Scientific, Philosophical, and Theological Issues in Christianity

By

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Preface

As the title reveals, this book investigates many of the important scientific, philosophical, and theological issues in Christianity. I have long been fascinated by the number of physicists, including eminent Nobel laureates such as Einstein and Townes, who believed in God. Physicist Nima Arkani-Hamed once declared in a talk that "The universe is inevitable," and at the same time, "The universe is impossible." According to the standard model of particle physics, if its laws had been strictly obeyed after the moment of creation in the Big Bang some 13.8 billion years ago, there should have been a complete annihilation of matter, but here we are. Even to get the show on the road with the Big Bang required the lowest possible degree of entropy, Sir Roger Penrose calculated that the "Creator's aim" had to be accurate to one part in 10^(10^123), an unimaginable number that vastly exceeds the probability boundary. The fact that the universe is comprehensible and mathematically elegant is proof positive that God wants us to understand His creation, and He gifted us with the intelligence so that we can do so.

The first chapter examines ways of knowing in science and philosophy—deduction, induction, and abduction. One or all of these methods are used at various times when addressing theological issues. Of course, the inductive method relies of experiment and observation, which is a method we cannot use in theology. However, we can evidence science has revealed to reason abductively to theological conclusions. Abductive reasoning begins with all the available observations relevant to a particular phenomenon and infers the most reasonable explanation for their totality, while leaving space for other possible explanations. This is the method the criminal courts use to infer (not deduce) that the accused is guilty "beyond a

reasonable doubt." Natural theology uses this approach to reasoning about God from propositions which theists, agnostics, and atheists will all recognize as self-evidently true, albeit not all interpreting them identically.

The second chapter looks at various cosmological arguments for God from Plato and Aristotle onwards, with the overall theme being the age-old question: "Why is there something rather than nothing?" Martin Heidegger said this is the fundamental question of metaphysics, so if this is so, the answer must be the most fundamental existential answer. Some physicists have joined Shakespeare in making "Much Ado about Nothing." Hawking and Mlodinow have applied the mathematics of M-theory and the laws of gravity, which they say was designed by M-theory, to make a universe out of "nothing." Lawrence Krauss's "nothing" is also not nothing, as he states, "'nothing' is every bit as physical as 'something,' especially if it is to be defined as the 'absence of something.'" These theories were designed to airbrush God out of the picture, but have been heavily criticized by many other physicists.

Chapter 3 first explores the Big Bang and the fine-tuning of the four fundamental forces. It then takes a look at our privileged place of our solar system in the Galactic Habitable Zone of the Milky Way. We are far enough away from the dangerous center, but close enough to benefit from the heavy elements that supernova explosions spew out into space. Our planet is in the Circumstellar Habitable Zone of the solar system, the band of space around the Sun that is hospitable to life. So many features of the Sun, moon, Mars, Jupiter, and Earth itself are so conducive to life that the impression of design is overwhelming. If not design, we are confronted with what physicist Fred Hoyle called a "monstrous sequence of accidents."

Chapter 4 focuses of fine-tuning in biology; specifically, the genome and its products and the brain. The human genome has been called the "Language of God." It is a semiotic code consisting of over three billion letters that build the protein's that build us. Proteins are extremely complex micro molecules which require folding in their precise 3D shape. There is a near infinitude of possible ways to fold. Supercomputers take about one year to fold one, but it takes the genome just tens of microseconds. All this takes place in a super nano-factory called a cell. We then examine why sexual reproduction evolved from the asexual, which entails the evolution of meiosis from mitosis. Genes build brains, but as amazingly complex as genes are, the building is more complex than the builder. The brain has billions of communicating neurons that make trillions of connections with each other. We look at how these connections are made via synaptogenesis by which is driven largely by developmental experiences.

Chapter 5 looks at what is perhaps science's greatest unsolved mystery: how life arose from lifeless chemistry. There was much optimism after the famous 1952 Miller-Urey experiment, but this has slowing given way to pessimism; even Urey now says that he cannot imagine how it happened. There have been over 150 theories of abiogenesis that checkmate one another. The boundaries to be overcome, such as amino acid chirality and their reaction rates, are a legion. Some have given up on the idea that life began on Earth and have invoked the multiverse (if there is a near infinitude of other universes, one has to win the ultimate Powerball game, and that is us) or panspermia (life came from outer-space). We examine the leading hypotheses for life's origin: RNA-first and metabolism-first, followed by the emerging top-down belief that information holds the key to the origin or life. Information only comes from a mind.

The fact and theory of evolution is the subject of Chapter 6, beginning with Darwin's theory of natural selection and continuing with how culture drives evolution via genetic drift and gene flow. The difference between micro- and macroevolution is explored with the assertion that the later issues from the former. This is followed by discussions of teleology, gradualism, and punctuated equilibrium. It has been said that Charles Darwin made it intellectually respectable to be an atheist, but Darwin was not one. He often wrote about purpose and a first cause behind evolution. We then look at the useless battle between evolution and "scientific" creationism. The latter does a lot of harm to theism and has been abandoned by mainstream Christianity. We then look at theistic evolution and intelligent design. Theistic evolution has been considered since the time of St. Augustine and is accepted by all mainstream denominations.

Chapters 7 through 9 shift from the natural sciences to philosophy and the social sciences. Chapter 7 explores what morality is relying mostly on Kant's categorical imperative. It contrasts moral absolutism with moral relativism from Christian and atheistic perspectives, and then discusses whether an evolved sense of morality can suffice for a categorical imperative. I follow this with a discussion of Old Testament morality through the lens of Plato's Euthyphro dilemma, and finally, a discussion of rationality, noting that only a very small percentage of natural science Nobel Prize winners over the last century described themselves as atheists or agnostics.

Chapter 8 looks at the new atheist movement and its agenda. Its ideological precursor is cultural Marxism, which had as its agenda the destruction of the epicenters of middle-class morality—religion and the family by stealthily capturing the social institutions. We then explore atheist morality as applied in political practice during the 20th

century by the Union of Soviet Socialist Republics, the People's Republic of China, and Nazi Germany.

Chapter 9 looks at the social and personal value of Christianity, beginning with its value to free societies. The new atheists claim that Christians are more likely than atheists to behave antisocially, a claim massively refuted in the criminological literature. In economics too, the literature is unequivocal that Christianity is a driver of societies' economic success, even without considering charitable giving. A life with God in it provides happiness and meaning in our lives, happy intact families, and better physical and mental health.

Chapters 10 through 16 focus on important theological issues. Chapter 10 focuses primarily on the Bible, beginning with whether it should literally or metaphorically and whether it is inerrant. The large number of Christian denominations is proof enough that an interpretation held as truth for one in held as errant by another. Archaeology reveals that the Bible in reliability in its historicity, and the number of documents and time gap between the events and their recording in the Bible is unmatched by any other ancient work. I then take a brief look at faith and reason, followed by a short discussion of individual differences in the likelihood of possessing religious faith according to the science of behavioral genetics.

Chapter 11 engages the issue of free will in Christianity. The free will-determinism debate has a long history in philosophy, and is often argued in terms of extremes—libertarian free will versus hard determinism. Within Christianity we have the hard determinism of Calvinism and the libertarianism of Arminianism, with the issue being who decides our salvation—God alone in the former and we alone in the latter. Most of modern Christendom is Arminian, and it bases its theodicies of the problem of evil on human free will. The problem with the Christian view of free will is that it leads to the belief

that people who do not accept Christ make that decision freely, willingly, knowingly, and deliberately. This leads it adherents to misunderstand how people come to have the mindsets they have and the decisions they make. The chapter ends by looking at the various filters of persuasion that shape people's belief systems.

Chapter 12 deals with perhaps the most contentious issue in Christian theology: the problem of hell. Traditionalist hold steadfastly to it, while others claim that it deals a death blow to the love, justice, and mercy of God. Many Christians are surprised to hear that only one of the six early Churches subscribed to the doctrine of everlasting conscious torture. These were the men taught by the Apostles, or by those whom the Apostles taught, so their doctrines should carry great weight. There are nuanced arguments for or against hell that we address, but there has been a great exodus from the doctrine among theologians and philosophers of late, a number of who assert that it wended its way into Christianity via Platonic philosophy. Constantine was decidedly in favor of hell to consolidate and control his empire, and it became canonical after the first Council of Nicaea in 325. Traditionalists defend hell by saying that it is in Scripture, but Greek and Hebrew scholars contend that words such as *sheol, hades,* and *Gehenna* have been wrongly translated into a composite hell, and many modern Bibles do not contain the word. Christianity is rooted in love and forgiveness, not hellfire and brimstone, terror, and sadism.

The case for purgatory is offered in Chapter 13. Because of the moral problem of hell, we are witnessing a resurgence of interest in the doctrine of purgatory among both Catholic and Protestant theologians and philosophers. I explore the differences in Catholic (the satisfaction model) and Protestant (the sanctification model) views of purgatory, and the Jewish and Muslim views. The earliest fathers of the Church supported the doctrine of purgatory as their

view of "hell." I then turn to the practice of praying for the dead in Christianity, Judaism, and Islam. Although many Protestant denominations condemn the practice as unbiblical, it was prescribed by the early Church. God's love does not cease at the moment of death any more than does our love for relatives and friends who have died, so our prayers for our beloved departed cannot be unmentionable to Hin. Both purgatory and praying for the dead is logically deduced from the view of God as the epitome of love, justice, and mercy.

Chapter 14 addresses and issue that is gaining widespread traction in modern Christianity; that of universal salvation. This was a common belief among the early Church Fathers, so the appeal made here is a return to the doctrines of those who knew Christ best. However, it was condemned as heresy by the Council of Constantinople in 543 AD at the instigation of emperor Justinian for much the same reason that Constantine insisted on hell two centuries earlier. There are hundreds of biblical verses that can be read as clearly, or implying, universal salvation, including God's will that all shall be saved. Opponents of the doctrine aver that our sinful wills condemn us, thus implying that our will to sin is stronger than God's will to save us. I look at the doctrines that share the disgust of hell—annihilationism and separationism—as alternatives universal salvation, and conclude that if we take the Bible as a whole, there is no more logical eschatological deduction that aligns with God's love, mercy, and justice than universal salvation.

Two thousand years ago, an event occurred that reframed all subsequent: the death and Resurrection of Jesus Christ. This is the topic of Chapter 15. Historical events are non-repeatable and thus historians cannot "prove" their explanations scientifically. However, historical explanations are like scientific explanations in that the best explanation for a set of facts is regarded as the one that gathers more

facts under its umbrella (its scope) and can explain the event without excess suppositions (its power). The supernatural explanation for the Resurrection has been shown over and over to have greater explanatory scope and power than alternative naturalistic explanations. Many great lawyers have subjected the Resurrection account to the strict evidentiary rules of common law and found that it must be regarded as proved beyond a reasonable doubt. I also address the claim that miracles are impossible, followed by the various secular hypotheses of the Resurrection. I conclude with a discussion of the radical transformation of the Apostles. Their transformation from cowards demoralized by the crucifixion into fearless carriers of the Christian message within days, and their subsequent martyrdom, is powerful proof that everyone can relate to.

The final chapter concerns the Shroud of Turin, which many call the "silent witness of the Resurrection," is the most studied artifact in history. We first look at the uncertain provenance of the Shroud via historical records and its relationship to the Sudarium of Oviedo and the Hungarian Pray Codex. The Shroud of Turin Research Project (STURP), consisting of scientists from many disciplines, have investigated it using many tools and determined that it could not have been made by human hands. Then came the radiocarbon dating of the Shroud that declared it to be a 13th century creation. However, it was later found that the small snippet taken from the Shroud was contaminated, and many other later dating methods place it well within the period of the crucifixion. There are many mysteries about the image of the Shroud which seem to be inexplicable. There are many other mysteries, such as the blood on the Shroud, and pollen and limestone found only in an around Jerusalem.

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Chapter 1
Natural Theology, Philosophy, and Science

Seeking Knowledge of God

Theologian John Wright informs us that "Aristotle (384-322 B.C.) begins his metaphysics with the unforgettable sentence: 'All human beings by nature desire to know'" (1991, p. 653). Physicists Stephen Hawking and Leonard Mlodinow, in their book *The Grand Design* (2010), also insist that humans are curious creatures who desire answers to a multitude of fundamental questions about the universe and human existence. Many people fit this description, while many others do not. The latter are those who drift through life, accepting what they are told and rarely question anything except the mundane things that directly affect their lives. Others are passionately curious, which requires openness to new information and ideas. For these, the reward is not found only in the destination but also in the journey. Surely the most fundamental questions of all are the existence of God and humanity's place in the scheme of things. For some religious believers, their beliefs and experiences of God is enough, and do not require evidential justification beyond that. Others have come to believe that God is knowable and intelligible to the human mind through means beyond the Bible. Thus, there are three broad avenues to travel when seeking God: science, philosophy, and theology. While these avenues are distinct, many scientists, philosophers, and theologians seek maps where they converge on profound truths.

Astrophysicist Paul Davies sees such a convergence. He opines: "It may seem bizarre, but in my opinion, science offers a surer path to God than religion. Right or wrong, the fact that science has actually

advanced to the point where what were formerly religious questions can be seriously tackled, itself indicates the far-reaching consequences of the new physics" (1984, p. ix). Davies is not saying that science can *replace* the Bible as the way to find God, only that it may be a *surer* way for those who are seeking but have not yet found Him, given that what science reveals can be universally verified. Dan Wakefield wrote similarly to Davies: "Only a generation ago, we enlightened intellectuals believed science has not only disproved but replaced God; now science is one of the major factors making the idea of God a serious subject again. . .. It is the scientists who seem to be taking the lead from the theologians" (1989, pp. 28-29). Likewise, Nobel laureate physicist Ernest Walton notes that studying and contemplating the wonders of creation leads one to contemplate God: "One way to learn the mind of the Creator is to study His creation. We must pay God the compliment of studying His work of art, and this should apply to all realms of human thought. A refusal to use our intelligence honestly is an act of contempt for Him who gave us that intelligence" (McBrierty, 2003, p. 58). None of this means that we can establish a personal relationship with God through science; only that science is most useful in discovering God's fingerprints on His creation.

From its inception, Christianity has been infused with philosophy and has been intimately linked to science from the earliest times of science. In his book *Miracles*, C. S. Lewis remarks: "Men became scientific because they expected Law in Nature, and they expected Law in Nature because they believed in a Legislator" (1947, p. 110). Many men of God were eminent scientists. Friar Roger Bacon is considered the father of the scientific method; Jesuit priest Roger Boscovich, a mathematician, produced the precursor of atomic theory; Gregor Mendel, a monk, founded the science of genetics; priest Nicolas Steno is considered the father of geology, Jean-Baptiste Carnoy, the father of cell biology, was a priest, and physicist/priest Georges Lamaitre gave

us Big Bang theory. The fact that the universe is comprehensible and mathematically elegant is proof positive that God wants us to understand His creation, and He gifted us with the intelligence to do so. Nobel Prize-winning biochemist Melvin Calvin provides his understanding of the origin of science's necessary conviction that the universe is orderly and knowable:

> As I try to discern the origin of that conviction, I seem to find it in a basic notion discovered 2,000 or 3,000 years ago, and enunciated first in the Western world by the ancient Hebrews: namely that the universe is governed by a single God and is not the product of the whims of many gods, each governing his own province according to his own laws. This monotheistic view seems to be the historical foundation for modern science (Lennox, 2009, p. 46).

Science and philosophy seek knowledge in their own manner. Scientists want objective answers to questions about the natural world, for which there is universal or near-universal agreement. They obtain their answers through mathematics, observation, and experimentation. However, not all questions, particularly those that are most meaningful to people's lives, are open to objective answers. These are questions such as What is reality, love, justice, or mind? Philosophy shoulders the burden of attempting to answer such questions and ventures beyond science (while not contradicting it) to seek answers that people yearn for. Philosophy is thus more general and encompassing than science. Many great physicists, including Nobel Prize winners, are steeped in philosophy, affirm its value in their science, and insist that there is a cross-fertilization between science, philosophy, and theology. Geneticist, physician, and former atheist, Francis Collins, and former head of the Human Genome Project, found God in science. In a CNN News piece, he stated: "I have found there is a wonderful harmony in the complementary truths of science and faith. The God of the Bible is also the God of the genome.

God can be found in the cathedral or in the laboratory. By investigating God's majestic and awesome creation, science can actually be a means of worship" (2007, np).

Philosophy is the mother of all the formal systems of knowledge that have been parceled out into manageable chunks to the various departments in our universities. The "Ph." in Ph.D. stands for "philosophy," so philosophy is the foundation of all areas of academic inquiry. Because the subject matter of philosophy claims is all intellectual knowledge, it permeates all disciplines. It fusses around at their periphery to ensure that their propositions, theories, and truth claims cohere with formal rationality. Philosophy clarifies our thoughts, provides unsuspected possibilities, informs us of why we think about things the way we do, and perhaps solves some contradictions in our thinking that we never knew existed. It helps us analyze concepts, definitions, and arguments, organize ideas, and extract the essentials from excessive quantities of information. It also helps us to distinguish subtle differences between opposing views, find common ground between them, and perhaps even synthesize them. Philosophy often ventures beyond the physical world into the metaphysics. Metaphysics ("after or above the things of nature") is perhaps the most interesting and challenging branch of philosophy because it refers to realities outside human sense perception and thus cannot be accessed by the methods of science.

Philosophical and Scientific Ways of Knowing

Scientists and philosophers work with different goals, but share an intimate relationship. Both share the tools of logic, conceptual analysis, and rigorous argumentation. Questions for which we have (or can acquire) definite answers are in the realm of science; questions for which we have no definite answers are the bread and butter of philosophy. It is this uncertainty in which the value of philosophy

resides, because it engages a liberating doubt. Scientists are judged by the explanatory power of their findings and the clarity of their presentations applied to specific problems. Philosophers are judged by their persuasive use of logic and language by articulating the general intellectual framework within which specific problems reside. Albert Einstein believed that all scientists should cultivate a philosophical frame of mind or rest content to be outhouse counters unable to see the forest because they focus on only specific trees: "So many people today—and even professional scientists—seem to me like somebody who has seen thousands of trees but has never seen a forest. …the mark of distinction between a mere artisan or specialist and a real seeker after truth" (Dougherty, 2013, p. 6). The former practices normal science: the latter does revolutionary science. To do revolutionary science, in addition to mastery of a subject, one needs the philosophical wisdom and the imagination to delve deeper to uncover what we didn't even know we didn't know.

How do we know what we think we know? The short answer is that scientists perform experiments and calculations while philosophers rely only on the tools of the mind. Philosophy is like science without experiments, which lets it get into metaphysical areas where science can't go, such as "Why is there something rather than nothing"? No amount of experimenting and calculation will provide an answer to such a question. Yet, philosophy can provide an answer that is acceptable to reason when it considers multiple lines of scientific evidence. Scientists value questions for the answers they provide, and philosophers value questions for their intrinsic worth apart from any answers because they enrich the imagination. Another difference between philosophical and scientific knowledge is how philosophers and scientists arrive at answers to their questions, which engages the branch of philosophy called epistemology, the study of the validity and scope of knowledge, how it is acquired, and its nature.

Philosophy relies on abductive and deductive reasoning; science adds inductive reasoning to these.

Philosophy and Deduction

Deduction is the most reliable of the three. Its reliability revolves around the issue of the nature of the necessary relationship between its antecedent and its consequent, although such relationships are extremely rare outside of mathematics. It is a "top-down" method that reasons from a general premise (an axiom) that is purportedly self-evidently true ("All men are mortal.") and then derives further truths from it ("John is a man."), and on to a specific logical and irrefutable conclusion ("Therefore, John is mortal."). Many philosophers belong to a school of thought called rationalism, which contends that the world can only be understood as *it is* through the intellect because the senses allow us only to see it as *it appears.* They say that the phenomena of the world come to us through the buzzing confusion of sense perceptions and must be filtered, organized, and understood by the intellect. After all, our senses perceive that the sun moves from east to west across the heavens, and it is it, not Earth, that is moving. Nothing in our unaided senses or reason can tell us that we are on a wild cosmic ride as the Earth spins at about 1,000 miles an hour as we travel around the sun at about 67,000 miles an hour.

However, the intellect also deceives; it deceives even the greatest of minds. Nevertheless, rationalists idealize mathematics as the only true paradigm of truth because mathematical thinking rests on *a priori* knowledge that is true by definition. Mathematical truth is knowledge that existed before and is independent of experience. For example, the Pythagorean theorem states that the sum of the squares of the two sides of a right triangle is equal to the square of the hypotenuse: $a^2 + b^2 = c^2$. This is always true; it was true before Pythagoras discovered it, and it will be true even if the universe disappears tomorrow. This kind

of deductive "top-down" reasoning from truths considered self-evident has been viewed as the ideal path to knowledge ever since the time of Plato. It guarantees the truth of the conclusion given that it is already present in the premise ("All crimes are against the law.") and any denial of it is self-contradictory. Once we leave the certainty of mathematics and enter the real world, however, we run into trouble because, except in the most trivial and useless sense ("All mothers are females"), we have precious few major premises that are self-evidently true. Of course, some non-mathematical premises may be true, but seldom are they self-evident.

Mathematics is extraordinarily effective in describing physical reality. Galileo Galilei was not surprised because he noted: "Mathematics is the language in which God has written the Universe" (Ilić, Stefanović, & Sadiković, 2018, p. 124), and other great early scientists such as Copernicus, Kepler, and Leibniz, and Newton knew that the universe is capable of mathematical description because a rational God fashioned it rationally. Nobel laureate physicist Roger Penrose said: "There is something absolute and 'God given ' about mathematical truth" (2016, p. 146), and another Nobel laureate, physicist Paul Dirac, opined: "God is a mathematician of a very high order, and He used advanced mathematics in constructing the universe" (Varghese, 2013, p. xviii).

Mathematics has many practical applications. Newton developed calculus as a tool to understand movement and force, but mathematicians play around with shapes and equations unconcerned with any immediate practical use. The ancient Greek theory of conic sections had no practical application until Kepler found that it describes the orbits of celestial bodies. Perhaps the most famous example is Bernhard Riemann's work in non-Euclidean geometry in the 1850s. Riemann was not trying to explain something, and no

practical application was found for it at the time. However, his mathematical foundation for the four-dimensional geometry of space-time turned out to be exactly what Einstein needed to formulate his 1915 theory of general relativity more than 50 years later. More recently, the Higgs boson was uncannily predicted by mathematics almost 50 years before it was discovered in 2012. How uncanny is it that a group of physicists and mathematicians can sit down and calculate that a field (the Higgs Field) must exist to give mass to particles, and then have it verified by its force-carrying particle five decades later?

Science and Induction

Note that the mathematics of the Higgs Field had to be empirically verified before being accepted by the physics community. We cannot simply "rationalize" ourselves into knowing; knowledge must be gained by observation and experiment. Observation and experiment are "bottom-up" forms of reasoning, from the specific to the general, which is induction. A conclusion in a philosopher's deductive mode is a hypothesis in a scientist's inductive mode; an assertion to be tested experimentally. That is, while a valid deductive argument is one in which the premises infallibly confirm the conclusion, a valid inductive argument is one in which the conclusion tentatively confirms the premises, making them only more *probable* than not. There is always the possibility that future observations might contradict a previously established inductive conclusion. To conduct experiments and make observations, scientists are guided by theories from which hypotheses are logically deduced. Hypotheses are considered only probably true because the antecedent theories are only considered probably true.

Inductive reasoning is crucial for scientific progress, although it doesn't guarantee certainty. Scientific theories must be falsifiable; if a theory cannot be falsified, it cannot be tested and is therefore useless.

Unlike mathematical axioms, theories are not self-evidently true. Deductions from theory presuppose broad inductions from previous scientific work to validate their major premises. Knowledge of the world can only be achieved with some degree of confidence when we test our concepts in the world outside our own minds. That is, a deductive hypothesis is only solid when it is inductively justified. If the empirical hypothesis is not supported by the test, either the deduction or our measurements were faulty. Empirical science cannot produce the absolute certainty demanded by those who identify all true knowledge with mathematics, but the experimental-observational inductive method is the bedrock of all justified knowledge because it has been subjected to the stern judge of empiricism. Science recognizes, however, that knowledge that is justified at one stage of scientific progress may be overturned during another.

Abduction

The third method of reasoning is abduction. Abductive reasoning begins with all the available observations relevant to a particular phenomenon and offers the most reasonable explanation for them, while leaving space for other possible explanations. Peter Lipton (2000) provides a simple example of abductive reasoning in the form of Sherlock Holmes zeroing in on his arch enemy, Professor Moriarty, as the one guilty of a murder. Holmes infers that Moriarty is guilty because his inference best explains all the evidence gathered, such as fingerprints, blood stains, and other evidence. Despite Holmes' claim that he concludes deductively, he does not; rather, he made an inference to the best explanation. While all the evidence points to Moriarty's guilt, there always remains the possibility that someone else could be the guilty party. However, Holmes's inference about Moriarty's guilt provides the most reasonable explanation based on

the evidence before the court. Science and philosophy both employ abduction when pondering the profound questions of existence, as such questions lie beyond the scope of experimentation and observation.

Abduction is the primary form of reasoning we will use to explore the big questions because most of them are ontological. Ontology is the study of the fundamental nature of purpose, being, and existence. Abduction is a *post hoc* explanation of the totality of what we observe about a particular phenomenon. Because the process goes from consequence to antecedents rather than the opposite, as in deduction or induction, abductive reasoning is also called retroductive reasoning, which yields a result that is plausible without necessarily being fully justified. For example, if we observe that the street is wet, we may conclude that it has been raining. But there are other possibilities. It could also be wet if the street cleaners had just passed your house, or a water pipe had burst. All three possibilities (rain, street cleaners, a broken water pipe) have explanatory power; if any were true, it would explain why the street is wet. Intuitively, however, the explanation of rain is better than the others, especially if we seek further evidence, such as seeing that there is wet grass in the backyard, and fresh water in the rain gutters. We can thus reject the other possibilities and abductively conclude that the street is wet because it rained.

Abductive reasoning applies a wide range of scientific observations to a question. Once a wide range of scientific observations are made (call them A), anything (call it B) that neatly and satisfactorily explains A, renders B highly plausible. Within this abduction schema, valid data that explain A imply that A confirms B as the best explanation of all that A entails. Abductive explanations lead us to conclusions that are difficult to doubt, even though they lack the certainty that

accompanies the logic of deductive arguments from self-evidently true premises. Abduction is therefore a "cumulative case" argument that binds together as many arguments as possible for why X happened or why X exists in terms of balancing the probabilities such that X is more likely than not-X. We will use this method for the "God hypothesis" by weaving together facts from a wide variety of disciplines to conclude that the existence of God is the most reasonable ultimate explanation of everything.

The Anthropic Principle

Many scientists and philosophers have long worked under the assumptions of the Copernican Principle, a phrase coined by Hermann Bondi in 1952 and otherwise known as the "principle of mediocrity." This principle asserts that there is nothing special or privileged about us or our planet; we are just accidental creatures in an accidental universe. Copernicus, a devout Christian, would have been aghast to see his name associated with a view that aids atheists in their efforts to relegate God to history's dustbin. However, this view changed as science increasingly informed us that the universe is precisely calibrated for the emergence of intelligent life on Earth. Many physicists who gave serious thought to this began to believe that the "cosmological coincidences" that make our existence so astronomically improbable are not the result of blind chance but are part of the universe's very structure. With the razor-edge fine-tuning of the universe's many parameters, the Anthropic Principle emerged. Astrophysicist Brandon Carter coined the phrase in 1974, which may be seen as a counter to the Copernican Principle.

Fine-tuning means that the parameters or physical constants of the universe must be adjusted with mind-boggling precision for life to exist. There are several versions of the Anthropic Principle, starting with the Weak Anthropic Principle (WAP). The essence of WAP is

defined by Carter as, “we must be prepared to take account of the fact that our location in the universe is necessarily privileged to the extent of being compatible with our existence as observers” (1974, p. 293). Some have dismissed the argument by pointing out this compatibility is not at all surprising since if the universe were not so, we wouldn't be here to discuss it. This is an obvious but question-begging response because it does not inform us of *why* we are here to discuss it. John Leslie (1989) rebutted this response with his "firing squad" analogy. He asks us to imagine that a condemned man faces a firing squad of 100 expert marksmen. The order to fire is given, the shots ring out, but all miss, and the condemned man walks away. One marksman may miss, but surely it is impossible that all 100 did. It would not make sense to say that this is not at all surprising, since if they had not all missed, the condemned man would not be alive to ponder his luck. It is more sensible to conclude that something intentional was afoot; that is, the firing squad "designed" it such that the condemned man should go on living. We can apply the same reasoning to our lives—there is something intentional is afoot.

Why would such an apparent truism as WAP be useful to physicists in their work? Physicist Frank Tipler, one of the pioneers of the Anthropic Principle, observes: “But the Weak Anthropic Principle is not trivial, for it leads to unexpected relationships between observed quantities that appear to be unrelated!” (1988, p. 28). Stephen Hawking notes that the “Anthropic Principle is essential, if one is to pick out a solution to represent the universe,” and another great physicist, Andrei Linde, opining that: "Those who dislike anthropic principles are simply in denial…One may hate the Anthropic Principle or love it, but I bet that eventually everyone is going to use it" (Susskind, 2005, p. 353).

Carter added the Strong Anthropic Principle (SAP), which asserts that: "The universe (and thus the fundamental parameters on which it depends) must be such as to admit the creation of observers within it at some stage" (1974, p. 294). This statement implies purpose and deliberate design behind the universe and human existence. The material (matter/energy) and the laws governing their operation are not agentic, and purpose and design require an agency. Christians maintain that the reason the universe appears tailor-made for our existence is that God created it that way. Philosopher of science Michael Corey's Design-Centered Anthropic Principle (DCAP), stated as "The universe possesses life-supporting configuration because it was deliberately infused with these properties by a higher power" (2001, p.47), affirms this. There is no other reasonable explanation why the universe had to "admit the creation of observers" other than an endless trail of astronomically improbable coincidences.

Barrow and Tipler then proposed the Final Anthropic Principle (FAP), which says: "Intelligent information-processing must come into existence in the universe, and, once it comes into existence, it will never die out" (1986, p. 23). The FAP is reminiscent of a basic tenet of Christian faith as outlined in John 3:16: "For God so loved the world that He gave His only begotten Son, that whoever believes in Him shall not perish, but have eternal life." Theoretical physicist Heinz Pagels has written that the idea that a Supreme Being created the universe as a home for intelligent life is most unattractive to atheists, and notes: "Faced with questions that do not neatly fit into the framework of science, they are loath to resort to religious explanation; yet their curiosity will not let them leave matters unaddressed. Hence, the anthropic principle. It is the closest that some atheists can get to God" (1985, p. 38).

The Anthropic Principle is not an explanation of our existence in a strictly scientific sense. It is not a predictive theory but rather an abductive account of the fine-tuning we observe. It can't be predictive because it looks backward to explain what is already known, such as in the example given earlier for why the street is wet. The Anthropic Principle is a powerful argument for design and purpose in the universe and for the notion that humans are privileged. Physicist Josip Planinić views the SAP in this manner: "The anthropic principle, or the fine-tuned universe argument, can also be put forward as a design argument...It seems that the universe is arranged (tuned) exclusively to be agreeable to man. This thought on the notion of purposefulness implies the existence of a Creator of the universe" (2010, p. 47).

Einstein believed in a purposeful universe: "The religious inclination lies in the dim consciousness that dwells in humans that all nature, including the humans in it, is in no way an accidental game, but a work of lawfulness that there is a fundamental cause of all existence" (Isaacson, 2007, p. 46). Nobel laureate Max Planck, the father of quantum mechanics, has noted: "All matter originates and exists only by virtue of a force which brings the particle of an atom to vibration and holds this most minute solar system of the atom together. We must assume behind this force the existence of a conscious and intelligent Mind. This Mind is the matrix of all matter" (Olsen, 2013, p. 382).

We noted above that the anthropic principle is "the closest that some atheists can get to God." Several former atheists have been led to God by contemplating the many instances of anthropic fine-tuning of the universe for life. Indeed, one of the principal proponents of the anthropic principle, Frank Tipler, is one scientist who changed his worldview by contemplating these things. He wrote: