of theism. For most people, however, it simply isn't enough to establish beyond reasonable

doubt the existence of a generic creative force in the universe. They want to know, to the contrary, what this creative force is really like in and of itself. That is to say, they want to know if it is conscious, all-powerful, benevolent, and whether or not it has any direct relevance to their own personal lives. Unfortunately, we can't directly ascertain these facets of the Divine Being in an empirical manner, because His presumed non-physical nature is not directly amenable to the scientific method. It is, however, indirectly available to us in a derivative sense, as we have seen, and this is more than good enough for our purposes, because we can still discern a great deal about God's most probable nature in this round-about manner.

Do Any of Our Concepts Apply to God?

Of course, the validity of this sort of inductive reasoning can easily be objected to on so-called anthropomorphic grounds, insofar as it isn't necessary for our own concepts regarding the Divine to apply to God's own intrinsic nature. This cynical viewpoint is buttressed by the contributions of modern sociobiology, in which it has been argued that love, purpose, and other human-centered traits evolved, not because they have an independent, non-physical existence, but rather because they have biological survival value, and so were favored by natural selection. Nevertheless, it is important to note that neither of these statements necessarily negate the inferences that we will be making in this paper, even though they may both be true. To the contrary, there is a very real sense in which both of these statements are fundamentally irrelevant to the basic question that is at issue here. For instance, while the cynic can indeed argue that our own values and concepts don't necessarily transfer over to the intrinsic nature of the Godhead, the theist can just as easily argue that there is no necessary reason why they cannot. Indeed, insofar as our own nature is a finite reflection of God's own being, we would naturally expect there to be some direct correlation between our own concepts and God's own intrinsic nature. Moreover, as Alvin Plantinga has aptly pointed out in his intriguing little book *Does God Have a Nature?*, the assertion that none of our concepts apply to God is itself contradictory, since it presupposes that at least one of our concepts, namely the idea that none of our concepts apply to God, itself applies to God.

Further evidence that at least some of our concepts can validly be applied to God (if He exists) can be found in the enormous success of human science. For not only have we been able to crack nature's underlying quantum code, we have also been able to exploit our knowledge for practical (and not-so-practical) engineering purposes. This startling fact tells us in no uncertain terms that for some mysterious reason we do indeed have an inner cognitive connection to the way things really are in the universe. And while this underlying connectivity to the physical universe doesn't necessarily translate over to the spiritual nature of God, it would seem to make such a connection more likely overall, since it tells us that on at least one level we've got intellectual access to the way things we really are in the universe.

A similar criticism can also be applied to modern sociobiological reasoning. For while it may be true that such things as love and purpose have biological counterparts in the physical world, and indeed may have naturally evolved in response to selective pressures, this doesn't necessarily mean that these same properties don't simultaneously exist in the non-physical realm. This would be the case if a divine Creator would have wanted to instantiate certain spiritual traits in the physical world through the gradual process of selection-guided evolution. Indeed, this traditional theistic interpretation of these intangible human concepts seems more probable on the whole than the non-theistic, sociobiological interpretation, because the former seems to offer a much more plausible etiology for their evolutionary development (e.g., God deliberately designed the evolutionary process to bring them about). We must therefore be careful not to be sidetracked by this type of cynical reasoning, even though it could possibly be true. For just as it could possibly be true, it could also possibly be not true. This being the case, we must naturally look to the evidence that is presented by the universe itself in order to determine which alternative is probably the correct one.

A Scientific Interpretation of the Divine Character The first quality that we can justifiably infer about the nature of the Divine Being is that it must in some sense be rational, because the entire visible universe is known to be supremely rational in terms of its basic underlying structure. Although this fact doesn't necessarily prove that God actually exists, it does show that if He exists, then He has to be rational.

This rational quality is also known to extend to the self-conscious creaturely realm as well, because the human thought process itself is also capable of being surprisingly rational, especially when it comes to the mysterious process of deducing how the physical universe itself actually operates. Indeed, it is this very fact that has led many scientists to conclude that whatever else God may be, He has to be a supremely rational entity. Some have even christened Him the "Divine Mathematician" because of this. The pioneering British astrophysicist Sir Fred Hoyle, for instance, sees God as being a genuine "Supercalculating Intellect," and he bases his conclusion on the incredible degree of technological precision that is evident throughout the entire physical realm: A commonsense interpretation of the facts suggests that a supercalculating intellect has monkeyed with physics, as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature. The numbers one calculates from the facts seem to me so overwhelming as to put this conclusion almost beyond question. The foundational science of quantum mechanics is another promising area from which we can glean more scientific evidence about the possible nature of God. As we have seen, the standard "Copenhagen" interpretation of quantum mechanics asserts that there is no such thing as a concrete, determined physical reality as such. Rather, the so-called physical realm actually "exists" in an indeterminate, superpositional state of all quantum possibilities until an observation is actually made upon it, because the intangible phenomenon of conscious observership is believed to be the only means that is capable of collapsing any given combination of wave functions, thereby imparting a "concrete" and determined reality to them.

This raises an obvious problem, though. Prior to the evolution of life in the universe, there were clearly no physical observers in existence anywhere to be able to observe the material universe into being, yet our universe is clearly here nonetheless. So, given the underlying validity of the Copenhagen interpretation (which most physicists readily accept), the universe must have somehow been observed into existence from the very beginning by a transcendent and non-material "Ultimate Observer, who would have both preceded the creation of space and time at the Big Bang, and who would have also observed the entire universe into being as well. This transcendent function, of course, can only be attributed to God, and even Barrow and Tipler have fully acknowledged this possibility, insofar as they have referred to God as the "Ultimate Observer who is in the end responsible for coordinating the separate observations of the lesser observers and is thus responsible for bringing the entire universe into existence." It is in this fashion that we can derive the Divine property of physical transcendence from the (apparent) quantum demand for an Ultimate Observer. But there is even more that we can surmise about the Divine nature from this quantum requirement. For if God actually preceded the existence of the entire universe, then there is a very high probability that He must be an eternally existing being. This inference is strongly supported by the realization that any being who is transcendent enough to be able to precede the Big Bang must also be transcendent enough to be eternal. But we can even go one step further than this. For if God is actually eternal in this manner, then there is also a very good likelihood that He is probably self-existent as well. This can be seen to follow directly from the very supposition of an eternal lifespan, because a being who has existed from all eternity would by definition have to be uncreated, which in turn implies that He must have eternally been deriving His existence from His own necessary nature. This of course is the property of self-existence in its simplest form, and it can be seen to follow necessarily from God's own eternal existence.

It is also possible to derive the transcendent nature of God's existence from His unique position as Creator as well. For if He really did bring the whole spatio-temporal realm into existence at the Big Bang, then it follows that He must be genuinely transcendent over the entire physical domain. Further support for God's transcendence over the physical realm can be found in the multi-dimensional nature of the universe itself. Interestingly enough, all workable theories of particle physics that aim for a conceptual unification of nature's four fundamental forces require the existence of at least nine dimensions immediately following the Big Bang in order to be operational, yet we now only have four observable dimensions remaining in existence (three of space and one of time). Modern string theory, for instance, predicts that the universe came into existence with either ten or twenty-six different dimensions, but it also predicts that soon after the creation all but four of them shriveled up and essentially disappeared. The astronomer Hugh Ross, however, believes that these higher dimensions still exist somewhere in the universe, but on a level that is imperceptible to humans. He also believes that they are capable of providing a plausible avenue through which God can display much of His transcendence over the world: The Bible declares forthrightly that God

is very close to each and every one of us. But, it just as forthrightly states that God is invisible. The Apostle Paul says that no one has ever seen God, nor can see Him. Evidently, it is impossible for us humans to make physical contact with God. How, then, can God be so close and yet be beyond physical contact? Ross finds the answer to this question in the multi-dimensional nature of our physical universe, which enables God to be both far beyond us, and yet right next to us, simultaneously. "It boggles the mind," Ross tells us, "to try to conceive of what can happen in seven more dimensions of space and time than we humans can experience." These extra dimensions, according to Ross, enhance God's transcendence by enabling Him to carry out virtually any imaginable activity in the world that isn't logically contradictory. While this may or may not be true, it is true that these higher dimensions probably exist somewhere, and it is their mere existence that most interests us here, because it illustrates quite conclusively that physical channels already exist for some degree of transcendence over our ordinary, four-dimensional spatio-temporal realm. This indicates that the concept of physical transcendence isn't unrealistic or implausible in and of itself, especially given the fact that these higher dimensions are directly posited by most modern particle theories. Of course, these higher dimensions are still part of the physical domain, so they aren't necessarily indicative of any absolute degree of transcendence in and of themselves. But who knows where they could lead? For all we know, they lead directly to the transcendent spiritual realm. But even if they don't, they have still set an important precedent in the universe; namely, that we now know that concrete physical pathways exist in the universe which lead in the general direction of physical transcendence.

But if this is so, it would seem to make it more likely, on the whole, that a much higher degree of transcendence probably exists outside of our physical plane of existence altogether. This makes sense when we realize that the very concept of physical transcendence automatically places this transcendent realm utterly beyond our present world, which in turn makes it highly unlikely-if not downright impossible-for us to ever be able to detect it from a purely physical vantage point. On the other hand, we're still not sure how much of our minds are truly spiritual in nature, or, for that matter, how far they might be able to penetrate into the transcendent spiritual world. It is certainly conceivable that we could, qua spiritual beings, gain entry into this transcendent realm from time to time, but even if we can't, we still have good scientific reason for believing that some degree of physical transcendence probably exists in the universe.

We mustn't forget that the very concept of transcendence is implicit in the nature of the Big Bang itself, because prior to our present universal expansion there was no such thing as space, time, or matter, which means that our physical universe was physically transcended by definition before the Big Bang actually took place. This follows necessarily from the Space-Time Theorem of General Relativity. So we know that it is indeed possible that something wholly other than the present spatio-temporal realm can actually exist, but if it could have existed prior to the Big Bang, then it also could be existing right now in another domain of existence that totally transcends our own. This concept of transcendence is also important for our purposes because we can derive the spiritual nature of the Divine substance directly from it. For if God truly pre- ceded the creation of the entire spatio-temporal realm, and is utterly transcendent over it, then it follows that He cannot be merely a physical being by definition.

We can also derive the property of omnipresence from the Creator's transcendent cosmic position as well. For insofar as this Being really did contrive the Big Bang from a transcendent position over the universe, then it follows that He must be transcendent over the entire spatio-temporal realm, which means that He must be genuinely omnipresent. Certainly He is everywhere the physical universe is according to this view, because the entire Big Bang has somehow been incorporated both under and within His transcendent existence. This conclusion is strongly supported by God's own non- physical nature, as it is much easier to see how a non-physical Being, as opposed to a purely physical one, can be omnipresent over the material universe in this nonlocal and timeless manner.

The omnipresence of God can also be inferred from the nonlocality of physical relations within the universe. For as David Bohm, George Bell, and others have argued, the universe is an undivided whole that can somehow transmit information instantaneously (and therefore faster than the speed of light) from one end of the universe to the other. In order to be possible, this bizarre finding of modern science requires that the contents of the entire physical universe be linked together into a single unified whole. We can infer the existence of three Divine attributes from this phenomenon of quantum nonlocality. First and foremost, we

can see that insofar as this characteristic of nonlocality accurately reflects certain aspects of the Divine nature, then God must be One, because the entire universe is now known to be linked together into a single unified whole. Paradoxically, though, this also requires God to be omnipresent as well, because the very concept of nonlocality presupposes an omnipresent, coordinating force that is time-independent. Time-independence is required here because nonlocal relations are now known to be instantaneous in nature, even when they transpire on opposite ends of the universe. It follows from this that God must in some sense be timeless as well, since He would have been responsible for creating this particular feature of the cosmos. The timelessness of God can also be deduced directly from God's presumed transcendence over the physical universe. Prior to Einstein's theory of relativity, it was very difficult to see how God could transcend the ordinary confines of time. But now we know that time isn't an absolute physical "thing" at all. It is, rather, a supremely elastic quality, that can be stretched or squeezed in direct response to such relativistic items as one's velocity and one's overall proximity to a gravitational field. But if this is true for us mere mortals, then how much more true must it be for the transcendent Creator of the cosmos, who actually created time at the Big Bang, and who thus exists outside the ordinary confines of time altogether? No wonder the Psalmist could say that "a thousand years in your sight are like a day that has just gone by, or like a watch in the night" (Psalm 90:4).

Indeed, God's transcendent position over time can be seen to be implicit in the Biblical assertion that "God is light" (1 John 1:5), as we have seen. For if we take this statement to be physically analogous to God's true spiritual relationship to the temporal sphere, we find that He must be timeless after all, since according to Einstein, anything that travels at the speed of light is inherently timeless by definition. This relation also contains the physical analogue to God's omnipresence as well, because anything that travels at the speed of light must also have an infinite mass, which is the very thing that an omnipresent being would have if it were physical in nature! But the Bible doesn't tell us that God merely travels at the speed of light; it rather tells us that He is light. This can be understood to mean that He represents the very essence of timelessness and spiritual omnipresence. So we see that even Einstein's theory of relativity is able to give us important scientific information about God's most probable nature.

In fact, given the transcendent degree of intelligence that is exemplified throughout the physical universe, there is also a very high probability that the Creator must be omniscient as well. We can say this for the simple reason that any being who is wise enough to have created our exceedingly complex universe perfectly from the very start-as the most recent cosmological data clearly indicates-is also likely to be all-knowing as well, because it is very difficult to see how such an impeccable cosmic masterpiece could possibly have been the result of anything less than a veritable infinitude of knowledge.

This intuition can be readily verified by even a cursory glimpse into any natural science textbook, whether it be in the field of neurophysiology or quantum mechanics. For as Newton realized long ago, we have only scratched the surface of any complete knowledge of how our universe actually operates; yet, this minuscule inkling has nevertheless turned out to be outrageously complex. In fact, it represents a level of technological expertise that so completely and totally outstrips our own that we can safely call it essentially infinite in scope.

While this may seem to be a questionable leap to take, it can largely be justified on a probabilistic basis. Physicists frequently do this when they come across a physical quantity that is very steeply peaked around zero. When this happens, they tend to regard the quantity in question as being precisely zero; that is, until it can be shown to be otherwise. A good example of this process can be found in the infamous cosmological constant, which turns out to be very steeply peaked around zero when it is measured in a low-energy world similar to our own. As a consequence, most physicists tend to regard the cosmological constant as being precisely zero.

In the same way, we have good reason for supposing that the extreme degree of intelligence that is exemplified by our universe is actually infinite in nature, because everywhere we look, from the smallest subatomic region to the most distant nebula, we find the same unfathomable degree of intelligence and complexity staring us in the face. Moreover, there is every indication that we have only obtained a tiny glimpse of the actual amount of intelligence that pervades the cosmos. But if this is so (i.e., if the native

degree of intelligence in the universe is so overwhelmingly peaked toward infinity that we can't even begin to comprehend the peak's true height), aren't we justified in assuming that, for all practical intents and purposes, it must be essentially infinite in scope?

Of course, this doesn't necessarily mean that an infinite degree of complexity must exist, just because we, in our humble finitude, are unable to grasp it all. But what it does mean is that practically speaking, there is essentially an infinite amount of intelligence remaining to be discovered in the cosmos. And if this is essentially the case, then it could very well end up being actually the case, especially given the fact that we are already familiar with the endless arrays of complexity that adorn each and every one of the natural sciences. But if this is so on a small scale, then it would seem to follow that it will probably end up being true on a large scale as well, because the principle of universality-which states that the same general scientific principles are true throughout the universe-assures us that it must be so. If nothing else, we can assert with confidence that there are an infinite number of important mathematical relations "out there" waiting to be discovered. And since each of these relations by definition represents a small amount of cosmic intelligence that is waiting to be grasped and understood, it follows that the universe must necessarily possess an infinite degree of intelligence after all. This is no trivial realization, because a significant proportion of these undiscovered relations undoubtedly pertain to actual states of affairs somewhere in the universe. But a "significant proportion" of infinity is itself infinite in scope, so it follows that there is most likely an infinite number of cosmic states of affairs in existence that are waiting to be discovered. This conclusion is supported by the growing realization that the physical universe itself is infinitely complex in terms of many of its basic underlying features. It is hard to see how this feature of cosmic reality could possibly be consistent with anything other than an all-knowing Creative Force. For as I pointed out in God and the New Cosmology, it would seem to be a general metaphysical principle that any aspect of the physical universe that requires a certain amount of intelligence to understand must have originally required at least as much intelligence to initially bring about. This much only stands to reason, but this realization nevertheless has extremely far-reaching implications for us, because it means that our universe had to have originally been created by a Mind that naturally transcends our own intellectual capacities by a truly unfathomable amount.

On the other hand, there is no necessary connection between the universe's inherent degree of complexity and the amount of knowledge that is possessed by God; nor is an omniscient Creator under any sort of compulsion to create a physical universe that directly reflects His own unlimited degree of understanding. To the contrary, He could very well have chosen to create a finite universe which displays merely a finite amount of knowledge. Hence, the natural theologian is not committed to the idea that the physical universe must display an infinite amount of knowledge and complexity. At the same time, though, he or she is aware of the fact that the universe does indeed seem to display this sort of endless complexity in many of its different facets; and furthermore, that insofar as this is actually the case, it can be seen to provide a direct reflection of the Creator's own unlimited storehouse of knowledge and understanding. While we're on the subject of infinities, now would be a good time to consider the prospect of Divine omnipotence. Is there enough scientific evidence to justify the conclusion that God is infinitely powerful? If not, how much power can we justifiably attribute to Him merely through an impartial reading of the scientific evidence? Although these are clearly very difficult questions to address purely from an empirical point of view, we can nevertheless confidently assert that, given the unbelievable size and age of our universe, along with the utter grandeur of the countless celestial objects it contains, the Creator must be an exceedingly powerful force indeed. But it is one thing to say that He is exceedingly powerful and quite another to say that He is infinitely powerful. But here too we can find considerable support for the traditional doctrine of omnipotence from the findings of modern science. For according to cosmologists, the expansion of our universe can be traced back in time to a point when the entire universe was smashed into a point that was infinitely hot and infinitely dense. This much alone is remarkable enough, but we're also told that this infinitely dense "cosmic egg" was somehow very precisely manipulated so as to enable it to eventually lead to our present biocentric universe. This in turn leads us to ask a very pertinent question: what kind of being or force could have created such an infinitely hot and infinitely dense superparticle, and then have miraculously transformed it into our glorious, life-supporting universe? Now, it would seem that, in any attempt to come up with a sufficient explanation for a given phenomenon, we must always posit a creative force that is entirely sufficient for the task being demanded of it. This being so, we seem to be constrained,

by the very grandeur of the task being proposed, to posit a universal Creator who is infinitely powerful, because no less of a being could possibly have created such an infinitely hot and infinitely dense particle in the first place. Indeed, this would seem to follow necessarily from the infinitude of the cosmic singularity itself, because it is a metaphysical principle that no effect can be greater than its initial cause. Insofar as this is actually the case, it necessarily follows that the cosmic creative force had to have been at least as powerful as the infinitely hot and infinitely dense singularity that it brought about, and this, in turn, demands an infinitely powerful creative force. No wonder the astronomer John Barrow could assert that "the role of the Creator is essentially assumed by the naked big bang singularity."

This situation is not unlike the time-honored conundrum concerning whether or not an omnipotent God is powerful enough to create a rock that is too big for Him to lift. While this may or may not be so (it may simply be incoherent), there is in fact one thing about this situation that we can say with a fair degree of certainty: namely, if God is going to create an infinitely big rock, then He has to be infinitely powerful Himself, at least in some capacity. This much only stands to reason. But an infinitely dense singularity is in point of fact infinitely "massive" in an inverse sort of way, so it would seem to follow that the infinitely dense singularity that gave rise to our universe had to have been created by an infinitely powerful Deity. It is in this fashion that the traditional doctrine of omnipotence, long an issue of bitter debate amongst theologians, can be justified purely from a scientific point of view. This conclusion is corroborated by additional findings from the realm of cosmology, which indicate that the universe was perfect in a structural sense from the very beginning, at least in terms of the calibration of its most fundamental, life-supporting parameters. It was this initial perfection that, against all the odds, enabled our fledgling universe to bring about intelligent life several billion years later. This realization is all the more astonishing when we realize that many of these initial conditions had to have been exceedingly fine-tuned before the universe could have ever had this curious biocentric effect.

Consider, for instance, the accuracy of the so-called "density parameter," which was responsible for determining the initial explosive vigor of the Big Bang, and which had to have been fine-tuned to better than 1 part in 1060 before life could have ever been capable of evolving on this planet.

Or what about the value of the mysterious vacuum energy or cosmological constant, which seems to have required a stupendously precise cancellation effect to obtain between different contributing influences to the vacuum energy before it ever could have arrived at its present life-supporting value? Incredibly enough, we now know that this cancellation effect would have needed to be accurate to an unbelievable 120 decimal places before an appropriate life-supporting space could have been duly generated in the universe. Steven Weinberg is equally impressed with the unprecedented extent of this fine-tuning:

Opinions differ as to the degree to which the constants of nature must be fine-tuned to make life necessary. There are independent reasons to expect an excited state of carbon 12 near the resonant energy. But one constant does seem to require an incredible fine-tuning: it is the vacuum energy, or cosmological constant, mentioned in connection with inflationary cosmologies. Although we cannot calculate this quantity, we can calculate some contributions to it (such as the energy of quantum fluctuations in the gravitational field that have wavelengths no shorter than about 10⁻³³ centimeter). These contributions come out about 120 orders of magnitude larger than the maximum value allowed by our observations of the present rate of cosmic expansion. If the various contributions to the vacuum energy did not nearly cancel, then, depending on the value of the total vacuum energy, the universe either would go through a complete cycle of expansion and contraction before life could arise or would expand so rapidly that no galaxies or stars could form.

Thus, the existence of life of any kind seems to require a cancellation between different contributions to the vacuum energy, accurate to about 120 decimal places. In other words, the expected value of the cosmological constant has turned out to be many orders of magnitude smaller than it was "supposed" to be, based on the so-called Standard Model of particle physics. According to this conceptualization, the physical universe is made up of a large number of "free parameters," or distinct structural components, that work together to comprise our coherent, life-supporting universe. Yet, because this Standard Model explicitly rejects any sort of Intelligent Design in the nature of these components, physicists believe that they therefore must be completely independent of one another, which in turn would mean that they most

probably originated totally apart from one another as well. They therefore have little choice but to conclude that it was only by the most unlikely of accidents that these components were later able to work together to form a coherent universe. Based on this assumed independence of the universe's most fundamental building blocks, physicists have calculated the "proper" size for the cosmological constant, and what they found is nothing short of amazing. They came up with a value that is over 10^{46} times larger than the value that they actually measured. This is of paramount significance, for if the cosmological constant were truly this large, the geometry of space-time would be so warped that no form of life would be capable of existing. Our lives are therefore profoundly dependent on the cosmological constant's unexpectedly small value, yet physicists are at a near total loss to explain why this should be so. As physicist Larry Abbott of Brandeis University explains: The stupendous failure we have experienced in trying to predict the value of the cosmological constant is far more than a mere embarrassment. Recall that the basic assumption we used to obtain our estimate of the value of the cosmological constant was that there are no unexpected cancellations among the various terms in the sum determining the total energy density of the vacuum. This expectation was based on the assumed independence of the free parameters of the Standard Model. Clearly, this assumption is spectacularly wrong. There must in fact be a miraculous conspiracy (emphasis mine) occurring among both the known and the unknown parameters governing particle physics, with the result that the many terms making up the cosmological constant add up to a quantity more than 46 orders of magnitude smaller than the individual terms in the sum. In other words, the small value of the cosmological constant is telling us that a remarkably precise and totally unexpected relation exists among all the parameters of the Standard Model of particle physics, the bare cosmological constant and unknown physics. This is an extraordinary observation that suggests a hidden level of cooperation-or Abbott calls a "miraculous conspiracy"-between the many different structural components that make up the physical universe. This cooperation appears to be directed towards making the cosmological constant small enough to be compatible with the existence of a life-supporting universe.

This kind of multi-level cooperation between so many seemingly "independent" factors is just what we would expect if the universe were deliberately designed by an Intelligent Power. I say this for three different reasons: 1) because of the number of distinct parameters that are involved, 2) because of the many complex interconnections that exist between these parameters, and 3) because of the overall purpose of this grand cooperative scheme (that of making space-time "flat" so it can be conducive to life). To his credit, Abbott doesn't even attempt to attribute this interdependence to chance; rather, he openly assumes a non-accidental origin to the cosmological constant, because it is the only conclusion that is consistent with such a profound degree of fine-tuning. It is hard to make sense of this fine-tuned orchestra of free parameters apart from the traditional theistic idea of an omnipotent Designer. While it might be possible to imagine alternative scenarios in which this fine-tuning might have been able to obtain accidentally (perhaps through a random varying of the constants throughout different regions of the universe), none of these question-begging alternatives is as simple or as conceptually satisfying as the traditional theistic explanation, since none purport to explain where the universe itself could have originally come from. There is also no evidence whatsoever for any type of varying of the physical constants. To the contrary, the empirical evidence overwhelmingly indicates that the constants themselves have probably occupied their present life-supporting values from the very beginning. As a consequence, natural selection is not believed to have been involved in the initial calibration of these fundamental parameters. What this means as far as we're concerned is that the universe has actually possessed its present biocentric character from its very inception, which again only seems to make sense in terms of an all-powerful Designer, because any force that is capable of coercing the initial conditions of the universe so perfectly from the very beginning is probably capable of doing far more, and this possibility only seems to be consistent with an unlimited degree of creative power. When this realization is considered in light of the apparent fact that only an infinite creative power could have possibly brought forth an infinitely hot and infinitely dense superparticle out of nothing, then the prospect of Di-

vine omnipotence would seem to be virtually certain. But we can take this line of argument one step further, because we all know for a certainty that many interesting products actually emerged from the Big Bang (namely ourselves and the rest of the biosphere). While this doesn't necessarily prove that organic life forms of some sort were deliberately intended from the very start, this would nevertheless seem to be the

most probable conclusion, given the fact that these products actually obtained, and the fact that a supreme amount of intelligence and power was necessary to enable this to happen.

The basic idea here is that any creative force that is this intelligent and this powerful was, in all likelihood, more than competent enough to have actually intended the evolution of life all along. This is a very reasonable inference to make, and it is one that seems to be indicative of some type of deliberate conscious intentionality in the universe. But only self-conscious, free-willed personal beings are said to be capable of deliberately intending to do anything. Therefore, this Divine creative force is most probably a self-conscious, free-willed, personal Being as well. Even here, though, there is more than initially meets the eye, because any cosmic force that is conscious and powerful enough to have deliberately intended the evolution of life from the very beginning is also likely to have been driven by feelings of love and caring for His creation, because the entire universe seems to have been lovingly crafted at least partially for the sake of earthbound life forms. This is directly evidenced by the unsearchable degree of complexity that is displayed at all levels of cosmic reality, which itself seems to indicate how far God's love for us actually extends, since we clearly wouldn't even have a world to live in apart from this physical complexity.

This is the same inference that would be drawn by a quadriplegic child, whose father had lovingly chosen to build her an extremely elaborate home to live in which would cater to her every handicapped need. The very depth of complexity that would inevitably be involved in such a project would clearly be indicative of the father's profound love for his daughter. And, in the same way, we can interpret the profound scope and complexity of the entire physical universe as a direct sign of how much God must have truly loved us, especially since each and every aspect of this complexity seems to have been necessary for our own existence.

We also know the physical universe to be an immensely beautiful place as well, where breathtakingly gorgeous scenes can be found in almost any direction one happens to look. This natural beauty does not appear to be an idiosyncratic perception of our own minds, because the celestial bodies that comprise it exist independently of us, and are awe-inspiring in their own right. Now, insofar as this is indeed the case, it follows that God must possess a heightened sense of aesthetic awareness, because any created object can only be as beautiful as the artisan who ultimately gave rise to it. This elementary principle of creativity tells us that the Divine sense of beauty must be very profound indeed. Hugh Ross agrees:

Observe skilled sculptors, painters, or poets, artisans of any kind, and see that they always spend much more time on their masterpieces than they do on their ordinary tasks. Observe the pains-taking yet joyful labor poured into each masterpiece of their design. Observe how often the artist stops to appreciate and evaluate the work in progress. Examine the creation on any scale, from a massive galaxy to the interior of an atom, from a whale to an amoeba. The splendor of each item, its beauty of form as well as of function, speaks not of instantaneous mass production but rather of patient attention to detail, of infinite care and delight. Such delight with work in progress is expressed through Genesis 1 in the oft-repeated statement, "And God saw that it was good." This brings us to the important property of omnibenevolence, which refers to the totality of good that is supposed to be characteristic of the Divine Being. Interestingly enough, this property can also be directly inferred from the observed nature of the present universal structure, because there is no question that the conditions on this planet are unreservedly "good" as far as the existence of life is concerned. Everything we need for our physical sustenance is readily available in our earthly habitat, from a suitable oxygen supply to the correct amount of sunlight and the proper nutrients for our organismic well-being.

This biocentric quality becomes all the more apparent when we consider the fact that almost all of the visible universe is exceedingly hostile to the needs of life, since any given area of the universe is either too hot, too cold, too barren, or otherwise unable to support the delicate needs of carbon-based life forms. But the earth is different-and perhaps even unique-in this life-supporting capacity, because it lovingly caters to our needs in thousands of different ways. This fact is surely "good" for us, which in turn means that any Divine force that would have consciously intended for us to exist here must also be "good" in this instrumental sense as well, because a good agent is almost always required to produce a good effect. Indeed, this goodness becomes amplified many times over when we realize how delicately balanced our

world really is, vis-à-vis the many fine-tuned constants and other parameters that were initially required for our existence. Each and every aspect of this profound biocentric precision speaks directly of the goodness of the force that originally produced it, as we would realize only too well if we could be transported to the surface of Venus or Mars for a few seconds.

Indeed, the goodness of the earth becomes radically apparent when we compare the conditions here with those of any other celestial locale in the entire known universe. These other worlds would actually be worse for us than a pre-designed hell, because we wouldn't even be capable of surviving anywhere else, not even for a few fleeting seconds. No wonder the book of Genesis repeatedly states that God saw His creation to be "very good" (Gen. 1:11, 12, 18, 21, 25, 31). The Empirical Probability of our Inferences Earlier we saw how the inductive form of reasoning that we've been using throughout this paper yields only probable answers. This being the case, how can we be sure that our conclusions stand a good chance of actually being true in the real world? Norman Geisler and Ronald Brooks, in their excellent book on the structure of logical thinking, describe four general ways in which we can determine the empirical probability of any inductive conclusion. First and foremost, they tell us that we have to take into consideration the breadth of our sample. Larger sample sizes are obviously associated with the most probable conclusions, because there is a much greater likelihood that we will be able to draw accurate inferences when we're working with a large sample size. On this score, the traditional theistic conclusions that we have drawn in this paper stand a good likelihood of actually being true, because our sample size is actually the entire universe. Of course, there can't be a larger sample size than the whole cosmos, and while this doesn't guarantee that our inferences will be accurate, it does make this accuracy more probable, on the whole.

The second way that we can establish the empirical probability of a given conclusion is similar to the first, in that it has to do with how representative the evidence under consideration happens to be. In our own case, the evidence is about as representative as it could possibly be, because once again we're dealing with the evidence of the entire universe. For instance, we can safely infer certain logical conclusions from the orderly nature of the universe because a very high degree of order has in fact been discovered to exist everywhere we've looked.

The third method of establishing empirical probability, according to Geisler and Brooks, questions how carefully the evidence itself has been examined. In our case, we can see that the evidence has been very carefully examined, both by physical scientists and by our own carefully weighed interpretation of their findings. Indeed, as long as we accept the existence of some type of supernatural Creator, we see that none of our inferences about His underlying nature appear to be patently unreasonable. To the contrary, given the intrinsic persuasiveness of the physical evidence itself, the majority of our inferences seem to be very strongly called for. Brooks and Geisler's fourth and final method of establishing empirical probability questions how the information that has been gained relates to the body of knowledge that has already been attained in the area under consideration. It is at this point that our theistic conclusions can be seen to have a very high degree of empirical probability associated with them, because all of the analogies that we have used between artisans and their artifacts are definitely known to hold true in the realm of human creativity. In this sense our inferences are known to correspond in a direct, one-to-one fashion with virtually the entire body of knowledge on creativity that has already been attained. Of course, there is no guarantee that our analogies will necessarily apply to God. But, to the extent that our universe has in fact been created by some type of Intelligent Designer, the analogy with human creativity would seem to hold, because the creative process itself is fairly simple and straightforward in terms of its underlying fundamentals, whether the creator in question is human or Divine. Therefore, as long as we deem that some type of universal Creator probably exists, then the various inferences that we have drawn about His underlying character attributes would seem to have a very high empirical probability of being accurate in the end, because they have satisfied all four of Brooks and Geisler's independent criteria for establishing empirical probability.

Conclusion

In this paper we have been able to make a number of important, scientifically justified inferences about the nature of the Divine Power. This is significant, because it gives a substantial degree of scientific credibility to our view of the Godhead. As it turns out, this scientific interpretation of the Divine nature ends up being

virtually identical to the traditional theistic view, insofar as it indicates that God, insofar as He actually exists, is most probably omniscient, omnipresent, omnibenevolent, self-conscious, supremely personal, and all-powerful. For many modern minds this may be a truly breathtaking conclusion to have to contend with, because it stands in stark opposition to what we've been taught throughout our academic lives.

Nevertheless, we shouldn't be surprised by this realization, because a universe that is truly holistic in nature is by definition capable of giving up her secrets in numerous ways. This would seem to explain why the ancient Hebrew prophets were able to ascertain a surprising amount of universal truth in a non-empirical manner, just as we are using another method—namely, the technique of modern science—to tap into this very same reality. This being the case, we should have actually expected this exciting theoretical convergence between science and religion all along, for insofar as the universe is truly a single, undivided whole, as we're being told by an increasing number of physicists and cosmologists, then this should mean that a scientifically "ignorant" person living three thousand years ago should have nevertheless been able to tap into the same cosmic reality that modern particle physicists today are routinely delving into. This would explain why the text of Genesis One seems to be so scientifically accurate, and why so many of the predictions of the ancient Hebrew prophets have actually turned out to be correct. For as long as there is a single unified reality in existence, it should be possible for people living at different times to come to an accurate understanding of the universe despite their historical limitations.

The upshot here is simply that our understanding of the Divine Essence needn't be contradicted, opposed, or otherwise limited by the empirical nature of the latest scientific evidence. Rather, it should be greatly bolstered by these scientific revelations, since they end up supporting the validity of our traditional view of God in virtually every relevant capacity.

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Paul Davies, *God and the New Physics*, p. 234. From a presently unpublished manuscript by Kevin Sharpe, Chapter 16, pp. 6-7. John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle*, p. 12. *Ibid.*, p. 5.

Hawking and Penrose,

M.A. Corey, *God and the New Cosmology* (Lanham, MD: Rowman and Littlefield, 1993). I am intending my use of the word "designer" here to be synonymous with the word "creator," although technically speaking the designer of a given artifact doesn't have to be identical with its creator.

I am not using the male personal pronoun in relation to God in order to indicate anything specific about the nature of the Deity, at least at this point in our discussion. I am merely utilizing it at this point for the sake of literary convenience, although later in this paper I will be using it to indicate that God is most likely a personal Being.

Norman L. Geisler and Ronald M. Brooks, *Come, Let Us Reason*, p. 133. Paul Davies, *The Last Three Minutes*, pp. 39-41. M.A. Corey, *God and the New Cosmology*, pp. 123-173, 202, 246, 287-291.

Alvin Plantinga, *Does God Have a Nature?* (Marquette University Press). Human rationality is surprising in three distinct ways. First, we are the only physical beings we know of that possess this trait, so we are clearly in possession of an extremely rare commodity. On a probabilistic basis alone, then, we should be surprised to find that we are in fact rational beings. (From a tautologous "weak anthropic" point of view,

though, we shouldn't be surprised at all that we are rational beings because we already know that we are.) Secondly, we have absolutely no idea how and why our brains operate in this mysteriously rational manner. And thirdly, there is no way to explain the origin of this curious property apart from the activity of a larger Creator. The fact that it ultimately facilitates survival can't be considered to be a valid explanation, because it begs the true question that is at issue here, which concerns where the original propensity for this trait ultimately came from.

Fred Hoyle, "The Universe: Past and Present Reflections," *Engineering and Science* (November, 1981), pp. 8-12. John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle*, p. 470. The Space-Time Theorem of General Relativity, due to Penrose, Ellis, and Hawking, specifies that time, space, and matter all came into existence at the Big Bang (Hugh Ross, *The Creator and the Cosmos*, p. 67).

Ibid., p. 148.

John D. Barrow, *The World Within the World*, p. 195. Hugh Ross, *The Creator and the Cosmos*, p. 149. *Ibid.*, p. 150.

In speculating about what could have come "before" the Big Bang, I am not contradicting the idea that space and time actually came into existence during that primordial blast, because I am locating my question, not in the spatio-temporal realm itself, but rather in the transcendent spiritual realm. For if God is indeed eternal in nature, then there is a very real sense in which He did indeed exist "before" the Big Bang, even though He presumably exists outside of the ordinary constraints of time altogether.

M.A. Corey, *God and the New Cosmology*, pp. 249-257. Actually, we shouldn't be unduly intimidated by the prospect of an all-knowing Deity, because the concept of infinity isn't as intangible and abstruse as we often like to believe. After all, many of us manipulate real infinities all the time without batting an eye, and even a young child can hold an infinite number line in her hand without much ado. Of course, these are merely symbolic representations of infinity, but they are nonetheless infinite—one doesn't have to have every single number in an infinite series "on board" to be able to profitably manipulate infinities. But the important thing to keep in mind here is that if we, being finite, can conceptualize the idea of infinity so effectively and can even manipulate different infinities to our advantage, then is it so hard to believe that the transcendent Creator of the universe can actually be omniscient? The physicist Frank Tipler has even gone so far as to postulate that we will one day be able to collectively obtain infinite knowledge at the Omega Point, even though we are clearly finite beings individually. How much easier, then, is it to believe that God, being spiritually immortal, is also probably omniscient as well?

John D. Barrow, *Theories of Everything*, pp. 147-148. F. David Peat, *The Philosopher's Stone*, pp. 164-166. M.A. Corey, *God and the New Cosmology*, p. 217. It is ironic that we tend to be so impressed when a magician pulls a rabbit out of a hat, but when we're told that the entire universe was "pulled" out of nothing at all, we hardly sit up and take notice!

John D. Barrow, *The World Within the World*, p. 315. John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle*, p. 288. John Gribbin and Martin Rees, *Cosmic Coincidences*. Steven Weinberg, "Life in the Universe," *Scientific American*, Vol. 271, No. 4, October, 1994, p. 49. *Ibid.*

The Standard Model of particle physics attempts to describe all the known elementary particles and their interactions in terms of fields.

Larry Abbott, "The Mystery of the Cosmological Constant," *Scientific American*, Vol. 3, No. 1, 1991, p. 78. John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle*, p. 288. *Ibid.*

M.A. Corey, *God and the New Cosmology*, pp. 249-257. Hugh Ross, *Creation and Time*, p. 142.

Of course, there is also a tremendous amount of evil in our world that doesn't seem to square with this presumed theological goodness, but this is only true as long as we insist on myopically viewing our existence from the smallest and most rigid perspective possible. If we take a step back, though, and try to examine the essential nature of human life from a developmental, task-oriented perspective, things begin to look much different, especially when we take the probable existence of an Afterlife into account. I say "probable" here because if some type of Divine Creator Being does in fact exist, then the odds are very good indeed that an Afterlife will also simultaneously exist. This would be advantageous for the theodist, because it would give God an additional realm of existence to make sure that evil gets properly resolved. (For a much more in-depth treatment of the problem of evil from this traditional theistic perspective, please refer to my book *Job, Jonah, and the Unconscious: A Psychological Interpretation of Evil and Spiritual Growth in the Old Testament*.)

Norman L. Geisler and Ronald M. Brooks, *Come, Let Us Reason*, p. 137. *Ibid.*

Ibid.

Ibid., p. 138.

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