

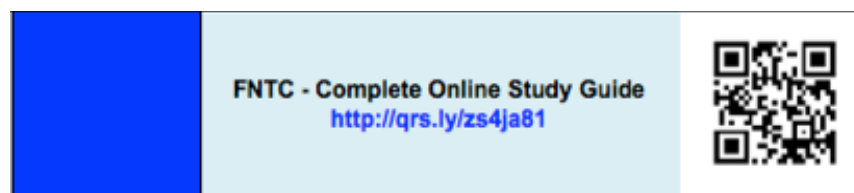
From Nothing to Cosmos: **THE WORKBOOK +**

Answers to Review and Discussion Questions

This free set of answers is posted for the use of teachers and students alike. While it may seem wrong to give the students all of the answers to the study questions, we believe it is ultimately most important for everyone to have the correct answers. If the students are industrious enough to come find these answers, at least they are working to get it right. We will hope they are creative enough to not copy the answers word for word. If they do, they still had to do the work.

To the above point, the answers we will give will be succinct. Sometimes, only one sentence (bare minimum answers). The answers will come directly from the **Workbook +** or the **FNTC Study Guide**. We will also give you the page in the workbook or study guide where the answer is found so more information may be obtained with a minimal amount of effort. If you see (W+ 2), the answer is from the **Workbook +** on page 2. Answers from the Study Guide will be referenced as, (SG 2) for Study Guide, page 2. If you do not have a study guide, it is available online along with this set of answers.

If you need to access the study guide, simply click on the QR code at the bottom of this page using a QR (barcode) reader. If you should have a question about our supplied answers, feel free to access the online forum using the access code on the inside cover of your **Workbook +** or contact us using the “contact” form on our website, magiscenter.com.



Study Guide

Episode One

Chapter 1

What Science Can and Cannot Do

1. What are the purpose and limitations of the Scientific Method?
 - A) “The Scientific Method” is the name given for a system scientists use to provide evidence for or against various hypotheses. The Scientific Method always has to begin with observational (empirical) data. (W+ 2)

2. Why is it harder for science to disprove something rather than prove something?
 - A) Scientific Method is limited to studying only observable realities (physical realities within our universe). (W+ 2) Therefore, in order to disprove anything, we must first be able to observe it.

3. How does the example of the existence of aliens demonstrate this?
 - A) While we can prove the existence of aliens by observing just one, we cannot rule out their existence simply because we have never seen one. (W+ 3)

4. Why is it even more impossible for science to disprove God than aliens?
 - A) God transcends (is beyond) the universe, but science can only gather data from observing what is within the universe. Therefore, we must recognize that the Scientific Method (and therefore, science) cannot be used to disprove God. (W+ 3)

5. Why can't science know everything about the universe?
 - A) In a word: no. Science is an inductive discipline (going from particular observations to a general theory). There may be new discoveries made in the future that would require changes to existing theories. Here's the problem--scientists cannot know what they do not know until they have discovered (observed) it. Even if it were possible, hypothetically, for scientists to gather vast amounts of information about the universe, they couldn't know how much data was still missing... (W+ 3&4)

6. What can science tell us about things outside of our universe?
 - A) Absolutely nothing. At least for today, we can only observe what is within our universe. See the answer to question number 4 above.

7. What kind of evidence could science give us for a Creator?
 - A) Science can provide evidence that there is a limit to past time, implying our universe had a beginning. Prior to a beginning, the universe (and even physical time itself) did not exist—it was literally nothing. (W+ 4)

8. What does it mean that before our universe existed, it was *nothing*?
 - A) ... when the universe was nothing (before the beginning), it could not have moved itself from nothingness to something, because it was

nothing and capable of only doing nothing. **Nothing is the absence of everything.** (W+ 4&5)

9. What can *nothing* do?

A) What can nothing do? Nothing! “Only Nothing comes from Nothing” dates to Parmenides from the late 6th or the early 5th Century BC. (W+ 4)

10. If the universe can't create itself, what is required for it to exist?

A) If we don't sneak something into nothing, then the only thing nothing can do is nothing. Therefore, something else--beyond the universe—would have to have moved the universe from nothing to something. Many physicists and philosophers call this a Creator or God. You can plainly see, a beginning indicates a Creator. (W+ 4)

“Stephen Hawking, in his book, *The Grand Design*, said “Because there is a law such as gravity, the universe can and will create itself from nothing.” Here is the problem--a law, such as gravity, is not nothing. Nothing is the absence of everything, but the law of gravity is clearly something. Such attempts to sneak something into nothing (pre-beginning of reality) are both contradictory and incoherent.”

From, *The Workbook +*, Page 5

Episode One

Chapter 2

The Big Bang Theory and the Modern Universe

1. Explain the Big Bang Theory.
 - A) From all of this comes Lemaître's conclusion that an initial "Creation-like" event must have taken place. He proposed that the universe came from an initial point that he referred to as the "Primeval Atom".. It would later become known as, "The Big Bang Theory"... (W+ 9)
2. Who originated the hypothesis of the Big Bang (originally the "Primeval Atom")?
 - A) We will learn about the Big Bang Theory and the Belgian priest, Fr. Georges Lemaître, who first proposed it. (W+ 8)
3. Why is an expanding universe important in proving there was a beginning?
 - A) Prior to Lemaître's discovery, Einstein, and other scientists, believed the universe was in a static state (neither expanding nor contracting) and had been so forever. Proving the universe is expanding also proved it could not be infinite time back to the beginning of the universe. (SG 13)
4. What kind of proof is available to show the universe is expanding?
 - A) In this section, we will discuss Edwin Hubble's use of red shifting to verify Lemaître's discovery of an expanding universe. We will then discuss Penzias' and Wilson's discovery of a universal radiation (from the Big Bang) which further verifies Lemaître's theory. (W+ 8) This is also confirmed by more recent data from the two COBE satellites, the WMAP satellite, and the Planck satellite. (W+ 11)
5. How did Hubble and Lemaître prove that galaxies farther away were moving faster?
 - A) Let us now briefly consider the proof Hubble used to substantiate that galaxies farther away were moving away faster than galaxies nearby. We have already mentioned this as "red shifting". (W+ 10)
6. How did proof of an expanding universe influence Einstein's theory of relativity?
 - A) In the end, and with the help of Hubble's findings, Einstein was convinced that Lemaître was correct in his theory and he publicly endorsed it. Einstein then integrated it into his General Theory of Relativity (GTR). (W+ 9)
7. What are the three major components of our universe?
 - A) 1) Visible Matter @ 4.9%
2) Dark Matter @ 26.8%
3) Dark Energy @ 68.3%

8. What is the significance of all galaxies moving away from one another?

A) ...we said there was a linear relationship to our expanding universe. What both Lemaître and Hubble noted was, the farther a galaxy is from us, the greater the recessional velocity (the speed of an object going away from us). Like an expanding balloon with dots on it, the dots all move away from one another as the balloon expands. The skin of the balloon is like our spatial continuum. Believe it or not, space stretches and grows – which makes the universe stretch and grow. (W+ 9)

9. Is space an empty vacuum?

A) The simple answer is, No! Space, in the General Theory of Relativity is a highly dynamic field. As the density of mass-energy within it changes, so does the shape of the field. It might be compared to pinching a table cloth and slowly raising it by the pinched point. As you pull it up, the most altered point is where you have pinched it but the rest of the table cloth is also altered. Space is a continuum and what happened in one area affects the rest. (W+ 10)

“There has never been a better time for finding scientific evidence pointing to the existence of God.”

Fr. Robert J. Spitzer, S.J., Ph.D.

Episode One

Chapter 3

The Beginning -- From Space -Time Geometry Proofs

1. What does the term, “eternally static universe” mean? What are the alternatives?
 - A) Remember, at one time, Einstein thought that our universe was eternally static, i.e. not expanding or contracting. We know better than that today. A twist on the idea of a permanently static universe is a universe that was static for an infinite amount of time into the past and then suddenly exploded and starting expanding. Physicists call this the “cosmic egg” theory. There is no scientific evidence to support this theory, and a good deal of evidence against it. (W+ 16)

2. What is meant by a “multiverse”?
 - A) There are many multiverse theories. For example, Andre Linde proposed a “Chaotic Inflationary Multiverse” which he believed might allow the past to be infinite. This theory describes a recurring cosmic event whereby bubble universes are created and belched out into the multiverse on a continuing basis. In this theory, our universe is but one of many bubble universes...Can the multiverse be eternal? ... the Borde-Vilenkin-Guth Proof shows that no hypothetical multiverses can be eternal into the past – they must all have a definitive beginning. (W+ 17)

3. What is meant by a “bouncing universe”?
 - A) The hypothesis runs basically like this: the universe expands to a maximum limit. At this juncture, the universe begins to collapse and moves ever more rapidly to what might be called a “big crunch,” after which a bounce occurs, allowing for another expansionary phase. According to this theory, the universe could have been bouncing for an infinite time – seemingly averting a beginning. As we will see below, there is a virtual mountain of evidence against this theory... (W+ 17)

4. How can a balloon be used to simulate space-time geometry?
 - A) What both Lemaître and Hubble noted was, the farther a galaxy is from us, the greater the recessional velocity (the speed of an object going away from us). Like an expanding balloon with dots on it, the dots all move away from one another as the balloon expands. The skin of the balloon is like our spatial continuum. Believe it or not, space stretches and grows – which makes the universe stretch and grow. The dots on the balloon are Like galaxies – the more the balloon expands (the more the spatial continuum stretches and grows), the more the galaxies move away from each other. (W+ 9)

5. How many conditions are required in the B-V-G Proof?
 - A) The 2003 Borde-Vilenkin-Guth Proof (AKA - The B-V-G Theorem) –

has only one condition (the universe must have a Hubble expansion of greater than zero); physics of the universe is not relevant. If this one condition is met, the universe must have had a beginning. (W+ 19)

6. What is the major premise of the B-V-G Theorem?

- A) In 2003 Borde, Vilenkin, and Guth came together to develop the most elegant and vastly applicable proof – now called “the B-V-G Theorem.” They showed that every universe or multiverse having an average Hubble expansion greater than zero must have a limit to past time – a beginning. (W+ 20 & 21) (See QR32 for complete proof - SG pages 31/36 – Q45)

7. What observations are used to prove the B-V-G Theorem?

- A) See Episode 1, Chapter 2, Question/Answer 4

8. If there really is a beginning to physical reality, what are the consequences?

- A) By now you will have a pretty good sense of the consequences of proving a beginning to virtually all major known cosmologies – first, prior to the beginning of our universe – and all the other cosmologies mentioned above – physical reality would have been nothing. Secondly, if we don't sneak something into nothing, then nothing can only do nothing. Therefore, physical reality could not have moved itself from nothing to something. So, where does that leave us? It seems very likely that something else – something transcendent – would have to have created physical reality out of nothing. This we call a Creator or God. (W+ 21) or (SG 36 – Q47)

9. If there is so much evidence for a Creator, why do you think some scientists choose to declare themselves as atheists?

- A) As we saw above, this atheism cannot be justified on scientific grounds, because scientific methodology must be based on observational evidence. Furthermore, the evidence for a beginning of physical reality from the Borde-Vilenkin-Guth proof militates against this conclusion. So why would scientists be atheists? It cannot be for scientific reasons, and so it must be for personal reasons. Some scientists simply prefer or choose to believe that there is no God in the face of the above evidence. Indeed, they bend over backwards to propose incredible theories to get themselves out of the above conclusion – so much so that it is easier to believe in an unseen God than to believe in these highly unlikely speculative alternative hypotheses.

As we shall see below, there are five major personal reasons why any individual might choose to believe in atheism (see Episode Four, Chapter 3). **Scientists are no different from other individuals – they choose to believe in atheism for non-scientific, personal reasons. (W+ 21 – 22)**

Episode Two

Chapter 1

The B-V-G Proof for a Beginning of Expanding Universes

- 1) Who were the scientists who developed the B-V-G Proof?
 - A) Drs. Arvind Borde, Alexander Vilenkin and Alan Guth (W+ 19)
- 2) How can a rubber band be used to simulate the linear relationship of the expansion going on in our universe?
 - A) As you might recall, we put three dots on a rubber band, one at zero, one at one inch, and one at two inches. When we stretched the dot which was at two inches to the four inch mark, we noticed that the dot at the one inch mark only moved to the two inch mark – only half as far as the more distant one.
... imagine that the rubber band is like space and the dots are like galaxies. If there is twice as much space to stretch and grow, then the recessional velocity of the farther galaxy will be twice as great as that of the nearer galaxy. (It is a purely linear relationship)
- 3) How would you describe recessional velocity?
 - A) The speed of something going away from me (SG 32a)
- 4) How would you describe relative velocity?
 - A) The velocity of a body (like a rocket) “relative” to another moving body (like a galaxy) it is approaching. (W+ 26)
- 5) What are your thoughts on the simplicity of the B-V-G Proof?
 - A) I think it is an amazingly simple proof (only one condition) for such a complex universe. What do YOU think?
- 6) Do you think the B-V-G Proof would have any effect on our society if it were more widely understood?
 - A) Think about it. Okay, you are on your own here...run with it.
- 7) Why do you think the B-V-G Proof is not more widely known? What can be done about that?
 - A) Do you care? If not, maybe that is the root of the problem in our society. Are we being misled by atheist’s false claims? What do you think can be done about educating our society to the true science that indicates a beginning and a Creator? Do you care?
- 8) What would be the maximum relative velocity going into the finite past?
 - A) most physicists believe that the upper limit to velocity in our universe is the speed of light (300,000 kps or 186,200 mps). (W+ 27)

9) Why must there be a maximum speed in the universe (currently thought to be the speed of light &, yes, this is the answer to the previous question)?

A) Let's suppose that there is a universe where there is no upper limit to velocity. That would mean, in principle that some forms of energy would be able to travel at an infinite velocity. Think about that for a moment. Suppose some forms of energy in this other hypothetical universe could travel at an infinite velocity. Where would they be? You got it – they would be everywhere in that universe simultaneously. ...every form of energy would have to coexist at every point in that universe simultaneously. But here is the problem – different forms of energy oppose each other – for example, protons are in opposition to electrons, matter is opposed to antimatter, etc. If all of these opposing forms of energy coexisted at every point in the universe simultaneously, the universe would be filled with contradictions – proton-electrons, matter-antimatter, etc.

This scenario is no more possible than square-circles of the same area. Do you think a square-circle (of the same area) can really exist? As you might suspect, it is intrinsically contradictory. The same holds true for all of your quantitative and qualitative characteristics – you can't be 6'3" and 6'4" in the same respect at the same time – a cat cannot be alive and dead at the same time, and so forth. Similarly, opposed states of energy cannot coexist at the same place and time. Without an upper limit to velocity, we would be confronted with an impossible universe filled with contradictions – and inasmuch as it is impossible, it simply cannot exist.
(W+ 28)

10) What is the sole condition required for the B-V-G theorem to apply?

A) ...there is only one condition for the proof to work (namely that the average Hubble expansion be greater than zero) (W+ 29)

“It is said that an argument is what convinces reasonable men and a proof is what it takes to convince even an unreasonable man. With the [B-V-G] proof now in place, cosmologists can no longer hide behind the possibility of a past-eternal universe...There is no escape, they have to face the problem of a cosmic beginning.”

Dr. Alexander Vilenkin, 2007

Episode Two

Chapter 2

The Evidence of a Beginning of the Universe from Entropy

- 1) What is a longer name for entropy (the formal name)?
 - A) “the second law of thermodynamics”. (W+ 32)
- 2) How would you describe entropy?
 - A) The Second Law of Thermodynamics says that in isolated systems (in which there is no outside replenishing source of energy), entropy (basically, a measure of disorder) always increases or stays the same. Physical systems never get more ordered in the long term. (W+ 32)
- 3) What are the odds against our universe having low entropy? (Hint, this is the “Penrose Number”).
 - A) physicist Roger Penrose ruled that out by showing that the **odds of getting low entropy by pure chance at a bounce (and at the beginning of our universe) is $10^{10^{123}}$ to one against** – which is so exceedingly improbable that it is about the same odds as a monkey typing the entire corpus (body of work) of Shakespeare by pure chance (W+ 36)
- 4) Can entropy be reversed?
 - A) Systems have to be ordered to do work but when they do work, they get less ordered. This process is irreversible. (W+ 36)
- 5) How would entropy weigh against the universe being infinite into the past?
 - A) If our universe were infinite in time it would be reduced to a frozen wasteland. (W+ 36)
- 6) If the universe is not infinite into the past, what would that mean?
 - A) Since it is not (infinite in time), it must have existed for only a finite period of time, implying a beginning. (W+ 36)
- 7) Why do most physicists believe that entropy rules out a bouncing universe?
 - A) Thomas Banks and Willy Fischler showed the high likelihood that a collapsing universe would lead to a “black crunch” where the universe would suffer immediate heat death (completely run down) before it even reached the bounce.⁹ In short, entropy put most of the nails into the coffin of the bouncing universe hypothesis. (W+ 36)

- See, “Five Steps from entropy to a Beginning” on W+ 35 for more information

“Scientists are always trying to put something into nothing”

Fr. Robert J. Spitzer, S.J., Ph. D.

its expansion (quickly incinerating everything, which is quite bad for all life forms), or contracted into a black hole (where the entire mass-energy of the universe would collapse into a space of only 10^{-33} centimeters (which is really, really, really small—and has almost infinite crushing capacity—equally bad for life forms). These are two universal constants that could have been any value at the Big bang and they just happened to fall into this narrow anthropic range. This is trillions of trillions of trillions to one against either of them being exactly what they are, by COINCIDENCE? You already looked at the odds against entropy being low at the Big Bang. Wow, we were really lucky. Or... (W+ 43)

5. Who was Sir Fred Hoyle and what did he find amazing? How did this evidence affect his life?

A) The famous physicist and cosmologist Sir Fred Hoyle, of Cambridge University, was an atheist who, when confronted with the truth of the necessity of these “anthropic coincidences,” working in concert with one another to produce carbon at the Big Bang, stated, “Would you not say to yourself, “Some super-calculating intellect must have designed the properties of the carbon atom, otherwise the chance of my finding such an atom through the blind forces of nature would be utterly miniscule?” Of course you would.... A common sense interpretation of the facts suggests that a super intellect has monkeyed with physics, as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature. The numbers one calculates from the facts seem to me so overwhelming as to put this conclusion almost beyond question.” (W+ 43)

6. If it is virtually impossible for all of these anthropic conditions to have happened by chance, what are the (reasonable) options left for us?

A) As Father Spitzer said, “we really threaded the needle at the Big Bang. If the values of the constants did not occur by pure chance (because that is virtually impossible) and those values are necessary for life forms, then there must be another cause - - either a multiverse or a supernatural designer.” It is of interest that the evidence we have discussed in this chapter was enough to convert Sir Fred Hoyle and he was an ardent atheist. (W+ 44)

7. Do you think it is important to explore the improbability of universal constants in our schools today?

A) If this information was enough to convert an atheist scientist to belief in an intelligent Creator, how many others might it help convert?

“If we can find no explanation for the necessity of the conditions and constants of our universe being as they are, then it may be more reasonable and responsible to believe that there is an intelligent designer of our universe than it is to not to believe in that creator.”

Fr. Robert J. Spitzer, S.J, Ph.D.

Episode Three

Chapter 1

The Multiverse vs. Supernatural Design

1. How would you describe a multiverse? (we know this is very complex – it is important)
 - A) A multiverse is a hypothetical configuration proposed by Andre Linde and others as a possible implication of the collapse of a false vacuum in inflationary theory. The hypothesis suggests that little “mini-universes” (bubble universes) could be generated by the collapse of the false vacuum in this “super-universe” (the multiverse). (W+ 48)

2. What are the odds against a bubble universe popping into existence with low entropy?
 - A) Oxford physicist and mathematician Roger Penrose calculated the odds of a universe blossoming into existence with entropy as low as ours. He concluded that the odds against it are $10^{10^{123}}$ to one. (W+ 41)

3. What are some of the three problems with using the multiverse to explain the fine-tuning of our universe? (Here are all three)
 - A)
 1. Multiverses (which are purely hypothetical) have to have a beginning, which means there can only be a finite number of bubble universes in them.
 2. Multiverses violate Ockham’s Razor—in a really big way! Though this is not a fatal flaw, it casts suspicion on the theory because it runs counter to nature’s omnipresent elegance.
 3. As currently conceived multiverses require fine-tuning. This means that the multiverse does not solve the problem of fine-tuning—it only moves it back one step. This is the most problematic of the three problems with multiverses. (W+ 50)

4. How many natural causes have we found for low entropy at the Big Bang?
 - A) the odds of having a universe, which can accommodate life forms are exceedingly, exceedingly, exceedingly small. We need not return to the monkey or the lottery to understand that an anthropic universe (made for life) could not have occurred by pure chance—it is not only scientifically unrealistic—it is unrealistic in every imaginable sense. (The short answer here would be, “none”). (W+ 44)

5. Why do you think scientists promote multiverse theories?
 - A) See answer to question 9, Episode One, Chapter 3. Scientists either really believe in their unsupportable (un-observable and no supporting evidence whatsoever) theories or they are trying to support their personal belief that God does not exist. Either way, they lose as we have already shown that even a multiverse would require a Creator.

“It seems as if we need an intelligent Creator to explain fine-tuning of either our universe—or, if there is one—a multiverse.” (W+ 50)

6. What are your views on the challenges to the multiverse theories?
- A) Personally, I don't see the multiverse as a threat to an Intelligent Creator. It would actually require even MORE *fine-tuning* than our single universe. That would make it less likely to be a natural occurrence and more likely to be a creation of God. (See W+ 50 - - - give your personal thoughts).
7. What can “nothing” do?
- A) You should get this one on your own...
8. What conclusion did we reach about the viability of the multiverse as an explanation for our universe's anthropic coincidences?
- A) See answer to question 3 above. It actually seems to make things worse by increasing the scale of required fine-tuning while not resolving the infinite number of universes since a “beginning is required.
9. With what you know about the multiverse and Ockham's Razor, what do you think about the validity of the following statement from Steven Hawking?
- A) See W+ 49 item “1)” for additional information

In QR 29 (W+ 49), Stephen Hawking says the following: “It seems better to employ the principle known as Occam's Razor and cut out all the features of the theory that cannot be observed.” He implies in this context that the only non-observable entity is an intelligent Creator.

Do you think that Ockham's Razor only applies to God? Does it not also apply to multiverses? Remember, the multiverse is just as non-observable as a transcendent intelligent Creator. If we took Hawking seriously and tossed out all of the theories we cannot observe, this would be a much smaller workbook. **Is it possible that Ockham's Razor applies more properly to a multiverse than to God? Remember, Ockham's Razor is not concerned primarily with non-observability but with the assumption that nature favors elegance—that is, what is least complex, complicated and convoluted.** (W+ 51)

“Maybe the multiverse is the one “super-huge” exception to Ockham's Razor—but then again, perhaps nature is totally consistent and multiverses simply do not exist.”

(W+ 49)

Episode Three

Chapter 2

A response to Two Objections to Supernatural Design

1. How do some skeptics explain our low entropy and low anthropic values of constants without a Creator?

A) It is no surprise that “new atheists” reject supernatural design (fine-tuning, etc.). They insist that the fine-tuning of our anthropic universe has a natural explanation — “It just is!” (W+ 53)

2. How might we respond in light of the Big Bang?

A) One might try, “Do you really think that is a valid explanation of anthropic coincidences like the low entropy of our universe and the anthropic values of our universal constants at the Big Bang?” Those who claim that the value of entropy and the anthropic values of our constants at the Big Bang have a natural cause—must provide data. If they don’t, we are left with the need for some other cause or explanation because those values should not have happened (according to the Penrose number etc.). (W+ 55)

3. When considering explanations for the extraordinary occurrence of our low entropy and anthropic values of constants at the Big Bang, why is the answer “It just is” invalid from both a logical and factual point of view?

A) Factually, the Penrose number alone tells us there were trillions upon trillions (trillions of times over) of results for entropy that could have occurred at the Big Bang that would have precluded life forms from existing. Add to this the multiple Anthropic Universal Constants and the odds of them all being in the narrow range of conditions that would allow life to form and flourish and you have an incredibly robust set of data indicating we really did, as Fr. said, “thread the needle at the Big Bang”.

From a logical point of view, “It just is” is, quite simply, a smoke screen. Making a case against the incredible odds of anthropic conditions, as calculated by some of the worlds top scientists, should require more than what the skeptics are offering in, “It just is”. Logic tells us to seek a reasonable and responsible answer. It just is, is neither of those things.

4. Do you think that the evidence for a Creator is both reasonable and responsible in light of the counter arguments argued by skeptics?

A) If there were 10^{123} chances against low entropy at the Big Bang that life forms would not exist, against one chance that life would exist, shouldn’t there be a better explanation than, “It just is”? (W+ 54).

“There is certainly a far better chance it isn’t just, it just is.”
(W+ 54)

5. How is a natural cause for the universe essentially made a moot point by a beginning?

A) Many new atheists argue that all natural occurrences must have a natural explanation (as if, “It just is” is a natural explanation). As you might remember from Episode One, this is not true because inasmuch as our universe (or even a multiverse) has a beginning, all natural occurrences cannot have a natural explanation—remember, prior to a beginning, all natural explanations do not exist—they are literally, nothing. Recall also, from Episode Two that the Big Bang is a barrier to natural causation; so even if there were something prior to the Big Bang, it would be causally disconnected from it. The idea of asking for a natural cause of occurrences at the Big Bang is like asking “What is the natural cause of an event prior to which there can be no natural cause”-- an obvious contradiction.

(W+ 53)

6. With all of the evidence presented by science in recent decades, why do you think atheists and skeptics continue to be unaware or ignore the facts?

A) The complete question is, “Why does our entropy have such a low value and our constants have anthropic values at the Big Bang, when by every imaginable standard or measure they should not have had those values?” As we said, this requires a cause or explanation. Failure to ask this question in any other line of inquiry would be considered sheer incompetence. Why shouldn’t we think the same thing with respect to inquiry about an intelligent Creator? They ignore the facts and the questions. As previously stated, there really can’t be a scientific reason for ignoring the facts so this has to be a personal choice for reasons we can’t possibly know. It would be easy to be unaware of the facts if they are so caught up in their personal belief system that they ignore the latest in scientific findings, confident they already have all of the answers.

“I used to have a sign hanging in my office: “ ‘In God we trust,’ all others must bring data.” Those who claim that the value of entropy and the anthropic values of our constants at the Big Bang have a natural cause—must provide data.”

Mike Noggle, FNTC: Workbook +

Episode Three

Chapter 3

A response to Dawkins and a Metaphysical Proof of a Creator

1. What does “Metaphysical” mean?

A) In Greek, “meta” means “beyond” (among other things). That works pretty well for what we’re doing here. Webster’s defines metaphysical as, “transcending physical matter or laws of nature.” A metaphysical explanation, then, is one beyond the physical. Often times, such explanations are based upon philosophical (logical) proofs. (W+ 58)

2. How did Dawkins try to show a Designer would be more improbable than what it designed? (Give all three parts of his argument.)

A) So what is Dawkins’ argument? We can set it out in three steps:

1. A designer must be more complex than anything it designs.
2. Whatever is more complex is more improbable.
3. Therefore, a designer must always be more improbable than what it designs.

3. What support does he cite for his theory of a Designer being more complex than what it designs?

A) Though Dawkins was clearly trying to incorporate his statement into something resembling Ockham’s Razor, he failed rather miserably. He cited no support whatsoever. There is an important expression in the rules of logic and evidence — “arbitrarily asserted — then, arbitrarily denied.” In other words, if someone gives no evidence for an assertion, then an opponent need not give any evidence to deny it. The problem with Richard Dawkins’ argument against God, is that its first premise is arbitrarily asserted. In his work *The God Delusion* he gives no evidence for why a Designer would have to be more complex than what it designs. As a good biologist, he probably assumed it. Unfortunately, this assumption is categorically wrong when applied to an uncaused reality (God). (W+ 65)

4. Can you name any philosophers who believe quite the opposite?

A) Aristotle, St. Thomas Aquinas (W+ 59, 60)

5. How would you describe an uncaused reality?

A) It’s a reality that does not have to be caused in order to exist—it exists through itself alone. (W+ 59)

Here are some tougher questions for those who are interested in delving deeper into proofs of God – this is beyond extra credit:

6. Try to describe in your own words why there must be at least one uncaused reality. (Look at the proof in Step One - W+ 59 - for help.)
 - A) All “caused realities” require a cause for their existence. Without at least one “uncaused cause”, the whole of reality would not exist. (W+ 59)

7. Try to describe why “pure existence through itself” can have no differences within itself. Hint – is there a contradiction in this?
 - A) Differences would have to be caused and an uncaused reality could not have any “caused realities” within it. It must be pure existence. It could not be both caused and uncaused. (W+ 60)

8. Okay, now this is really going to get harder – try to describe in your own words why “pure existence through itself” cannot have any restrictions. Hint – if you need to, go back to the formula at the end of Step Three of the proof, and fill in the blanks again.
 - A) “Pure existence through itself” does not need any restrictions because it exists through itself (it is uncaused). Therefore, any restriction must be different from “pure existence through itself”. Since we already proved there can be no differences in “pure existence through itself”, there can be no “restriction to existence” in “pure existence through itself”. Therefore – “pure existence through itself” must be unrestricted. (W+ 62)

9. If you are really a glutton for punishment, try this one – Why must an unrestricted reality be unique – one and only one?
 - A) If there were more than one uncaused reality, there would have to be differences between them. Differences are restrictions and uncaused realities can have no restrictions so there can be only one uncaused cause. (W+ 63)

10. Here is the last one – Why must an unrestricted reality be absolutely simple (devoid of complexity)?
 - A) A watch is complex, it has many parts – they break or wear out often. A sundial has only one part and lasts for centuries (though it does have certain obvious drawbacks). Complexity requires more parts and more parts require more restrictions. Since “pure existence through itself” can have no restrictions, it must be free from all parts and complexity, completely simple – better than a sundial. (W+ 64)

Dawkins doesn’t give a definition of either “God,” or “Designer” beyond a common sense meaning. If he had bothered to do this, and had given only a minimal definition of God (such as the “metaphysical God” of Aristotle — an “uncaused reality”) he would have discovered that an uncaused reality is absolutely necessary. If he had looked into the attributes of an uncaused reality, he would have seen that such a reality cannot have any differences or restrictions within itself, and if he discovered that, he might have made the further discovery that this reality must be absolutely one and absolutely simple allowing him to avoid the major blunder of asserting the complexity of God. (WB 65)

Episode Three

Chapter 4

A Summary of the Evidence for an Intelligent Creator from Physics

1. What is the definition of an “informal inference”?
 - A) John Henry Newman would call this convergence of three data sets an “informal inference”. He defined that as a convergence of multiple data sets (each of which is independently probable) on a single conclusion. (W+ 70)

2. How would that apply to what we have just discussed in this chapter?
 - A) ...we have three scientific data sets (the B-V-G Proof, entropy, and fine-tuning), and one logical-metaphysical proof all converging on a single conclusion – namely, that a transcendent intelligent Creator exists – and created the whole of physical reality. Notice what Newman said about this convergence – all four of these independently probable data sets mutually corroborate (reinforce) and complement one another. This means that if one or more of the data sets undergoes modification, the conclusion can still stand. Like individual strands of nylon woven into a rope, the strength of the whole is far greater than the individual components. (W+ 70)

3. Do you think the four kinds of evidence are sufficient for reasonable and responsible belief in an intelligent Creator? If so, why, and if not, why not?
 - A) Chapter Review: Three sets of data from physics all point towards a Creator. So also does the metaphysical proof of God, which allows us to make the informal inference of a transcendent, intelligent Creator. Recent history has shown that the above evidence is so strong that physicists have to conjure up incredibly unlikely and convoluted scenarios just to avoid it. The physical evidence on its own favors a Creator, ... (W+ 70)

4. Ockham’s Razor holds that the more complex natural explanations become, and the more assumptions they require, the more they violate the elegance of nature. Do you agree or disagree, and why?
 - A) It is difficult to dispute the wisdom behind the test of Ockham’s Razor. It is one of the first tests scientists look to for seeing if they are on the right track. It appears Dawkins had the right idea; he was simply going down the wrong set of tracks with his assumptions.

“At this point, Dawkins’ objection becomes relevant– if a designer must be more complex than what it designs, then it must be more probable. But this objection proves to be invalid, because an uncaused reality (necessary for existence) must be absolutely simple – as we have shown in the metaphysical proof of God. By Dawkins’ own logic then, this supernatural Creator and Designer is the most probable cause of the anthropic conditions and constants of our universe.”
(W+ 69)

Episode Three

Chapter 5

Evidence of a Soul from Near Death Experiences

1. What is the definition of “clinical death”?
 - A) “The absence of electrical activity in the cerebral cortex (flat EEG) and in the lower brain (shown by fixed and dilated pupils and the absence of gag reflex).” (W+ 72)

2. How does that definition play a role in Near Death Experiences?
 - A) With no electrical activity in the brain, we should not be able to see, hear or comprehend sensory stimuli, and we should not be conscious or capable of thinking. (W+ 72)

3. What do you think about NDEs as evidence of a soul and life after death?
 - A) Considering all of the studies that have been done and the quality of the doctors involved, the evidence is quite astounding. Further, using only those who were found to be clinically dead enhances the case to be made for these being transcendental experiences.

4. How would you explain people blind from birth suddenly being able to see while they were clinically dead?
 - A) My first thought, a miracle. In fact, lots of them according to the “Ring Study” and the Von Lommel Study. To be able to see without their useless eyes AND while clinically dead seems to me to portend things to come after death. (W+ 74)

5. How would you explain a clinically dead child meeting a relative they never knew existed, and learning facts that were later verified by parents or others?
 - A) How would anyone explain it other than as an out of body, transcendent, experience. Even more importantly, they have been able to go to another place entirely, where those who have gone before us, seem to be living quite happily. These studies give me great hope. (W+ 74)

6. Which, if any, of the four kinds of veridical evidence did you find most compelling? If you answer “None”, why?
 - A) I find the blind who see after death the most compelling. They cannot make up seeing what they have never seen. Still, the people meeting relatives they never met before or meeting Jesus are also quite difficult to explain as well. (W+ 75)

“Medical science has entered into the domain of a transphysical soul and a heavenly domain through modern resuscitation techniques. People in the midst of an NDE pass through walls, see where their missing dentures were placed and hear what their friends were saying about them in the waiting room, the blind see--many for the first time ever--and children meet Jesus or long deceased relatives they never knew existed.”(W+ 75)

Episode Four

Chapter 1

Near Death Experiences (NDEs) Continued

1. What is the criterion for an “accurate” case study?
 - A) If a case study had one detail found to be inaccurate, it was classified as “inaccurate”. Holden determined only 8% of the cases reviewed had any inaccuracies. She found 37% of the cases to be perfectly accurate, and 55% to be “not inaccurate, but not perfectly verifiable by independent researchers.” (W+ 78)

2. What is unusual about the experience of most blind people who have an NDE?
 - A) 80% of blind people see during clinical death. (Note – 100% lose the ability to see once again upon recovery) (W+ 78)

3. What commonly happened to children who had a NDE?
 - A) how common it is for NDEs to include visits to relatives long since deceased. This is especially true in the case of young children where an “agenda” would be unlikely. Children often described these relatives in their younger years as their parents might have known them. Many had passed away before the children were born. This is circumstantial evidence but is so common, it is too important for researchers to ignore. This evidence was put forth in the van Lommel, Ring, Morse, Moody and Gallup studies. (W+ 80)

4. What is a lasting effect of nearly all children who experienced a NDE?
 - A) ...the children, from two significant NDE studies, who had almost no death anxiety after recovery? Recall that other children who suffered clinical death and recovered without experiencing an NDE had measurably higher death anxiety than the norm. These higher and lower levels of death anxiety continued into adulthood. (W+ 80)

5. Do you think the empirical evidence shown in these multiple studies indicates the likelihood of an afterlife, soul, and God?
 - A) The best and most reasonable conclusion to the NDE case studies would seem to be the affirmation of a transphysical soul. That is, something that survives bodily death. (W+ 82)

6. Do you know anyone who has experienced a NDE. If so, did their experience follow any of the above experiences?
 - A) I do. Fr. James P. O’Bryan, S.T., had an aneurism and went through many of the described experiences. These included floating above the operating table, going to a white light, seeing and recognizing people praying for his recovery and an incredible sense of peace (during and after). (close personal friend – MKN)

Episode Four

Chapter 2

More Evidence of a Soul from the Five Transcendental Desires

1. What does “transcendental” mean?

- A) *Transcendental* relates to a spiritual or non-physical realm: The transcendental importance of each person’s soul (for example). It often refers to things that transcend our ability to completely comprehend. (W+ 84)

2. What are the five transcendental desires that philosophers since Plato have recognized as the key objectives of human life and endeavor?

- A) i. Perfect and unconditional Truth
ii. Perfect and unconditional Love
iii. Perfect and unconditional Justice (Goodness)
iv. Perfect and unconditional Beauty
v. Perfect and unconditional Being (Home) (W+ 84, 85)

3. How do we know that we have desires for perfect truth, love, justice (goodness), and beauty and being? (Hint: it has to do with imperfection and the first two steps of the above transcendental arguments.)

- A) One of the most basic experiences we have is the experience of imperfections in the world around us. We seem to be instinctively aware of imperfections in our understanding of things (truth), imperfections in the love of others and even ourselves, imperfections in the justice or goodness of others and ourselves, imperfections in the beauty of the world around us, and imperfections in our sense of “being at home in the world.” Indeed, we seem to recognize every imperfection in these five areas – instinctively and endlessly. How could we recognize these imperfections unless we had an awareness of what perfection in these five areas would be like? (W+ 85)

4. What is not the source of our awareness of perfect truth, love, justice (goodness), beauty and being? (Hint: look at Step 3 in the above transcendental arguments.)

- A) ...it cannot be anything in this world – because all of the objects of our experience and all the ideas that we have are imperfect – inciting us to ask further questions. So we clearly did not get our tacit awareness of everything about everything from either our experience of the outside world or the ideas we already grasp. (W+ 86)

5. What must be the source of our awareness of perfect truth, love, justice (goodness), beauty and being? (Hint: look at Steps 3&4 of the above transcendental arguments.)

- A) If the above reasoning is correct, then God is not only the unique

unrestricted uncaused reality who is the cause of everything else; he is also perfect intelligence, perfect love, perfect justice (goodness), and perfect beauty. Furthermore, he is present to our consciousness as the source of our awareness of perfect truth, love, justice (goodness), and perfect beauty. As such, he incites us to creativity in every form of human endeavor – in the striving for greater truth, love, justice (goodness), and beauty. God not only gives us a transcendent soul (manifest in the evidence of near death experience), He also fills our soul with the horizon of his perfection, which causes us to be everything that we are – an image of himself. (W+ 90)

6. If the above transcendental arguments are correct, then what must God be in Himself?

A) As it turns out, all of these perfections must be absolutely simple – and as we implied in our metaphysical proof of God, there can be only one absolute simplicity. Hence, only one reality – the one absolutely simple reality – can be perfect truth, perfect love, perfect justice (goodness), and perfect beauty. The unique unrestricted absolutely simple uncaused reality must also be perfect truth, love, justice (goodness) and beauty – God. (W+ 90)

7. If the above transcendental arguments are correct, how must God be present to our consciousness?

A) ...He is present to our consciousness as the source of our awareness of perfect truth, love, justice (goodness) and perfect beauty... (W+ 90)

“God causes us to be like himself – though imperfectly – but nevertheless – like himself.” (W+ 90)

Episode Four

Chapter 3

A Summary of the Evidence for a Creator and a Soul plus the Question of Atheism

1. What are the five separate areas we have used to provide evidence for the existence of God and/or a soul? Look at the intro or the summary.
 - A)
 1. Space-Time Geometry Proofs (particularly the B-V-G Proof) implying a beginning of physical reality.
 2. Entropy indicating a beginning of our universe.
 3. Anthropic Coincidences implying supernatural design of our universe.
 4. Near Death Experiences implying the existence of our transphysical.
 5. Five Transcendental Desires implying a transcendental soul. (W+ 93)

2. What are the five major motivations for atheism?
 - A)
 1. Atheism and Suffering. According to the case studies of Ignace Lepp (Atheism in our Time³⁹), one primary motive for atheism arises out of an inability to give a positive interpretation to suffering. (this is a choice not based on rational evidence)
 2. Atheism Rejects Moral Authority Beyond the Self. (personal choice)
 3. Atheism and the Allegation of “Wishful Thinking.” (Sigmund Freud declared himself to be an atheist because he felt that religion was essentially “wishful thinking” or an “illusion.”) (personal choice)
 4. Atheism and Historical Revisionism. (...these revisionist views of history ignore the fact that religion gave rise to social order and laws, that the prophets continuously spoke out against social injustice and championed the cause of widows, orphans, and the poor, that Christian teaching within the Roman Empire eventually led to the overcoming of the injustices of slavery, and that Christianity gave rise to the first public education systems, social welfare systems, and healthcare systems) (personal choice based on faulty reasoning)
 5. Other Personal Motives for Atheism. There are many personal motives for the rejection of God/religion. Frequently these motives are not so much a rejection of God, but a rejection of religion. (personal choice) (W+ 95 – 97)

3. How would you respond, from your experience, to someone who rejects God because of suffering?
 - A) In Christianity, suffering has a positive interpretation, and even a set of prayers and methods to turn suffering into a means of love (and growth in love). Christians should help this group to bring positive meaning into their suffering. (W+ 95)

4. How would you respond to a person who rejects God out of a refusal to acknowledge a higher moral authority?
 - A) We see this kind of Nietzschean atheism in people who do not want to be responsible to a moral authority above or beyond themselves (e.g., God).

Again, note that this is a choice based on a desire – not a decision made on the basis of evidence. Furthermore, this choice requires that we decide for ourselves what is right or wrong...(note – should we be our own moral compass?) (W+ 96)

5. How would you respond to a person who rejects God in order to avoid the accusation of “wishful thinking”?
 - A) Carl Jung, disagreed with him (Freud) and declared that religion was not wishful thinking, but induced by a sense of God’s presence within us. This is confirmed by Rudolf Otto’s analysis of the numinous experience in comparative cultures throughout history (W+ 96)

6. How would you respond to a person who rejects God because of a negative interpretation of the role of religion in history?
 - A) ...these revisionist views of history ignore the fact that religion gave rise to social order and laws, that the prophets continuously spoke out against social injustice and championed the cause of widows, orphans, and the poor, that Christian teaching within the Roman Empire eventually led to the overcoming of the injustices of slavery, and that Christianity gave rise to the first public education systems, social welfare systems, and healthcare systems. Even today, the largest international educational, social welfare, and healthcare systems are based in religion. (W+ 97)

7. How would you respond to a person who rejects God as a reaction to a negative portrayal of God learned during childhood?
 - A) ...it is incumbent upon Christians to convey the correct teaching about God from Jesus. (W+ 98)

8. Explain “persistent naturalism.”
 - A) “persistent naturalism,” is a fear of proposing a supernatural explanation until every possible and natural explanation has been ruled out. As noted earlier, every possible natural explanation can never be ruled out (W+ 98)

9. What is the viewpoint of Sir Arthur Eddington toward the spiritual?
 - A) We all know that there are regions of the human spirit untrammelled by the world of physics. In the mystic sense of the creation around us, in the expression of art, in a yearning towards God, the soul grows upward and finds the fulfillment of something implanted in its nature. The sanction for this development is within us, a striving born with our consciousness or an Inner Light proceeding from a greater power than ours. Science can scarcely question this sanction, for the pursuit of science springs from a striving which the mind is impelled to follow, a questioning that will not be suppressed. Whether in the intellectual pursuits of science or in the mystical pursuits of the spirit, the light beckons ahead and the purpose surging in our nature responds. (W+ 98 - 99)

Again, it is incumbent upon Christians to convey the correct teaching about God from Jesus.

Episode Four

Chapter 4

The Bible, Evolution and Aliens

1. What are your thoughts about the compatibility between the Bible and science?
 - A) Today we can understand the salvific truths in the Genesis narrative as easily as the biblical author's audience in 500 BC. If we do not confuse the salvific intention and content of God's revelation with the method and content of the natural sciences, there will be no contradiction between the biblical and scientific accounts of creation. (W+ 103) NOTE – As Fr. Spitzer says often, “The scriptures do not teach science and science does not teach theology.”

2. What is the purpose of the Bible?
 - A) The Bible – reveals sacred truths necessary for salvation. (W+ 102)

3. How and why did God inspire the biblical writers?
 - A) The “partnership” theory of divine inspiration holds that the biblical author plays a role in the production of the revealed text. He brings his thinking patterns, his culture, his sense of history, and his categories to the writing process. Why would God allow this? Because he wants to communicate with the people in the biblical author's audience. (W+ 103)

4. How is the God of the Bible different from the pagan gods?
 - A) Our God is one God, Creator of all things. Pagan gods were “nature gods” (sun god, moon god etc.). Our God created the sun, the moon etc. He is the God of all. Pagan gods, according to their myths, were capricious by nature and treated humans as playthings and even “cannon fodder”. Our God is love and truth. We were created by him in his image. Our salvation comes through the loving sacrifice of his only son, Jesus Christ. Pagan gods take lives, our God saves lives. (W+ 105)

5. Does the theory of evolution conflict with the Bible?
 - A) Well, what about the implication that the world was created in six days? First, we should not consider the duration of creation to be a truth of salvation. Secondly, we cannot take the term “day” literally, because it is used not to indicate a quantity of solar time (there was no sun on the first day...), but rather to indicate distinct stages within God's creative process. What about the implication that the world is only 5,000 years old (if you add up all the generations in the Bible)? Again this is not a truth necessary for salvation, and the generations of Israel are certainly not meant to be an indication of the age of the universe. So these images do not contradict the scientific account that God created the universe 13.8 billion years ago... (W+ 105)

6. Explain the limits of Catholics' acceptance of evolution.

- A) The Bible is making the theological point in Genesis that human beings were created as distinct from the animals and “made in the image and likeness of God.” Can these two theological truths be consistent with the truth of evolution? Yes – so long as we hold that human beings are not only biological organisms (subject to an evolutionary process), but have a unique transphysical soul individually created by God (not subject to an evolutionary process).
(QR38, W+107, QR 34)

7. Is alien life possible in our universe?

- A) Yes (see W+109 for complete explanation)

8. Explain the difficulties in holding that creative, intelligent, transcendental alien life developed solely through a physical biological evolutionary process.

- A) As you can imagine, it is far, far, far less likely than discovering rocky planets, bacteria, plants, and earthworms – far, far, far less likely than discovering mammals with developed brains. The development of the human cerebral cortex is so complex and refined that the odds of it occurring by pure chance in the relatively young age of our universe (13.8 billion years old), is highly, highly unlikely. Even non-religious philosophers of mind, such as Thomas Nagel, do not believe that this could occur through a strict neo-Darwinian evolutionary process alone because there is simply not enough time for it to occur. (W+ 110)

9. If aliens do exist, do we have an obligation to teach them about God and salvation?

- A) If we discover an alien being like ourselves on another planet (or if they discovered us on this planet), we should catechize them and baptize them, because they were created by God for the same fulfillment we were – a fulfillment that can and does come from the Father of Jesus Christ. (W+ 110)

Catholics may believe in evolution (as scientifically verified) so long as they do not deny the existence of a transphysical soul (Pope Pius XII – Encyclical letter Humani Generis – 1950)

Episode Four

Chapter 5

Series Review

We have reached the end of this journey. The following questions are all meant to be reflective and, as such, we offer no input. Please feel free to share your thoughts with us at our forum (see inside front cover) or at “Contact” at magiscenter.com.

1. What is the single most important thing you have learned from this series?
2. How have your thoughts and beliefs changed as a result of studying this series?
3. Have you thought about how you might use this new information?
- 4) Do you have any remaining questions about God, human souls, evolution, etc? If so, contact us at the Magis forum (see inside front cover) or “Contact” at magiscenter.com.