

EVIDENCE FOR THE EXISTENCE OF GOD

by

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I. INTRODUCTION

Throughout the years of philosophical and religious history, we have witnessed a battle on what could rightly be the most important topic to transcend the annals of history: The existence of God. Perhaps no greater issue is debated today than that of the probability of God's existence. The approach we take on this most basic of philosophical issues molds the subsequent world view of the person holding an opinion on the existence of God. Quite naturally, there are those of us who favor the existence of God and see such an issue paramount to a Christian faith. But there are other competing beliefs about God's existence that call such conclusions into question. With the inclusion of reasonable inquiry into contemporary debates over the existence of God we find ourselves defending a fundamental assumption about who is or is not at work in our universe. I must rejoice over the progress since the Rationalistic Nineteenth Century as we have now rightly granted the readmission of reason back into the polemic of God's existence. This is indeed headway. Previously, far too many Christians and non-Christians have given up the fight to declare whether or not God exists (and in some cases have avoided the question altogether). But since we have traveled the theistic road of fideism and the non-theistic paths of naturalism and positivism we have now found ourselves asking the same questions all over again. This may imply that our readmission of reason back into faith is an unavoidable phenomenon and that reason is rightly regarded as the handmaiden *to* faith.

You may be asking yourself "Why is it that the existence of God has become an issue when such a struggle antedates even the earliest philosophical thinkers?" and "Why have we bothered to come full circle on this issue only to end up repeating ourselves?" The answer is literally as old as time. There is no doubt that our concession of God's existence or our denial of such defines our perception of how the world operates and sustains a foundational plateau. In other words, how we answer the question "Does God exist?" will tell us what our world view will encapsulate. Let me illustrate this by means of analogy. If we believe that goblins make us do everything that we do, then we would have, admittedly, a peculiar world view. But this world view would imply all sorts of interpretations for the real world. For example, numerous individuals who were and are on death row would be there for crimes they are not guilty of (since the goblins are the constraining causal agents of their actions). Similarly, no beautiful work of art would be the production of the artists whose name appears in the corner or no great work of philosophical history would be the product of those whose names are contained therein. Instead, we would have to attribute every human action to the mysterious goblins behind the intellects. Now, nobody seriously considers this analogy as a truth about the world. But it serves to illustrate how we *view* or *interpret* the world we all share and enjoy. Now consider something. You have just read an analogy that you found to be an imaginary piece of fantasy used to

illustrate a point. But did you stop to think that due to *your* world view you were making judgments about the goblins of intellectual causation? Now, goblins driving the human intellect is one thing but the existence of God entails an entirely different interpretation on our world. As Christians, we suspect that a Creator freely created either in time or timelessly the universe in which we live. If you are a professing Christian, you no doubt look forward to the time when you will rejoin God to see Him intimately as a loving God who guided you through your years on earth. As a creation of God you see yourself as an individual who has strived to know God and to commune with Him. If you are an atheist or an agnostic, then you would perceive an entirely different world view. Your world view makes no individual person the product of any transcendent Being. You see the universe and everything in it simply as the cosmic furniture in which we find our existence. How an atheist or agnostic lives her life is truly a matter of personal desire and self-defined temperance. In any case, the mixture of the two views is clearly like oil and water.

In this essay, we shall consider the role that reason has with the Christian faith and how reason compels us to a belief in God. The particular line of reasoning we will be focusing on is in the *kalam* cosmological argument in its deductive mode. After we see this argument, we will examine its strength in light of contemporary criticism and we will see if God really does exist as so many Christians have testified.

2. FAITH AND REASON

Now that we have seen how God's existence defines our world view, we need to begin examining our approach to sharing with others how we can know if God exists. How does a Christian ultimately know that God exists? She knows from the personal testimony of God's Spirit. The Bible declares:

"I am the good shepherd, and know my sheep, and am *known* of mine" (John 10:14; *KJV*).

"For we *know* in part, and we prophesy in part" (1 Cor. 13:9; *KJV*)

"For ye *know* the grace of our Lord Jesus Christ" (2 Cor. 8:9; *KJV*; emphases mine)

And perhaps the most vivid passage of the endowment of the knowledge of God in believers can be found in Ephesians:

That the God of our Lord Jesus Christ, the Father of glory, may give unto you the spirit
of wisdom and revelation in the *knowledge* of him: The eyes of your understanding being

enlightened; that ye may *know* what is the hope of his calling, and what the riches of the glory of his inheritance in the saints (Eph. 1:17-18; *KJV*; emphasis mine)

In this passage, we see that the source of our knowledge of God comes not from reason but from God Himself. Now, the Holy Spirit also has the role of convicting non-believers of their spiritual darkness. Concerning this, Jesus makes the following remarks:

But I tell you the truth: It is for your good that I am going away. Unless I go away, the Counselor will not come to you; but if I go, I will send him to you. When he comes, he will convict the world of guilt in regard to sin and righteousness and judgment: in regard to sin, because men do not believe in me; in regard to righteousness, because I am going to the Father, where you can see me no longer; and in regard to judgment, because the prince of this world now. (John 16:7-11; *NIV*)

But, you may ask, if the Holy Spirit is the one who compels us and convicts us of our spiritual situations then why do we bother reasoning about our faith? The answer is that it is through reason and argumentation that we pedagogically allow the Holy Spirit to work in the lives of non-believers. And this just seems to be naturally so. If you wanted to sell a product that you found extraordinary and wanted others to benefit from it then you would no doubt *reason* with your potential buyer that the benefits of having this product far outweigh the option of not having it. You may even say to yourself that such a product sells itself and really doesn't need a salesperson to go door-to-door in search of potential buyers. This is echoed in Christians who declare, "I am just going to preach the gospel and leave it to God to win the souls." But even the owner of our analogous product knows that many people are not *aware* of such an item and that others simply need *reasons* to bridge the gap of their need with their buying it. Similarly, Christians must include in their evangelism the tool of *apologetics*. The word "apologetics" comes from the Greek word *apologia* which means "to give a defense." If a non-believer begins to criticize Christianity or calls a certain issue into question, then the Christian engages in apologetics. Apologetics, like various martial arts and self-defense techniques, are to only be used as a means for defense. After all, you wouldn't barge into someone's home with your product and begin defending it from critics. You would kindly and gently present your case for the potential buyer's appeal and begin defending the product only if it comes under attack. If the product is truly that good, it may be revealed through the presentation. But if someone decides not to purchase it, it is probably due to your weak presentation and not the product itself. I suspect the same is true of apologetics. Christians *know* that God exists, but they may just have a hard time conveying this message to the satisfaction of the recipient. The final reason why someone may not choose to buy our product is because they have closed their minds to the notion of ever receiving it *under any circumstances*. If our salespeople encounter such closed-mindedness, then we would only be wasting our time and energy attempting to convince them. But again, such failure is not necessarily the fault of the product but perhaps of the potential buyer. In the cases of refusal we have seen above, neither one is to necessarily be attributed to the product

itself. Let us now match our analogy to Christian apologetics. What does the Bible have to say about reasoning with non-believers? First, we are commanded to make a defense of our faith:

But in your hearts set apart Christ as Lord. Always be prepared to give an answer to everyone who asks you to give the reason for the hope that you have. But do this with gentleness and respect, keeping a clear conscience, so that those who speak maliciously against your good behavior in Christ may be ashamed of their slander.

(1 Peter 3:15-16; *NIV*)

Secondly, there is biblical precedent set before us of those who have reasoned with non-believers about the truth of Christianity.

Now the Bereans were of more noble character than the Thessalonians, for they received the message with great eagerness and examined the Scriptures every day to see if what Paul said was true. (Acts 17:11; *NIV*)

But examine everything {carefully} hold fast to that which is good; (1 Thess. 5:21; *NAS*)

Dearly loved friends, don't always believe everything you hear just because someone says it is a message from God: test it first to see if it really is. For there are many false teachers around, and the way to find out if their message is from the Holy Spirit is to ask: Does it really agree that Jesus Christ, God's Son, actually became man with a human body? If so, then the message is from God. (1 John 4:1-2; *TLB*)

To whom also he shewed himself alive after his passion by many infallible proofs, being seen of them forty days, and speaking of the things pertaining to the kingdom of God:

(Acts 1:3; *KJV*)

In one of his greatest sermons, Peter uses several arguments to appeal to his audience. He cites miracles (Acts 2:22, 43), the resurrection of Jesus (v. 32), and the human predicament (v. 40) in order to bring about three thousand to salvation (v. 41). Now, God can certainly take care of Himself, but He has clearly embedded the responsibility of bringing others to the knowledge of God through the apologetic tool. If we encounter a potential convert who would willingly submit his life to Christ if he were to only have his questions answered, then why *wouldn't* we address them? In the case of the first encounter of the product, the potential buyer only needed to intellectually grasp the significance of owning such a product. If our product is God Himself then we should not withhold Him. Jesus said, "Go ye therefore, and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost: Teaching them to observe all things whatsoever I have commanded you: and, lo, I am with you alway, even unto the end of the world. Amen" (Matt. 28:19-20; *KJV*).

3. THE STRUCTURES OF ARGUMENTS

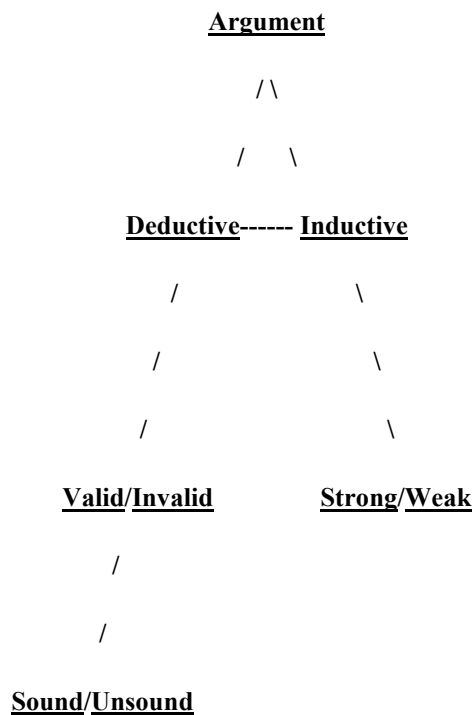
I remember in high school when an acquaintance of mine told me that if I believed in God then I was not using logic and reason in my everyday thinking (an insult to be sure). Of course, since I was just a teenager learning in various subjects along with everyone else basic principles, I was taken back by this remark. He told me that if I really believe in such fairy tales then I am not using any intellectual sense. He simply felt that logic and reason were diametrically opposed to a belief in God. With my buttons having been pressed, I managed to stump him with the question, "How can our universe exist at all unless someone greater than it created it?" He just went on to the subject of evolution and we eventually lost sight of the initial discussion. Nonetheless, many of us have come across similar circumstances where Christianity is put under the microscope of rational scrutiny. It is as if the skeptic is whetting his appetite ready to pitch his fork into your logically amateur mind. But are we to believe that logic and reason play no part in the defense of Christianity? In this section we will look at the general structures of logical arguments, the particular structure of the *kalam* cosmological argument, and the particular evidences in support of the argument itself.

Without delving deep into reasoning and critical thinking on a college-level basis here, we will only be concerned with the difference between the structure of the *kalam* argument versus the structure of other arguments. Basically, what we need to understand is the nature of an argument in general and the structure of good arguments in particular. A collection of statements is said to be an *argument* when two necessary elements are involved. These elements are the supporting statements, or *premises*, toward the support of a claim, or *conclusion*. For example, if I say that roses are red and violets are blue because our uniform experience verifies this, then I have just given an argument. This argument can be constructed as follows:

premise (or just p): Our uniform experience verifies that roses are red and violets are blue.

conclusion (or just C): Therefore, roses are red and violets are blue.

Although the contents of the argument are uncompromisingly important, we need to see how the *relationship* between the premise(s) and the conclusion operate. In order to strip ourselves from any bias we will use letters, or *variables*, to represent statements of alleged fact. After all, just looking at this illustration automatically tells us that such a relationship is warranted since our collective experience most certainly does suggest that roses are red and violets are blue. Before we look at any more examples of arguments using variables in place of statements, let us look at a rough sketch at our intended goal. Just like the captain of a ship needs to chart his course of destination, we will also chart our course of argument structures for our final destination.



This argument tree shows us that an argument breaks down into branches of subcategories. This is called *analyzing an argument*. You see that an argument can either be deductive or inductive. A *deductive* argument is an argument where if the premises are factually true then the conclusion is guaranteed (or certain). So it is logically impossible to have true premises and a false conclusion. An *inductive* argument is structured so that if the relationship of the premises to the conclusion is such that if the premises were true then the conclusion would only be probably true. So, it may be that the premises are true but this does not *guarantee* that the desired conclusion itself is true. The illustration about roses and violets I used above is a

demonstration of an inductive argument. Since we do not need to be concerned with inductive arguments in our structure of the *kalam* cosmological argument then we will simply examine the deductive branch of an argument. ⁽¹⁾

In the argument tree above you will notice that the deductive branch splits into *valid* and *invalid*. An argument is said to be invalid when the structure of the deductive argument yields true premises and a false conclusion. In this case it is all over for the argument. But if the deductive argument turns out to be valid then this tells us that there is never a time when the premises are true and the conclusion false. Consider the structure of a deductively valid argument:

p1: If X then Y.

p2: X.

C: Therefore, Y.

We may substitute the variables with an example:

p1: If I live in Nevada then I live in the United States.

p2: I live in Nevada.

C: Therefore, I live in the United States.

This argument is deductive because the structure claims to guarantee the conclusion. It also turns out to be valid because no matter what truth value I substitute for the variables X and Y in the previous argument (whether true or false statements), I will never have true premises and a false conclusion. In the second argument it is *impossible* for me to live in Nevada and not be in the United States. This setup guarantees our confidence in the structure.

Our final consideration of general deductive arguments is the question of *soundness*. An argument is said to be sound if the premises are genuinely connected to the conclusion. This is the most difficult part of determining if the argument is ultimately a good one or not. For example:

p1: If I eat breakfast this morning then the Dodgers will win the next World Series.

p2: I ate breakfast this morning.

C: Therefore, the Dodgers will win the next World Series.

There is no doubt that the argument is deductive. It also happens to be valid. But there is something peculiar about my eating breakfast this morning causing a Dodger victory in the next World Series. As much as I would like it to be true, the argument is doomed to be unsound.

So, how does all of this play into the *kalam* cosmological argument? We can answer this by using variables to illustrate its structure and, consequently, analyze it with our argument tree. The *kalam* cosmological argument takes the form of a *quasi-syllogism*. This argument structure rationalizes a truth about a particular member from its class from the same truth about the class itself.

This can be exemplified as:

p1: All men are mortal.

p2: Socrates is a man.

C: Therefore, Socrates is mortal.

The truth about a particular member (Socrates) is that he has a true property (mortality). This is inferred from premise 1 which tells us that every member of the class (all men) has the same truth (mortality). The *kalam* argument then fits the quasi-syllogistic structure and can be represented as:

p1: Every X has p.

p2: Y is a member of X.

C: Therefore, Y has p.

In premise 1 the word "every" is used instead of "all." This difference is inconsequential. To say that all men are mortal is to say that every man is mortal. Thus, the same message is being conveyed. Both words in this sense are said to be *universal* and can be expressed either way. Now, the structure above is certainly a deductive argument. The conclusion must follow with uncontested certainty from the premises if they are true. The argument is also valid since every possible combination of truth values substituted for the variables never yields true premises and a false conclusion. This only leaves the question of soundness. Since soundness considers the actual statements themselves then we will have to examine the statements

individually to see if they reasonably connect to the conclusion. This is where we apply our ultimate assessment of deductive arguments.

4. THE *KALAM* COSMOLOGICAL ARGUMENT

I have met a variety of people ranging from those who see evidence for God's existence and are wholly persuaded and those who review the evidence and outright reject it. For this reason I prefer to preface my presentation of the evidence for God's existence with a simple word of caution about how arguments figure into the decision-making process. I am not claiming to be able to present evidence for God's existence in such a way as to yield mathematical certainty. Remember that deductive arguments ultimately find their success or failure in their ability to be sound. Questions about knowledgeable certainty is an epistemological controversy and does not alter the success of a deductive argument. I see too many Christians with bold expectations about such evidence that they think that upon delivering such evidence an atheist or agnostic will become overwhelmed by the evidence's magnanimous force and will cause an "on-the-spot" conversion. I only wish this were true. But reality has taught many of us that only evidence can be provided and God's Spirit must perform the rest. How God uses that evidence is reserved solely to His providential will. And just one final piece of information. The argument you are about to read is not new. I do not pretend to be advancing a revolutionary piece of disclosed evidence for God. In today's desperate need to persuade people toward Christianity, we are now making an unprecedented leap from evidence to esoteric revelation. Christians are now proclaiming failure for the historical arguments for God's existence and Christianity's veridical stature and are opting for peculiar apologetics in such things as Equidistant Letter Sequencing and the supposed "Bible code." As far as I am concerned, if Christians can only make their case by resorting to unbelievable defenses then we have sorely neglected the rich arguments that great men and women of passed centuries have advanced. This is my attempt at a resurgence of what many today consider one of the most powerful evidences for the Christian faith: The *kalam* cosmological argument. And to this we shall now turn.

The *kalam* cosmological argument is the product of a history of refined evidence utilizing astronomy and astrophysics to empirically demonstrate that a cause for the universe is necessary if we are to make sense of its existence. In addition, some powerful philosophical arguments have been injected into these arguments as further support for what appeared to Medieval philosophers as obvious. "*Kalam*" is the general Arabic term for "argue" or "discuss," but no precise definition corresponds to English.⁽²⁾ It has been a term associated with the "dialectical theology" promoted by Islamic philosophers during the peak of Aristotelian Christianity and it represents the notion that, given the impossibility of an actual infinite, the universe could not have existed for all eternity since time itself is a set of discrete segments pointing indefinitely back into the past. In their scientific defense of the beginning of the universe, they saw the celestial sphere as empirical evidence for their philosophical conclusions. In Christian antiquity, great philosophers as Thomas Aquinas and Bonaventure have also advanced cosmological evidences for the existence of a cause for the universe. Each philosopher who has pushed for a cosmological argument in support of the existence of God has stylized his own argument as a supplement to other cosmological arguments. There is no doubt that history has shown us such great evidence. But the present has taught us that ideologies and arguments are fair game for critics. Given the current advances of scientific knowledge about our universe and its origin, we have seen such Medieval and contemporary cosmological arguments weather even the most vilifying criticisms. Perhaps that is what makes cosmological arguments so appealing. They have survived the test of time. In contrast, atheistic arguments have been refined, redefined, revamped, and even abandoned in order to desperately seek an academic opening that would allow the skeptic to safely slip through. But the final arbiter will be the reader as to whether or not there truly is good evidence to show God's existence.

The *kalam* argument is a simple construction. Remember that it claims to be a deductive argument and that it has the form of a quasi-syllogism. For simplicity's sake, here is a reconstruction of the *kalam* cosmological argument in its skeletal form:

p1: Everything that begins to exist has a cause for its existence.

p2: The universe began to exist.

C: Therefore, the universe has a cause.

The argument itself is pretty straightforward but it does not end there. Remember that deductive arguments also have to survive the tests of validity and soundness. The validity question can be answered right away. As it is in the case of Socrates' mortality, it seems that if the premises are true then the conclusion definitely follows. This seems to be the case since so many atheists have criticized this argument, not on the basis of false premises (though many do), but on the basis of the conclusion's insufficiency to point to God even if such an argument turns out to be undeniably sound. Skeptics usually say, "Even though there is a cause for the universe's existence that doesn't mean that the cause is 'God!'" It seems that the presence of this question serves to show that the argument itself is valid but missing other elements necessary to declare the cause to be God (of course we will deal with this cumulative argument later once we have substantiated the conclusion). But the soundness question of the argument is the final one to be answered and is not readily accepted by skeptics of theism. Yet non-theists have not been able to come up with any convincing responses to it. As you discover the individual support for each premise, my hope is that you see the argument's success and that it provides ample support for the justification of belief in God.

4.1 Everything That Begins To Exist Has A Cause For Its Existence.

The first premise in the *kalam* argument claims to conform with the general uniform intuition that things just do not "pop" into existence uncaused. Nothing in nature or in the theoretical sciences have been able to push for an incredible belief that something can or did mysteriously "pop" into existence without the aid of a cause. Such a premise has usually gone on without much debate. It just seems to be a veridical reality that everything that exists has a cause for its existence, and if it does not then we would naturally begin to probe such a fantastic claim.

Our pre-noetic structure, or our intellectual makeup prior to its sensing the physical world, seems to guide our interpretation of sense data in the experiential world. Many philosophers have posited the notion that our intellects begin as blank slates prompting raw empirical input. They, that is who follows the empiricists, identify this state of intellectual emptiness as the *tabula rasa* or the "blank tablet." Classically, ancient empiricists (like Aristotle) have argued against Plato's belief that our understanding and realizations about the world are based on a transcendent world encasing the Forms, or archetypal structures of identification, as the explanation for our awareness of certain objects and relationships. For Plato, causation may imply the Form of "Cause" being manifested through a particular event, say the causing of a computer to switch on, in order to bring comprehension of the event to the observer. Aristotle did not accept this world of the Forms because he believed that if Forms did exist, they would be *a priori* bound up in the particular manifestations themselves. So, how does Aristotle account for the existence of universals if they are only generalizations of particular occurrences? Philosopher and theologian Ed L. Miller writes:

Aristotle's answer is that the universal and necessary elements of knowledge - the foundations of all subsequent reasoning - are built up in the mind through *induction*.⁽³⁾

The process of induction is the inferring of general characteristics necessary to identify a particular object or occurrence (or *universals*) to the particular object or event itself (or a *particular*). So, Aristotle believed that the source of our understanding of universals came through the induction of collected experiences leading us to conclude those characteristics that are necessary for that item or event to be categorically identified. Simply put, a universal is the *whatness* or essence of an object (i.e. What makes X an X to begin with?) and a particular ostensibly points to *this* or *that* as a representation of a universal. Thus, "a chair" is a particular while "chairness" is its universal. Both Plato and Aristotle concurred with this. But they disagreed *how* knowledge of universals became evident to the human intellect. Plato believed that the universal (or Form) defined a particular. Aristotle believed that a series of experienced particulars led to our understanding of the universal. Who is right?

The preferred answer came not from Aristotle or Plato, but through the school of *Idealism*. Idealism is the view that our intellects are "constructed" with "built-in" categories of objects and events in relation to each other. The reality of these objects depends on whether one is a *subjective idealist* or an *objective idealist*. The former believes that reality relies on perception for its existence and the latter suggests that reality exists apart from the perception of it. Historically, men such as George Berkeley, Renee Descartes, Immanuel Kant, and John Locke have defined and defended differing views of idealism. For the purposes of this essay and in the interest of brevity, we shall presume a common sense approach to the situation. This will incline us to opt for a synthesis of both idealism and empiricism. Think how we could devise something like a one thousand sided figure or a mathematical infinity if only empiricism were true. We would, according to empiricism, be obliged to sense a variety of particular infinities and one thousand sided figures in order to universalize them. But this is clearly absurd. It is absolutely necessary that we have at least some sort of pre-noetic structure that possesses a way of defining particulars in their absence (we may even see that infinity is not even a real property in the world in which to sense; this implies some sort of idealism).⁽⁴⁾ Therefore, we have pre-experiential intellectual structures which assist in our defining the real world.

When we think about the sentence "everything that begins to exist has a cause for its existence" it seems intuitively clear that such a systematic expression surpasses all experiences. We can be confident in the obviousness of this expression as it signifies cause-effect relationships in the real world. Neo-Kantian Stuart Hackett makes the following comment:

Either the categories are thus *a priori* or they are derived from experiences. But an experiential derivation of the categories is impossible because only by their means can an object be thought in the first place. Since the categories are pre-conditions of all possible knowledge, they cannot have been derived from an experience of particular objects: the very first experience would be unintelligible without a structure of the mind to analyze it.⁽⁵⁾

In other words, it makes no sense to suppose that we can derive the first notion that everything which begins to exist has a cause via experience unless something non-experientially distinguished this notion to begin with. But even if one denies the *a priori* category of the causal principle, it still strongly appeals to the intuitions of even the most ardent skeptic. Natural philosopher and empiricist David Hume once remarked:

But allow me to tell you that I never asserted so absurd a Proposition as *that anything might arise without a cause*: I only maintain'd, that our Certainty of the Falshood of that Proposition proceeded neither from Intuition nor Demonstration; but from another Source.⁽⁶⁾

This implies that even one who questions the validity of cause-effect relationships has to admit its veracity in order to remain rational in accepting it. I suppose that even empiricists unite on the most basic of beliefs when it comes to obvious truths such as this one. This makes our first premise of the *kalam* cosmological argument probably a true one.

One final consideration needs to be observed. Modern day cosmological speculations about the utilization of quantum theory in the universe's origin attempt to dismiss the notion that all things that begin to exist require a cause. In quantum physics, some scientists suppose that a high-level theoretical entity called a *virtual particle* may be exempt from the causation principle arguing that such theoretical entities are non-Newtonian in nature. This fancy scientific footwork used to elevate an exception to our premise that everything that begins to exist has a cause is only an imaginary distraction much like David Copperfield's dancing ladies. But there really is a man behind the curtain who fancifully smokescreens the premise's implication. There are generally two main problems with the virtual particle argument. First, theoretical scientists have to make the universe a virtual particle in order to make it an exception to the causal principle.⁽⁷⁾ But if we are to take this seriously, I find no correlation between a virtual particle and the universe. There is no similarity in definition or detail. Besides, why do we not see additional universes "popping" into existence uncaused if virtual particles are the culprits? The fact that the universe is not a virtual particle is profound. So, what if the universe were only *analogous* to a virtual particle?⁽⁸⁾ This would also fail since the universe is clearly not analogous to a virtual particle. The universe is visible and does not need to be necessarily described in terms of quantum mechanics for the purpose of scientific comprehension. An obvious Newtonian or Einsteinian model obviates such a need. Secondly, quantum physics is a theoretical science that remains in its underdeveloped infancy. The fact that quantum events are just comprehensible manifestations of unobservable entities demands that such a system be interpreted with caution. This is why most people opt for the Copenhagen interpretation of quantum events associated with Niels Bohr.⁽⁹⁾ Quantum particles serve to conclude scientific problems but have no real bearing on reality. Such a view sees quantum physics as a science similar to astronomical theories about WIMPs and Dark Matter.

Therefore, without having to spend too much time and energy dealing with what could only be criticized in a philosophical vacuum and not in the real world, the premise that everything which begins to exist has a cause for its existence seems to be a well-established principle underscored by experience.

4.2 The Universe Began To Exist.

This premise is perhaps the vital organ of the *kalam* cosmological argument and, if removed or refuted, would certainly put this argument into academic arrest. There would be no need to worry about a clearly intuitive notion that everything which begins to exist has a cause for its existence since the other leg of the argument would be undermined. This simple statement, yet one which has been the target of both philosophers and scientists, is the key to a sound deductive argument whose implication is to believe in an ultimate cause of the universe. Defenders of the *kalam* argument have split the support for the belief that the universe began to exist into two categories: (i) Philosophy shows that there cannot be an infinite regression of time since that would imply the absurd notion that an actually infinite number of things exists in the real world. (ii) Science shows us through the best astronomical model of the origin of the universe and through the Second Law of Thermodynamics that the universe began to exist. If at least one of these independent categories turns out to be true, then we have no rational choice but to concede the truth that the universe began to exist. So we will now take a closer look at each of these two categories and why no rationally thinking person should reject them.

4.2.1 *Philosophical Arguments*

In order to make the case that our universe must have a beginning, we will concentrate in this section on the more abstract reasons to reject the real possibility of an actually infinite past. This particular argument suggests that if no real actual infinities exist and no actual infinities can be achieved through successive addition, then the only option for quantitative values is to be limited to a finite value (which may progress indefinitely). Since the total number of past events in the history of the universe is a quantitative value, then the total number of past events in the history of the universe must be finite. Our conclusion will yield the only other option to an actually infinite number of past events which is that our universe began to exist some time ago.

4.2.1.1 *It is impossible to have an actually infinite number of things.*

Even more peculiar to this system of mental gymnastics is the ancient approach to the problem of motion in the early Eleatic school of Parmenides. Zeno of Elea, born around 489 B.C., came to the defense of the non-existence of motion against Pythagorean pluralism. The dilemma of pluralism left to the Pythagoreans suggested that either everything that exists is infinitely large or infinitely small. If this is true then since individual components (or "units") of the universe possess no magnitude we could not possibly expect that a totality of these components could add up to produce magnitude collectively. That is, anything multiplied by zero is still zero:

$$u(0) \times n = 0$$

This led Zeno to conclude that a plurality of "units" in the composition of reality is an absurd notion. Concerning motion, the problem of infinity again buttressed the Parmenidean concept of a single Reality. Where the existence of such would preclude a singular Reality, one could not honestly believe that it exists. This is where Zeno's famous paradox of Achilles and the tortoise comes into play. Zeno, contrary to the Pythagoreans, asked us to imagine a race where Achilles and a tortoise are going to compete. Achilles, being the sportsman that he is, grants the tortoise a head start. But when Achilles begins his run after the tortoise has reached a certain distance then the supposition that a straight line on the racetrack has an infinite number of points promotes a paradox. Zeno shows that Achilles, in order to catch up to his opponent, must first arrive at the point where the tortoise was. In so doing, the tortoise naturally has advanced to another point on this racing line. Even if the tortoise only moves a relatively short distance, Achilles still has the task of reaching *that* point before proceeding any further. But, again, the tortoise has already moved on to another point on the line. On the surface, Achilles seems to be closing in on the tortoise, but since he must first traverse the same points already covered by the tortoise then he will *never* overtake his opponent.

In order for Achilles to catch up to the tortoise he must approach those points already traveled by the tortoise. But when Achilles makes his move the tortoise is also moving toward additional points on the race line. And Achilles must reach *those* points before he can at least catch up to his opponent. But since the tortoise is obviously not going to stop but keep running, then Achilles still has the task of reaching those same points that the tortoise has already covered. So,

If (t) is at 2 then (A) must traverse 1 to catch up.

If (t) is at 3 then (A) must traverse 2 to catch up.

If (t) is at 4 then (A) must traverse 3 to catch up.

If (t) is at 5 then (A) must traverse 5 to catch up . . .

No matter how fast the turtle travels it seems assured that Achilles will never catch up. The tortoise still retains victory since he knows that Achilles must reach those same points before he can catch up. The tortoise need only advance one more point, no matter how short a distance, in order to insure that Achilles could never catch up. The fact that a line contains an infinite number of points entails that the tortoise can go as slow as he wants and never lose a race with even the quickest opponent, so long as the tortoise can begin the race with at least a one point handicap over his opponent.⁽¹⁰⁾

With this illustration in mind, consider the mathematical formula expressing the impossibility of reaching the destination on an infinite line:

$$4 - 1 = 4$$

Because there are an infinite number of bisections that can obtain by dividing some whole number an infinite number of times then there are an actually infinite number of midpoints between two whole numbers. It seems that we could multiply any whole number with an infinite number of divided fractions and never achieve a result equaling the next whole number. This seems to show that an infinite number of midpoints can never be achieved.

Is it true, then, that Achilles can never catch up with the tortoise as long as the tortoise keeps moving? Of course he can. The problem with Zeno's paradox is that there is no such thing as an actually infinite number of midpoints. Instead, we see the number of times a whole number can be divided as *indefinite* (or *potentially infinite*). Given the finitude of the real points on the racetrack where Achilles and the tortoise are racing, Achilles need only cover more finite points per every set of points covered by the tortoise. This is what we call *rate*.

$$d = rt$$

Given a certain finite distance (d) to be traversed in some length of time (t), then we can calculate how long it would take for the tortoise to cover (d):

$$r = d/t$$

So, in order for Achilles to win the gold medal, he must have a rate (r_2) exceeding the tortoise's:

$$r_2 > r$$

Given this, it is impossible to see how the tortoise could win the race as long as the rate is within the bounds of the time allotted.

Therefore, if an actually infinite number of things really exists then such a number results in self-contradictory answers. Zeno's paradox shows that there cannot really be an actual infinite since this would imply that a lagging racer could never reach his winning opponent no matter how long he has and how slow the winner moves. These considerations rationally force us to suppose that an actual infinite is just an idea in the mind and not something that exists as a property in reality. Since time itself is a set of discrete members partitioned by seconds, days, years, and so on, then time must be a finite set of members. This means that the universe must have begun to exist.

4.2.1.2 *It is impossible to obtain an actually infinite number of things through successive addition.*

Mathematicians have puzzled for centuries on the precise meaning of *infinity* as it relates to the real world. Some have eliminated the puzzle by suggesting that infinity is merely something that exists in the mind. Others maintain that infinity possesses some ontological status in the real world. In an attempt to demonstrate the difference between the *reality* of an infinite and the *idea* of an infinite, Aristotle had suggested the terms *actual infinite* (the completed whole value of infinity) and *potential infinite* (an indefinite count susceptible to infinite addition).⁽¹¹⁾

For the sake of our discussion here, it will be necessary to elucidate the concepts of *set* and *subset*. The famous mathematician Georg Cantor developed a system of categorizing groups of numbers as members of a collective. This systematic arrangement is identified as *set theory*. A mathematical set is a collection of mathematical members. We can label, manipulate, and compare members of a set to another value, set, or whatever a mathematician can come up with. For example, suppose that we wanted to talk about a small group of friends whose names are Joe, Frank, and Wendy. We can call this group *set A*:

$$A = \{\text{Joe, Frank, Wendy}\}$$

Within set A (the set that includes a closed circle of friends) are three friends. This total number of friends is called the *cardinal number*. In this example the cardinal number of friends we have is three. But what if we wanted to talk about only two of the three friends? How would we categorize them mathematically? When we begin pointing to members within a set, we call this reference a *subset* or *proper subset* depending on how we do this. But a subset to our example may include just Joe and Wendy. So, if A_1 represented the two friends we wished to discuss then:

$$A_1 = \{\text{Joe, Wendy}\}$$

As you can see, set A has three members while subset A_1 only has two members. With this example in mind we can now graduate to a more abstract usage of set theory. Consider the following:

$$A = \{1, 2, 3, 4, 5\}$$

We can clearly see that any subset extracted from set A would have a cardinal number no greater than five ($A_1 \leq 5$). We could make A_1 stand for $\{1, 3, 5\}$ or $\{2, 4\}$. As long as our imagination is free to wander, we can come up with any number of combinations. If we begin comparing two sets then we can begin to see how mathematics begins to work its arithmetical magic. Suppose subsets A_1 and A_2 are compared with set A:

$$A = \{1, 2, 3, 4, 5\}$$

$$A_1 = \{1, 3, 5\}$$

$$A_2 = \{2, 4\}$$

We see that according to the principle that the "whole is greater than its parts" we can never have a situation where a subset of A can be larger than the original set A (remember the rule about cardinal numbers?). So, no matter how we formulate a subset, it must always conform to this principle. But when we repose the simple realm of finite numbers into the realm of transfinite numbers, our world principle begins to break down. Sure, one could easily look at this and say that this principle works with finite numbers but not with transfinite numbers and avoid the complications altogether. But I see this response unwarranted and arbitrary. It supposes that transfinite mathematics can be categorized apart from finite mathematics. This means that if I count to the highest finite number then the rule that the "whole is greater than its parts" applies. This implies that if I count one more number then the rule breaks down. So:

0, 1, 2 . . . finite n

0, 1, 2, . . . finite n + 1

But why should one more number make any difference to the rest of the set? The truth is, it only works in the mental world of mathematics. But more fundamentally, this is *why* the finite/transfinite distinction exists in the first place.

Regarding the achievement of infinity by successive addition, Analytic philosopher Bertrand Russell (1872-1970) believed that an actual infinite could be accomplished as long as the counter possessed an actually infinite number of years to complete the task. In the example given in Sterne's novel, we have the example of Tristram Shandy.⁽¹²⁾ Sterne writes about Tristram Shandy as an extraordinarily slow individual committed to writing an autobiography. However, he is so slow that it takes him one year of writing in order to complete only one day of his personal history. This means that the most recent event that could be recorded is the day that occurred only one year ago. As Shandy writes an additional day, it takes him an additional year to complete the events of that day. Russell uses this example and believes that an actual infinite can be achieved through successive addition only if Shandy has an infinite number of days to complete it.

Bertrand Russell suspected that a true life Tristram Shandy paradox could be solved. For Russell, it is the individual who possesses an infinite number of days. Of course mortal individuals possess merely a finite number of days. According to Russell, this is the key to solving the apparent problem. The paradox posits an autobiographer who writes on every day passed. Since it takes Shandy one year (=365 days) to complete one day, then in terms of a one-to-one correspondence with temporal history it would appear to be futile on a finite level:

Observed History: 1 day, 2 days, 3 days, 4 days, 5 days, . . .

Recorded History: 365 days, 730 days, 1095 days, 1460 days, 1825 days, . . .

On the surface it would seem mathematically impossible for Shandy to complete writing on all the days passed. Since each day yields an additional 365 days to write then it would seem that the longer Shandy wrote the further behind he would get. Russell solves this mathematical problem by suggesting an actually infinite number of years as the required antecedent for finishing the task (and to be sure it is certainly a *necessary* antecedent). For the sake of written mathematical concepts, the symbol often used to refer to a mathematical infinite is the Aleph Null (\aleph_0). As one observes the following equation, it appears to suggest something not true of usual, finite numbers.

$$\aleph_0 + 1 = \aleph_0$$

The implication here is that since any number added to infinity is still infinity, then the principle that *the whole is greater than the parts* does not apply here. One component of the equation (\aleph_0) is quantitatively equal to the sum of both components (\aleph_0 and 1). This is a good mathematical illustration with the problem of the reality of an actual infinite we already looked at. But concerning the adding of individual discrete parts to total an infinite set, Russell asserts that given an infinite number of years to write plus the infinite number of days written about results in an infinite amount of time actually transpired. Thus, the amount of time to write (if obtained) would be equal to the amount of time given to write about. Therefore (Let d = days to write on; y = years to complete; t = time obtained):

$$y(\aleph_0) + d(\aleph_0) = \aleph_0(t)$$

Russell believed that when the presence of infinity is seen all at once, then the concept of infinity is something that can exist as a quantitative property in the real world (he does not mean *exist* in the Platonic sense).⁽¹³⁾

At this time I will briefly present two opposing views on Russell's assessment of the Tristram Shandy paradox and the problem with an actual infinite through successive addition.

Atheist philosopher Quentin Smith presents the Tristram Shandy paradox in his essay on the existence of infinity in the past. His purpose is to show that it is feasible to exist in a universe that does not have a beginning (this is in contrast to the theistic belief that the universe began to exist). Smith, with regard to Russell, makes this observation:

the number of past days written about is a proper subset of the infinite set of past days, and a proper subset of an infinite set can be numerically equivalent to the set even though there are members of the set that are not members of the proper subset. Just as the infinite set of natural numbers has the same number of members as its proper subset of equal numbers, yet has members that are not members of this proper subset (these members being the odd numbers); so the infinite set of past days has the same number of members as its proper subset of days written about, yet has members that are not members of this proper subset (these members being the days unwritten about).⁽¹⁴⁾

Smith maintains that the Tristram Shandy paradox is internally consistent in the light of sets and proper subsets.⁽¹⁵⁾ If it is true that

$$A = 1, 2, 3, 4, 5, \dots !0$$

$$A1 = 2, 4, 6, 8, \dots !0$$

$$A2 = 1, 3, 5, 7, \dots !0$$

then:

- 1) The total numbers of proper subset A1 = The total numbers of set A. ⁽¹⁶⁾
- 2) But, proper subset A1 does not contain the numbers of proper subset A2.
- 3) Therefore, proper subset A1 contains the same numbers as set A while *at the same time* not possessing numbers found in proper subset A2.

Smith shows that set theory validates the Tristram Shandy story and shows that the completion of his autobiography is ultimately possible.

Theistic philosopher William Lane Craig, in response to Smith, asserts that both Russell and Smith have missed the real issue involved in the paradox. Craig responds to Russell that

the problem with this argument seems to be that while an infinite number of years is a *necessary* condition of recording an infinite number of days at the rate of one day per year, it is not a *sufficient* condition. What is also needed is that the days and years be arranged in a certain way such that every day is succeeded by a year in which to record it. But then it will be seen that Tristram Shandy's task is inherently paradoxical; the absurdity lies not in the infinity of the past but in the task itself. ⁽¹⁷⁾

Craig claims that instead of Shandy writing forever and catching up on history, he would eventually be infinitely far behind.⁽¹⁸⁾ Craig further points out that the picture Russell paints entails a beginningless task. That is, if one were to ask "Where in the temporal series of events are the days recorded by Tristram Shandy at any given point?"⁽¹⁹⁾ then, according to Craig, one could only answer that the days are infinitely distant from the present. It appears that for every day Shandy is writing, there is an infinite distance from that day to the last recorded day. Craig shares with his critics that Russell's assessment fails to consider the real problem of consecutively counting to infinity.

On the question of an actual infinite, my sympathies are with Craig. I think both Russell and Smith have failed to convince me otherwise. At this point I will limit my response to Bertrand Russell's view of the Tristram Shandy paradox. My observation of the matter seems to yield two problems with Russell's justification.

First, if we observe what is really going on in the paradox then it becomes apparent that it is *logically* unsolvable and not merely *epistemologically* unsolvable. When we see that for each day there are 365 subsequent days of writing, then I fail to see how Shandy "catches up" on the autobiography. Mere comparisons of infinite sets and subsets bespeak the paradox's lesson. It is precisely because an infinite proper subset equals an infinite set why successive addition fails to obtain. It appears, then, that we are discussing two different worlds: the finite and the infinite.⁽²⁰⁾ So, if we uphold the principle of correspondence then it would appear that Tristram Shandy falls behind with each additional day he must write on. This makes the task unending.

Second, if we grant Russell's solution by granting immortality to Shandy, then it would appear that the problem is merely *extended* instead of *solved*. In other words, there is no reason to adhere to an actual infinite via successive addition by simply pushing back the *length* of the task to the *time* of the task. The question now becomes, "Will temporal segments of duration through successive addition arrive at an actual infinite?"⁽²¹⁾ Would we not still be dealing with successive addition to the infinite? At this point it would be absurd to respond by suggesting that such an achievement is based on *finite time* because the argument now concerns time itself. Therefore, it would be question-begging to merely extend the problem.

We have seen Bertrand Russell's attempt to prove the real possibility of achieving an actual infinite through successive addition. Even though the Tristram Shandy paradox of the slow autobiographer was designed to show why such a successive addition is not possible, Russell believed that the solution required Shandy to have an infinite number of days to complete his task. Quentin Smith agreed with Russell's contention and suggested the notion of sets and proper subsets to prove the point. William Lane Craig suggested that Russell had focused on the wrong issue and that the problem rested not in the necessary time to complete it but, rather, on the sufficiency of consecutive counting. I concluded with two reasons why Russell had failed to solve the puzzle. I had suggested that Russell's solution actually increased the problem and then extended it to successive segments of time. These reasons constitute why an actual infinite cannot truly be achieved by successive addition.

4.2.2 *Scientific Arguments*

Naturally when people view philosophical arguments, they tend to see them as abstract defenses of obscure propositions. The fact is, too many people find philosophical arguments both hard to follow and uninteresting. For those who find philosophical arguments worthwhile and appealing, such a defense for the non-existence of an actually infinite number of years as the total number of years in the history of the universe adds support to the *kalam* cosmological argument. One really need not proceed any further. In any

case, we can survey two scientific arguments in support of what we have already concluded by philosophy alone. In so doing, we will briefly examine two scientific claims about our universe and compare them to the *kalam's* claim in the second premise.

4.2.2.1 Astronomy and astrophysics declare that the universe began to exist via the Big Bang.

Common to evangelical Christians who so forcefully want to see the claims of evolutionary theory silenced suspect that the Big Bang theory of the origin of the universe is purely a Darwinian construction and ought not have anything whatsoever to do with "real" science.⁽²²⁾ But such popular apologetics need not take this route in order to suppose that our universe has a Creator. What we will see here is that the Big Bang actually *supports* the existence of God. This has been concluded by a number of non-Christian scientists who see the implication of a universe that began to exist.⁽²³⁾ At any rate, what we can provide for the Christian who objects to the Big Bang solely on its supposed ties to Darwinian evolution is assume that the Big Bang was truly a historical event. This way if such an event turns out to be proven to such a person's satisfaction then there will be no theological undermining of a Creator-God for the universe. But I think we can present a simple defense of the Big Bang theory for the origin of our spacetime universe to the satisfaction of the general population (particularly for the atheist who would generally accept the Big Bang theory as a proper description of the origin of our universe). All other theological judgments about the Big Bang will have to be suspended for our purposes here so that in the grander scheme God will turn out to exist after all.

In 1929, Edwin Hubble made a remarkable discovery. During his examination of the light spectrum from various galaxies, he began to see an interesting pattern indicative of every galaxy he would observe: galaxies have *redshift*. This means that the light observed in the light spectrum of those galaxies is shifted toward the red end of the spectrum. When we match this observation with the so-called *Doppler Effect* (the rule that wavelengths, when they are "approaching" an observer, are shorter while wavelengths, when they are "receding" from an observer, are longer), we can ascertain the radial velocity of the galaxy since redshift implies a receding of the galaxies observed. This can be illustrated by alluding to dropping a coin into a pond. If someone drops a coin into a pond then one sees the point of entry where the coin disturbs the pond and the waves produced by its wake. These waves travel outward away from the disturbance. Similarly, light and sound are composed of wavelengths and emit analogous waves through space. If an ambulance is blaring its sirens coming to rescue your sick neighbor, then you would hear the pitch of those sirens upon their approach increase. Once the ambulance picked up its ailed cargo then it would speed off to the nearest hospital where the sirens would then sound like they were running out of batteries. This is due to the increase of distance between the disturbance (the sirens themselves) and the observer. So, the greater the rate of departure, the greater (or larger) the wavelengths to the observer. Thus the radial velocity implies that the galaxies (the source of the "disturbance") are receding away from our earth (where our observers reside).⁽²⁴⁾ But this seems odd since if all galaxies are receding away from us in all directions equally then, if we were to go back into time we would eventually come to a point where all physical mass would be concentrated at a single point. This point is called the *singularity*. The current subject of cosmological debate centers around the very nature of the singularity and what happened "before" it. Or is such a question simply a meaningless enterprise? One could say that just like nothing is north of the North Pole then it is meaningless to suppose that something can be before the beginning. Such controversy has given the empirical atheist breathing room for its destructive blow dealt by the Big Bang theory. We will delve into speculation about the singularity and what happened "before" it when we assess the evidence collectively for premise two in the *kalam* argument. For now, let us see precisely how one derives the conclusion, as is noted in a variety of astronomical sources, that the universe began to exist approximately 15 to 20 billion years ago.

Just as there is a correlation between radial velocity and the light spectrum, we find a similar correlation between the expansion rate and the age of the universe. For the hopeful atheist, she might hope to observe an infinite number of years for the age of the universe. But if we can calculate a finite number for the age of

the universe (the Age-Day/Young-Earth debate aside) then we can conclude that the universe began some finite number of years ago. In order to do this, we have to find the correlation between the distances of the galaxy clusters and their radial velocities. This correlation is called the *Hubble constant* (H_0); and if we were to graph the relationship between radial velocity and distance then we would end up with a straight line. This straight line (or *slope*) represents the Hubble constant. What makes the error of margin so large in determining the expansion rate is that the distances of the galaxies are difficult to determine. We may compare the absolute magnitudes (M_{gal}) of the galaxies with their "apparent magnitudes" (m) in order to derive our rough estimates of the galaxial distances. When we chart our observations of the K and H lines of the ionized Calcium (Ca II) in the galaxial wavelengths and take their average, then we can calculate the expansion rate from these findings. The resulting wavelengths found in Ca II are measured in Angstroms (D). Nearby galaxies allow us to utilize the formula:

$$V = c \times \frac{\lambda - \lambda_{lab}}{\lambda}$$

where V is the velocity of the galaxy in km/s and c is the speed of light (300,000 km/s). For the K and H lines, λ_{lab} is **3933 D** and **3968 D**, respectively. If we observe, say, Bootes then we might come up with an average of 4449 D for the K line and 4488 D for the H line. By plugging these values into our formula we then have:

$$V(\text{H line}) = 300,000 \times \frac{4449 - 3933}{3933}$$

which results in V being **39000**. By repeating this formula for the K line we come up with:

$$V(\text{K line}) = 300,000 \times \frac{4488 - 3968}{3968}$$

which results in V being **39000**. Both of these values average, of course, to **39000**. Given the values of both m and M_{gal} then we can now compute the distance (D) of the galaxy Bootes in MegaParsecs (MPc). By using the formula:

$$D = \frac{10^{(m-M_{\text{gal}})/5}}{100,000}$$

with 7.74 as $(m-M_{\text{gal}})/5$ then we can derive an answer for D as 549.54 MegaParsecs. If we continue this process for at least two more galaxies then we can ascertain the necessary information to finally calculate H_0 :

$$H_0 = \frac{V}{D}$$

My personal observations have yielded $H_0 = 76.1$. Now we are ready to finally calculate the age of the universe (t_0):

$$t_0 = \frac{1000 \times 10^9}{H_0}$$

By calculating this formula we derive our result in billions of years. By using 76.1 for H_0 we come up with 13, 140, 604, 468 years or 13.14 billions of years. I admit that my estimates are a little off since they fall

behind the usually small estimate of 15 billions of years and assume an age value apart from any gravitational factors impinging upon the acceleration of the expansion, but this exercise only serves to show how these general calculations are accomplished. This is why the debate about t_0 causes us to alert ourselves to the objections recently leveled against these estimates pending the discoveries yielding a universe dating 8 to 12 billion years old.⁽²⁵⁾ But astrophysicists believe that this discovery only serves to refine our understanding as to how galaxies are formed. However, they are confident that their knowledge of nuclear reactions that power starlight and the chemical components of stars themselves retain those values opting for a 15 to 20 billion-year-old universe. Nonetheless, the evidence points toward a universe whose age is marked in finite terms.

Therefore, the universe began to exist and perhaps originated about 15 to 20 billion years ago. This is empirical evidence against the notion of a universe that never began. It is on this established basis do some atheists contend that the obscure nature of the singularity may introduce theoretical support for a universe that both began and is uncaused. We will examine this controversy later. In this section we were only interested in showing that the universe did indeed begin to exist contrary to supporters of cosmologies sustaining an infinitely old universe.⁽²⁶⁾

4.2.2.2 *The Second Law of Thermodynamics points to our universe as having begun to exist.*

Natural science has also been the friend of theism in many respects. Most interestingly, nature has been governed by laws that consistently operate and maintain the *modus operandi* of the interrelations between the natural world and causal principles. Natural laws serve to represent, under ideal conditions, how events are going to turn out given the sum of the particular event in question and the over-arching governing law. One of the best attested natural laws that so widely pervades the realm of science is the Second Law of Thermodynamics. Without this law we could not expect to take a warm bath or properly scent a house with air freshener. But what do we mean when we refer to the *Second* Law as opposed to the equally important First and Third Laws?⁽²⁷⁾ The truth is that each Law works together. The First Law was designed to deal with the method of the transference of energy which is conserved in its transmission. This is to say that kinetic energy, while never just appearing out of nowhere, must exist in some state under any circumstance. So, if we see wood burning then according to the First Law we must understand that the fire really isn't being eliminated on a flame-by-flame basis; instead, the energy bound up in the fire is gradually being dispersed into the atmosphere. The Third Law provides an objective frame of reference for values made to represent entropies. *Entropy* brings us to the Second Law. The Second Law entails two components of energy transfer: Temperature and Entropy. While temperature is a more familiar concept, entropy is more enigmatic since it is a term that is tossed about in various circumstances under different pretenses. Quite simply, entropy is a measure of the unavailability of some energy to do work. So the less energy that exists to do work, the more entropy there is in the closed system. In addition, the correlation between entropy and disorder is such that where entropy is increased, disorder is proportionally increased.⁽²⁸⁾ What does all of this mean? It means that if I turn on the hot and cold knobs for my bath then the water will not suddenly separate into a cold section and a hot section (like the presence of oil in a container with water). It also means that when we freshen up our house with an air freshener for soon-to-arrive guests then the pleasant odor will not retreat to the corner of the living room leaving the household air virtually unaffected. This dispersion of energy is properly understood in thermodynamical terms. In regard to high-temperature energy systems (should the system be isolated), the heat would eventually spread out over time throughout the system it inhabits. Once the dispersion is complete (or *equilibrium* is reached) then the energy begins to minimize until the energy "runs out." For example, suppose we enter a room where a cup of coffee is sitting on the table. Knowing that coffee is originally brewed hot, we sip it to see if it has been sitting out for any period of time. Upon taking a sip should it taste cold, then we know that the coffee had been placed there some time ago. If the coffee tasted very hot, then we may surmise that the coffee had just been poured. But the fact that the coffee is either hot or cold tells us that, given the nature of coffee when it is made, it had an origin.

The question about whether or not to apply the Second Law of Thermodynamics to the universe has been answered differently by a variety of astrophysicists. They maintain that the Second Law can only be applied to the universe if it is a closed system (i.e. a system where new energy is not being added by any outside source; this is not to be confused with the notion of a closed universe). So, in order to retain thermodynamic relationships within the universe it must first be understood that the universe is indeed a closed system, but more likely an open universe. Concerning the universe's fate, Dr. Beatrice Tinsley vividly describes its inevitable outcome:

If the universe has a low density, its death will be cold. It will expand forever at a slower and slower rate. Galaxies will turn all of their gas into stars, and the stars will burn out. Our own sun will become a cold, dead remnant, floating among the corpses of other stars in an increasingly isolated Milky Way.⁽²⁹⁾

Theoretical physicist Paul Davies made this striking observation:

If the universe has a finite stock of order, and is changing irreversibly towards disorder - ultimately to thermodynamic equilibrium - two very deep inferences follow immediately. The first is that the universe will eventually die, wallowing, as it were, in its own entropy. This is known among physicists as the 'heat death' of the universe. The second is that the universe cannot have existed forever, otherwise it would have reached its equilibrium end state an infinite time ago. Conclusion: the universe did not always exist.⁽³⁰⁾

These observations about the Second Law of Thermodynamics when applied to our universe show how the universe must have begun at some point in history. It would be false to suppose that the universe existed infinitely and yet had not used up its energy. In addition, the fact that the universe is still moving *toward* a state of energy loss entails that the universe began to exist some finite time ago. As Davies explained, an infinitely old universe would already have reached a state of equilibrium.

These observations about our universe ought to give us pause. We must realize that what science is actually suggesting is that the universe did not always exist but began a finite time ago. When I first surveyed this evidence I was immediately taken back with the startling implication that our universe really did come into existence at some point vindicating the first part of Genesis 1:1 which so beautifully and delicately describes "In the beginning . . .". This has been and continues to be confirmatory evidence of what theologians have declared for years. As Robert Jastrow once eloquently remarked:

He has scaled the mountains of ignorance; he is about to conquer the highest peak;

as he pulls himself over the final rock, he is greeted by a band of theologians who

have been sitting there for centuries.⁽³¹⁾

4.3 Therefore, The Universe Has A Cause.

Now we are able to tie in all of the things we have learned so far. First, we realized how reason plays a crucial role in the Holy Spirit's work at convincing others of the truth of God's existence. Secondly, we examined the proper structure of logical arguments as they are typically arranged. Thirdly, we established the deductive structure of the *kalam* cosmological argument for God's existence and analyzed each of its premises. The final issue for us to wrestle with is the warrant for God as the most plausible cause of the universe and the *kalam* argument's relative soundness.

If it is true that the universe began to exist and that everything that begins to exist has a cause for its existence, then it follows inescapably that the universe has a cause. But how does this import into the question of God's existence? The answer is found in the nature of the cause itself. Consider that if the cause precedes the beginning of or resides apart from the physical universe then it seems rather obvious that the cause must be non-physical or incorporeal. Plato, in the development of his theory of the incorporeal Ideas and Forms, once noted that the presence or status of materiality implies spatial existence. But, as Frederick Copleston notes, there is "no question of the Ideas being in a place, and, strictly speaking, they would be as much 'in' as 'out of' sensible things, for *ex hypothesi* they are incorporeal essences and incorporeal essences cannot be in a place."⁽³²⁾ Since the incorporeality and non-spatiality of God apply then we may surmise further that this cause is not mutable either. Mutability requires extension in space and time in order for real and measurable change to occur (it should be quite obvious here that such change does not equivocate to mean the changing of one's mind as was evident with the angelic realm).⁽³³⁾ Plato found agreement with Parmenides' concept of the incorporeal "One" because it too transcended physical space and time. Like Parmenides, Plato understood that matter implies change.⁽³⁴⁾ But if this cause resides outside of physical space and differentiated time and is an incorporeal and unchangeable entity, then how do we conclude personality? We know that events do not spontaneously "pop" into existence for no reason at all. Nor is it true that the cause must be event causation. If a cause begins to obtain then it is because of a prior cause. But since we cannot regress back toward infinity then there must be something that decisively begins the causation process. Consider a pot of water sitting on a stove. In time the stove will eventually heat the water to a boil. Unless someone alters the temperature of the stove by either removing it or shutting it off then the water will boil indefinitely until it completely evaporates into the air. Simply put, a constant material cause will yield a constant effect. If the cause were eternal then the effect would be eternal as well since it would forever apply the same conditions that existed at every other point of the effect's existence. This can only mean that if the effect is *temporal* then the cause itself must be personal. A personal (or

agential) cause freely brings into existence its intended effect at any time the cause so chooses. Of course if the personal cause were to cause something as grand as our universe then it must be both extremely intelligent (if not omniscient) and extremely powerful (if not omnipotent).

Therefore, the cause of the universe, having been established by both philosophical and scientific considerations, must be an uncaused, changeless, timeless, incorporeal, personal being with vast amounts of knowledge and power. This evidence points conclusively to God. What else could it be?

5. SCIENTIFIC OBJECTIONS TO THE *KALAM* COSMOLOGICAL ARGUMENT

Inevitably, there is always the "grab bag" of cosmological theories which are haphazardly and randomly appealed to in the quest to answer the conclusion set out in the *kalam* cosmological argument. We have already seen philosophical support for the impossibility of an infinitely old universe and scientific support to sustain the Big Bang theory. What non-theists generally begin to do is to grant the veracity of the scientific evidence for the Big Bang and either reinterpret the nature of the singularity or opt for a cosmology that entails an infinitely old universe consistent with observations about the universe's expansion. In this section we will briefly examine each view.

(i) *The oscillating/cyclical universe.* Astrophysicists have suggested a compatibility of features between the notion of a cosmological singularity with an infinitely old universe in the cosmological theory of oscillation. This theory supposes that our universe's origin in the singularity is simply one occasion out of an infinite series of past universes produced from singularities of their own. This is to say that there have been universes in the past that have exploded from a singularity, expanded into a universe, and re-contracted back into an infinitely dense point whereby the next universe would "bounce back." The problems with this model entail both scientific and philosophical difficulties too great to be reconciled. First, such a cyclical universe would have to be explained in terms of natural laws. But there is no known natural laws that offer real support for a "bounce back" from a re-contracting universe to a new one. Dr. William Craig cites a personal letter from Dr. Beatrice Tinsley of Yale University as stating:

... even though the mathematics *says* that the universe oscillates, there is no known physics to reverse the collapse and bounce back to a new expansion. The physics seems to say that those models start from the Big Bang, expand, collapse, then end.⁽³⁵⁾

Secondly, if we consider what happens when a universe collapses and re-contracts it appears that our current observations betray those conclusions. As a universe begins to contract all of the celestial bodies begin to draw closer to each other. This means that when black holes begin to engulf their celestial neighbors there would eventually be an uneven distribution of mass. So what accounts for the currently observed uniform and even expansion derived from the singularity created by a former contracting universe? Again, the question remains unanswered. In addition, one may properly question the ability of re-contraction at all. If the universe does not possess the necessary mass to reverse the escape velocity of celestial bodies then there is no reason to imagine that the universe would be capable of re-contraction. For this reason modern astronomy seems to be sympathetic to a universe that is open rather than closed.⁽³⁶⁾

(ii) *Stephen Hawking and the unbounded universe model*. Perhaps no theoretical physicist since Einstein has been revered as much as Cambridge University's Stephen Hawking. In his much celebrated book *A Brief History of Time* Hawking grafts his theory of the unbounded universe in a palatable manner for even the most basic astronomer. The book concentrates on the ontologies of time and space. The profound implication, not to mention the atheistic appeal, is the conclusion drawn in Hawking's theory of the unbounded universe. Hawking states:

... if the universe is completely self-contained, with no singularities or boundaries, and completely described by a unified theory, that has profound implications for the role of God as Creator.⁽³⁷⁾

This *caveat* is placed on his theory only to avoid concluding atheism from his model. Instead, he only wishes to remove the astrophysical evidence pointing toward the existence of God notwithstanding other considerations.⁽³⁸⁾ The conclusion one draws on the "role of God as Creator" is supposed to be the sole responsibility of the reader. Since it attacks the *kalam* directly we need to entertain some problems with the unbounded universe model.

Hawking theorizes a status for time not latent in or necessarily implied by a quantum cosmological singularity. Instead of viewing time as an absolute progression of temporal segments (whether differentiated or not), Hawking perceives time to be "imaginary" where "there is no difference between the time direction and the directions of space."⁽³⁹⁾ This "imaginary time" is supposed to be a "well-defined mathematical concept" that is admittedly a "[mere] mathematical device (or trick) to calculate answers about real space-time."⁽⁴⁰⁾ Well-defined or not there is no reason to replace "real" time with the so-called "imaginary" time if it does not correspond to anything in the real world. I would summon the obvious metaphysical difficulty with such a move by noting that time is just fundamentally different than space being categorized by the terms *before*, *after*, and *simultaneous with*. It makes no difference whether a mathematical "trick" can be constructed or not, there is no counterpart of an invented concept of time in the real world. Besides, what do we make of "imaginary" time when it makes just as much sense to posit "imaginary" meters or "imaginary" inches? There is no confinement for such a fertile imagination if "anything goes" is the battle cry of theoretical physics. Secondly, Hawking is forced to use imaginary numbers for his time coordinate equations. In order to avoid the technical difficulties of a particle's travel of all possible histories in Feynman's sum over histories approach, Hawking incorporates imaginary numbers in the place of real ones. In plain English, Hawking has just performed a "bait-and-switch" method where he is able to doctor his equations that would normally have resulted in a historical Big Bang singularity in order for the singularity to magically vanish. Hawking thus admits that "the distinction between time and space disappears completely" in this model.⁽⁴¹⁾ Although this is an interesting trick, we are still left with the problem of translating such a theory to the real world. Is the World Series really *after* a season of baseball games or is it all imaginary? What is *before* and *after* in an imaginary time context? I find no appeal in Hawking's metaphysical mistakes. Therefore, it seems that Hawking's unbounded universe model fails as a convincing explanation.⁽⁴²⁾

6. ATHEIST MICHAEL MARTIN ON THE DEDUCTIVE *KALAM* COSMOLOGICAL ARGUMENT

Michael Martin, professor of philosophy at Boston University, has become somewhat of an icon for skeptics, agnostics, and atheists in recent years. Martin is well known for his two works on the subjects of atheism and Christianity entitled *Atheism: A Philosophical Justification* and *The Case Against Christianity*. The former book is a voluminous defense of *negative atheism* and *positive atheism*.⁽⁴³⁾ But despite the wealth of possible objections we could provide against Martin's works, we will only focus on his critique of the deductive version of the *kalam* cosmological argument as advanced by such men as William Lane Craig and J. P. Moreland.⁽⁴⁴⁾ My purpose for examining Martin's critique is to observe the more common academic attempts to refute the *kalam* argument.

Martin's critique can be grouped under two main headings. (i) The nature of the cause in the *kalam*'s conclusion is undefined and ontologically open; and (ii) There may be a third option for infinite matter to exist transdimensionally and, consequently, no need to infer *creatio ex nihilo* from the *kalam* argument. Let us look at each of these in turn.

(i) *The nature of the cause in the kalam's conclusion is undefined and ontologically open*. Immediately, those who have studied contemporary defenses of the *kalam* argument know right away that the cause must possess certain attributes deduced from the argument itself. This we looked at above. But Craig, for example, explains:

On the basis of our philosophical arguments for the beginning of the universe, we know that he must be uncaused and changeless . . . Since we know nothing about God's having been active prior to physical creation, we may assume for simplicity's sake that time (or at least differentiated time) begins at creation and that God without creation is change-less. Since he is changeless without creation, he must be either timeless without creation, or at least "relatively timeless," to borrow the expression of one philosopher; that is, he exists in an undifferentiated time prior to creation. Since he is causally related to the world, he must be in time subsequent to creation (given that the "flow" of time is in some sense real). Since he is changeless without creation, he must be immaterial, since matter inherently involves change. Being immaterial, he must be spaceless as well as timeless. Since he created the universe from nothing, we know that he must be enormously powerful, if not omnipotent. Since he brought the universe into being without any antecedent determining conditions and fine-tuned it with precision that literally defies comprehension, he must be both free and unimaginably intelligent, if not omniscient.⁽⁴⁵⁾

Craig argues that the very nature of the cause, as far as the *kalam* argument is concerned, is disclosed by the implications of God being causally prior to physical time and space. And this just makes sense. Obviously if little Joey were not inside his house anywhere when his mother came looking for him, we could deduce that Joey must be *outside* of the house somewhere. Likewise, if I were in a chemistry lab and created the *first* and *only* plasmatic substance, we could infer that whatever I am made of must not be plasma. Similarly, God is *outside* of physical space and must be transcendent to it. Since God created the *first* and *only* physical space-time continuum, He must not be physical or temporal (in a differentiated sense). But if all of this is true, then what do we do with puzzling statements like "It should be obvious that Craig's conclusion that a single personal agent created the universe is a non sequitur" and "It is hard to see . . . why the creator or creators of the universe must be greater than the universe itself . . . experience by no means uniformly supports the hypothesis that a creator is greater than its creation"⁽⁴⁶⁾ advanced by Martin?

Martin suggests that the *kalam* argument *at best* only opens the door to a dilemma: either the universe was created by one agent or multiple agents.⁽⁴⁷⁾ Allow me to make two observations from Martin's beliefs here. First, whatever the number of agents that may be inferred from the *kalam* argument, the fact remains that atheism is not an option.⁽⁴⁸⁾ Secondly, Occam's Razor applies here and requires that we not postulate more causes than is warranted by the evidence. So far, we see evidence for a timeless, changeless, and incorporeal intelligence. Any additional accidental features added to the *kalam*'s argument only unnecessarily complicates the matter. Further, I think that Craig has already given reasons to surmise the cause's ontological status and so renders Martin's criticism that the cause is not necessarily "greater than the universe itself" useless. But Martin argues analogically that experience precludes such a prerequisite. He states, "Parents, for example, give birth to children who turn out to be greater than they are."⁽⁴⁹⁾ However, I think Martin has argued incorrectly. In the case of the cause we are discussing its essence and nature compared to that of the universe, and in Martin's analogy he is discussing the *performance* and *ability* of the child to that of the parents. Martin's use of "greater" gives him the much needed ambiguity to use his analogy. But Craig does not argue for the cause's ambiguous "greatness" but for its distinctive category of essence and nature from that of creation's.

The next criticism Martin gives against the nature of the cause is his belief that a personal agent is not necessarily implied by the *kalam*'s evidence. Martin says:

In ordinary life and in science one would be ill-advised to appeal *always* to the choice of a personal agent to explain what happens when two events are equally likely and one occurs . . . Perhaps some nonpersonal causes are nontemporal and yet create events in time.⁽⁵⁰⁾

What he appears to be advancing is a general situation that could opt for either a personal or an impersonal cause. The cause of the universe could just as equally be impersonal as well as personal. Martin then sees no problem, given the equiprobable choice of an impersonal cause over a personal cause, rejecting the seemingly arbitrary decision to surmise a personal cause. But the problem which seems to be glaring at me is that we are not looking at a general situation of causality somewhere in an indefinite causal chain (notwithstanding Thomas Aquinas's First Way). Instead, we are looking at a *first* cause in the particular

situation of the universe's coming into temporal existence. It seems more probable that, in the particular case of the universe, the cause must be personal. Martin has not critiqued this position accurately. This would be like criticizing an excavated manuscript as being the product of a plagiarist who may simply have borrowed his ideas from another writer. In the case of a manuscript *in general* this is certainly possible. But what do we say about the *particular* case of the very *first* manuscript to be excavated? It cannot be the product of a plagiarist if his work is the first one. And if the ideas are unique then the manuscript is more likely written by a person with exclusive originality. It seems apparent that Martin's criticism here fails miserably.

(ii) *There may be a third option for infinite matter to exist transdimensionally and, consequently, no need to infer creatio ex nihilo from the kalam argument.* Martin's criticism here is twofold: (a) Although infinity possesses odd properties, it does not imply logical impossibility; (b) There are practical possibilities for actual infinities. In order to see the full dimension of Martin's objections, let us look at each one in turn.

Martin makes the peculiar comment, in agreement with Craig, that "the concept of an actual infinity in pure mathematics is perfectly consistent" and, contra Craig, that such objections to real actual infinities fail "to show that there is anything logically inconsistent about an actual infinity existing in reality."⁽⁵¹⁾ In his criticism, he focuses solely on the coherence of successive addition to the point of an actually completed set. We can certainly consent to the first statement about logical possibility, but the second statement is ignorant of the objections already given. Martin reconstructs the typical argument against the real possibility of adding members to total an actual infinity:

(1) For any point, it is impossible to begin at that point and construct an actual infinity by successive addition.

(2) In order to construct an actual infinity by successive addition, it is necessary to begin at some point.

(3) Therefore, an actual infinity cannot be constructed by successive addition.⁽⁵²⁾

As I read the argument structured by Martin, I see no genuine connection to what Craig and others have argued. Instead, critics of actual infinities by successive addition maintain that it makes no difference if one begins at some point (premises 1 and 2). This evades Martin's objection that "there is an alternative - namely, that an actual infinity can be constructed by successive addition if the successive addition is beginningless."⁽⁵³⁾ The premises reconstructed by Martin are incorrect and should be constructed how Craig initially stated the argument:

(1') The series of events in time is a collection formed by adding one member to another.

(2') A collection formed by adding one member after another cannot be actually infinite.

(3') Therefore, the series of events in time cannot be actually infinite.⁽⁵⁴⁾

The careful reader will notice that it is irrelevant whether one actually begins at any point in the counting. The problem lies in the impossibility of completing an actual infinite set of numbers via successive addition under *any* circumstances. To see this, just imagine someone who has been counting from infinity (where there is no beginning point) and is about to conclude today by approaching his exhaustive destination:

. . . -3, -2, -1, 0

But we must ask ourselves why the man ended today instead of yesterday. Remember that subtracting one member from an infinite set still yields an infinite cardinal number. This means that the man should have finished yesterday, or two days ago, or five days ago, or 100 days ago, and so on to infinity. The point is, if he has been counting from infinity then he should have finished already. The initial question we are asking is: How is it possible to traverse the infinite set of discrete segments whether beginning or not? The question implies no consistent answer which is why such a notion is absurd. If you cannot count *to* infinity then it makes no sense to suppose that you can count *from* infinity either.

The final problem of Martin's objections is his notion that *creatio ex nihilo* is not implied by the *kalam* cosmological argument. He says, "According to [the] argument, the universe is not eternal but was created. From this it does not follow that the universe was not created out of something else."⁽⁵⁵⁾ There are two approaches to this criticism that I find convincing. First, the problem of an actual infinite is only *extended* and not *eliminated*. It makes no difference if we say "Matter/Energy began to exist" instead of "The universe began to exist" since the objections to an actual infinite still apply. Secondly, if matter existed transdimensionally to our space-time manifold then we have to wonder how it ever "decided" to create a life-permitting universe. We still have to explain the transmutation of matter to multi-phasic material with the intent of forming human life. Although the infinity paradox seems squelched by positing eternal matter and by putting it in the same category as God, it still does not explain why or how the universe was caused by transdimensional matter. Worse than that, we still have the problem of a temporal effect by an eternal cause. Remember our illustration about intense temperatures causing water to boil indefinitely. If the cause is material and eternal, then it could only cause an eternal effect. This is why the cause of the universe must be personal and free to create temporally.

Although Michael Martin seems to represent the academic atheist in a basic array of atheistic arguments, he offers no good objections to the deductive mode of the *kalam* cosmological argument. If Martin represents the general thinking atheist, then Christians have little to be concerned about. His arguments are undoubtedly answerable and demonstrate that the *kalam* argument ought to be a serious consideration in the non-theist's pursuit of a rational world view.

7. CONCLUSION AND PERSONAL APPLICATION

The evidence presented in this essay is not intended to be somehow transmitted and delivered in its entirety to everyone who challenges God's existence. We must be sensitive to the audience we are trying to reach. Sometimes a simple explanation will suffice. It is only when we encounter knowledgeable (and may I say haughty) non-theists do we need to concern ourselves with extensive and technical areas of apologetics. I remember an event that occurred during my sophomore year in high school in physics class. When we were studying the basic concepts of cosmology (the Big Bang in particular) my friend asked me how anyone could believe in God. I just looked at him and said that it seemed to me that if the universe sprang into existence then something must have caused it. Couldn't this be God? He just sat there and pondered the reply and looked back at me said, "Good point." Now, I do not expect anyone who hears the *kalam* cosmological argument to just bow down and receive it. But I do believe that God, as seen in the Bible, actively uses our well-reasoned answers to compel non-theists to Christianity. As such it is my prayer and hope that the reader will master the information in this essay and begin sharing with skeptics and non-believers in order to fulfill the Great Commission instituted by Christ to "Go ye therefore, and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost" (Matt. 28:19; KJV).

This essay has surveyed the use of reason in attempting to convince non-theists of the truth of God's existence. We have also seen the structure of inductive and deductive arguments with a view toward the *kalam* cosmological argument's basic mode. When assessing the philosophical and scientific arguments in support of the *kalam*'s premises it seems more likely than not that God truly does exist.

END NOTES

1. Once someone has constructed an inductive argument, then notice that the only remaining mystery is whether or not it is *strong* or *weak*. Just think of strength in terms of percentage. If we say that an argument is strong then we suggest that it has *at least* a 51% probability of being true. Likewise, a weak argument may be seen to have *less than* a 51% probability of being true. The only stipulation is that an inductive argument may never have either 100% support or 0% support. To see why, just substitute "100%" with the word "all" or substitute "0%" with the word "no" and, *voila*, you will see a deductive argument appear before your eyes.

2. Robert Audi, ed., *The Cambridge Dictionary of Philosophy* (New York: Cambridge University Press, 1995), p. 398.

3. Ed L. Miller, *Questions That Matter: An Invitation to Philosophy* (Colorado: McGraw-Hill, Inc., 1992), p. 221.

4. It must be noted that I am not defending the exclusive veracity of idealism over and above any rival theory of epistemology. Instead, I am synthesizing the best attributes of *both* idealism and empiricism. But as long as we understand that a *tabula rasa* is no longer a viable understanding of the pre-noetic intelligence, then we have a plausible reason to believe that causation is not the collection of particularly observed occurrences.

5. Stuart C. Hackett, *The Resurrection of Theism* (Chicago: Moody Press, 1957), p. 57.

6. J. Y. T. Greig, ed., *The Letters of David Hume* (Oxford: Clarendon Press, 1932), I. 187. This statement is taken from a letter from Hume to John Stewart, February 1754.

7. Edward Tryon, "Is the Universe a Vacuum Fluctuation?" *Nature*, 246 (1973), pp. 396-7.

8. D. Atkatz and H. Pagels, "Origin of the Universe as a Quantum Tunneling Event", *Physical Review*, D25 (1982), pp. 2065-6.
9. Nick Herbert, *Quantum Reality: Beyond the New Physics* (New York: Doubleday, 1985), pp. 158-64.
10. Frederick C. Copleston, *A History of Philosophy*, Volume 1 (New York: Doubleday, 1993), pp. 54-7.
11. See Aristotle, *Physics*, 3.5.204b1-206a8. Some have charged that Aristotle was contradicting himself by asserting the fact that potentiality entails the idea that the actual can eventually be achieved. However, Aristotle's definition denotes a magnitude capable of being indefinitely divided or extended, not that the infinite would be achieved.
12. This example is cited in Abraham Fraenkel, *Abstract Set Theory* (Amsterdam: North-Holland Publishing Company, 1961), p. 6.
13. See Bertrand Russell, *The Principles of Mathematics*, 2nd ed. (London: Allen & Unwin, 1937), pp. 358-9.
14. Quentin Smith, "Infinity and the Past," *Theism, Atheism, and Big Bang Cosmology*, William L. Craig and Quentin Smith, eds. (Walton Street, Oxford: Oxford University Press, 1993), pp. 87-8.
15. For more information about sets and set theory, see Charles C. Pinter, *Set Theory* (Reading, Mass.: Addison-Wesley, 1971), p. 138.
16. The quantity of numbers in a set, subset, or proper subset is called the *cardinal number*.
17. William Lane Craig, "Time and Infinity," *Theism, Atheist, and Big Bang Cosmology*, p. 100.
18. *Ibid.*, p. 101.
19. *Ibid.*
20. It would appear to me that the failure of an actual infinite to succumb to the basic principles of mathematics is why the infinite remains forever untouched by finite beginning points.
21. Cf. *ibid.*, pp. 104-5.
22. Quite often, Christians mistake the theory of evolution to be supporting evidence against the existence of God. This is not the case. Instead, evolution is intended to deplore creationist theories that human beings arose onto the scene directly without any gradual procession of natural processes leading to the formation of *homo sapiens*. As a Christian, I certainly reject evolutionary theory. But my reasons are not solely theological but scientific in nature.
23. See P.C.W. Davies, "Spacetime Singularities in Cosmology," in *The Study of Time III*, eds., J.T. Fraser, N. Lawrence, and D. Park (Berlin: Springer, 1978), pp. 78-9; John Barrow and Frank Tipler, *The Anthropic Cosmological Principle* (Oxford: Oxford University Press, 1986), p. 442; Fred Hoyle, *Astronomy and Cosmology* (San Francisco: W.H. Freeman, 1975), p. 658; Robert Jastrow, *God and the Astronomers* (New York: W.W. Norton, 1978), p. 28, 112-3.
24. For a good layman's outline of the Big Bang theory and the observational and theoretical elements involved, I recommend Fred Schaaf, *Seeing the Deep Sky: Telescopic Astronomy Projects Beyond the Solar System* (New York: John Wiley & Sons, Inc.; 1992), pp. 49-55.

25. This controversy is encapsulated in Michael D. Lemonick and J. Madeleine Nash, "Unraveling the Universe" *Time Magazine*, March 6, 1995, pp. 76-84.
26. For a good critique of the *steady-state*, *oscillating universe*, and *quantum* cosmological models see Ivan R. King, *The Universe Unfolding* (San Francisco: W.H. Freeman, 1976); Allen Sandage and G.A. Tammann, "Steps Toward the Hubble Constant. VII"; [Shandon Guthrie, "A Reply to Taner Edis: The Beginning of the Universe was Caused By God"](#).
27. One other Law is generally discussed in scientific circles. This Law is called the *Zeroth Law of Thermodynamics* and it supposes that if two bodies are in thermal equilibrium with a third body then all three bodies are in equilibrium with each other.
28. See Alan Isaacs, ed., *A Dictionary of Physics* (New York: Oxford University Press, 1996), pp. 132, 427-8.
29. Beatrice Tinsley, "From Big Bang to Eternity?" *Natural History Magazine*, October 1975, p. 105.
30. P.C.W. Davies, *God and the New Physics* (New York: Simon and Schuster, 1983), p. 11.
31. Robert Jastrow, *God and the Astronomers* (New York: W.W. Norton, 1978), p. 116.
32. Copleston, *History*, p. 168.
33. Isaiah 14:12; Ezekiel 28:14-15; Revelation 12:3-4.
34. Copleston, *History*, p. 51.
35. William Lane Craig, *Reasonable Faith: Christian Truth and Apologetics* (Wheaton, Illinois: Crossway Books, 1984, revised 1994), p. 103.
36. Several factors are taken into consideration in the calculation of the density parameter (**W**) necessary to close the universe: the deceleration parameter, the age of the universe, the density of galaxies, and the presence of the abundance of deuterium. Each consideration points unequivocally toward an open universe with a value of **W** being less than 1.
37. Stephen Hawking, *A Brief History of Time* (New York: Bantam Books, 1990), p. 174.
38. Further down the page from where the same citation was made Hawking admits, "Even if there is only one possible unified theory, it is just a set of rules and equations. What is it that breathes fire into the equations and makes a universe for them to describe? . . . does it need a creator[?]" (Ibid.).
39. Ibid., p. 134.
40. Ibid., p. 134-5.
41. Ibid., p. 134.
42. For a wider scope of objections to Hawking's unbounded universe theory see Shandon Guthrie, "A Response to Taner Edis: The Beginning of the Universe was Caused by God."

43. Dr. Martin makes the distinction between *negative atheism* and *positive atheism* in order to distinguish between arguments advanced by theists with philosophical answers (negative atheism) and pro-active arguments promoting general atheism (positive atheism).

44. For a detailed critique of competing versions of the *kalam* argument, see *Atheism: A Philosophical Justification* (Philadelphia: Temple University Press, 1990), pp. 106-124. Martin's notable work here is to be commended since it attacks those arguments that have been launched by philosophical theists and neglected by almost every skeptic. Usually, atheists attempt to "refute" theistic claims with trivial responses. But Martin's volume shows that theists have to be on their academic toes. In my opinion, I see no convincing arguments proposed in *Atheism* and see no good reason to reject either contemporary or traditional apologetics. I see Martin grasping at straws in his evaluations of theistic arguments and only succeeds at showing that if one thinks hard enough, there may just be enough space to crawl out of the realm of Christian apologetics.

45. Craig, *Reasonable Faith*, p. 119.

46. Martin, *Atheism*, p. 103.

47. Ibid.

48. Martin makes the statement "for all he shows, there may have been trillions of personal agents involved in the creation" (Ibid.) and seems to inadvertently admit that *at least one creator was involved*. This excludes atheism as an option *a priori*. But, how does this vindicate negative atheism? If the argument grants a personal cause or multiple causes, then how does atheism possess any veridicality subsequent to this admission?

49. Ibid.

50. Ibid., p. 104.

51. Ibid., p. 105.

52. Ibid.

53. Ibid.

54. Craig, *Reasonable Faith*, p. 98.

55. Martin, *Atheism*, p. 104.