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Faith Integration Essay: Physics

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IV. Faith Integration Essay

Introduction. What follows is a discussion on the process and limitations of Theology, the process and limitations of Science, and how they relate to our pursuit of God's Truth. The particular "case study" that I choose to explore, for better or worse, is the way in which mystery, ambiguity, and paradox work in both Theology and Science.

Theological Mysteries. I think it is appropriate to say that orthodox Christian Theology is filled with ambiguity, mystery, and paradox. Some paradoxes just prompt us to think: "But many who are first will be last…" (Matthew 19:30) isn't literally about standing in line, but an expression of God's economy of self-denial and ultimate fulfillment.[1] These sorts of paradoxes are "truth standing on her head to get attention."[2] But some puzzles aren't as easily explained. Most fundamentally, we worship a triune God, the Three in One. While still remaining orthodox, our best theologians haven't been able to describe our God without the apparent logical incongruity of three Persons, each fully and equally God, united in one Being. This triune God then created time and space and everything in it. He exists outside of this creation, knowing all things past, present, and future, and continually sustains the stars, planets, all life and humanity through His grace. So what of free will? Then God the Spirit revealed to us that He is present, powerful, and filled with love. So what of evil? Later on, God the Son became flesh and dwelt among us as the God-man Jesus —human yet divine, omnipresent yet localized, all knowing yet limited in knowledge — the two natures united as a single Person. Early

[1] There are many more: lose you life to save it (Mark 8:35); the Beatitudes (Matthew 5); strength through weakness (2 Corinthians 12:10), to name a few.
[2] As quoted by G. K. Chesterton.

Christians who met Jesus wrote down what they experienced, but even those accounts "…contain some things that are hard to understand." (2 Peter 3:16) We are told that God the Son "gave up his divine privileges" (Philippians 2:7) to be born as a man and that he experienced hunger (Matthew 4:2). He was then killed. But after being raised again, He ascended back into Heaven (Mark 16:19). So Jesus is no longer a human, though he is, and always was, God. He breathes the Holy Spirit into us, an event just as significant as having been born in the first place. But the idea that God the Son would suddenly become one of us, getting his hands dirty while eating breakfast with a motley band of boatmen, healing the sick, blessing the poor, telling us to drink his blood, and being killed for who he was, only to say "NO! Death will not have the final word." … is mysterious and strange, troubled with paradox. So is it logical? Perhaps some of the early heretics — e.g. Nestorius, Arius, or the Gnostics — were merely rationalists at heart…

Interlude One. At this point I want to make it very clear that I am by no means saying that orthodox Christian faith cannot be rational! For example, the ancient manuscript evidence for the New Testament is better preserved and more numerous than any other ancient writings.[3] This leads to a rational basis for believing that what the New Testament says about Jesus is reliable. I also believe that having faith itself is warranted[4] and that there are strong philosophical[5] and scientific[6] reasons for belief in God. Not

[3] See, for example, "What's so great about Christianity?" by Dinesh D'Souza or "The case for Christ" by Lee Strobel or "The book that made your world" by Vishal Mangalwadi as recent popular examples of rational Christian discourse, among the many other more classical volumes such as those by C. S. Lewis and Norman Geisler's "Christian Apologetics."

[4] See discussion of, for example, Alvin Plantinga's "Reformed Epistomology" in P. Forrest, "The Episolmology of Religion," *Stanford Encyclopedia of Philosophy*, (Spring 2013 edition) Edward N. Zalta (ed.) URL=<http://plato.stanford.edu/entries/religion-epistemology/>.

[5] For example, in a recent New York Times interview, philosopher Alvin Plantinga argues against the rationality of outright atheism: "But lack of evidence [for the existence of God], if indeed evidence is lacking, is no grounds for atheism. No one thinks there is good evidence for the proposition that there are an even number of stars; but also, no one thinks the right conclusion to draw is that there are an uneven

thinking through our faith might even be considered sinful.[7] Indeed, we must remember that Christianity is the religion of the "Logos," or the rational utterance (Reason) of God. Nevertheless, I *am* suggesting is that there is a persistence of ambiguous language, strange mysteries, and difficult paradox in orthodox doctrine.[8] So what is a rational person to do with *that*? Does it leave our Theology open to ridicule from even more rational folks?

Scientific Mysteries. In 1960, the Hungarian physicist and Nobel Laureate Eugene Wigner published a rather philosophical essay entitled "The unreasonable effectiveness of mathematics in the natural sciences."[9] In that work, he wonders why so many of our mathematical models, that are known to be wrong, inexplicably work in unexpected situations or display amazing accuracy. Consider, for example, that through some very scanty empirical observations, Sir Isaac Newton established[10] the laws of motion and gravitation that rely on relatively simple (to the mathematician) freshman-level calculus. But these laws have proven themselves to be accurate to less than one ten thousandths of a percent, on any object (apples *and* oranges), and on any size scale (less than the width of a hair to the largest galaxies). This is much beyond any reasonable expectation of such a basic mathematical concept (the second derivative). We also know that Newton's Law

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number of stars. The right conclusion [or the rational, justified attitude] would instead be agnosticism." Interview by Gary Gutting, "Is Atheism Irrational?" *New York Times*, February 9th, 2014 [http://opinionator.blogs.nytimes.com/2014/02/09/is-atheism-irrational/].

[6] Several books are relevant here: "Show me God: what the message from space is telling us about God" by Fred Heeren, "The language of God" by Francis Collins, "Being a Christian in Science," by Walter Hearn, among many others.

[7] As mentioned in John Piper's "Think: the life of the mind and the love of God" (Crossway, 2012).

[8] A more recent discussion of the paradoxes of Christian orthodoxy and a potential solution can be found in "Paradox in Christian Theology: An Analysis of its Presence, Character, and Epistemic Status," by James Anderson.

[9] E. P. Wigner, "The unreasonable effectiveness of mathematics in the natural sciences." Richard courant lecture in mathematical sciences delivered at New York University, May 11, 1959. *Comm. Pure Appl. Math*., 13: 1–14. (1960).

[10] From Newton's *Philosophiæ Naturalis Principia Mathematica*. First published 1687.

of Gravitation and Albert Einstein's General Theory of Relativity are completely incompatible with the Standard Model of modern particles physics, suggesting that something is fundamentally wrong with one or all of these theories that can be accurate to within one part in a billion.[11] Or consider the extremely crude[12] "free electron model" that accurately predicts the electrical behavior of nearly every natural material over 26 orders of magnitude (100,000,000,000,000,000,000,000,000). Finally, consider that predicting the "energy levels" of helium with equations that were designed specifically with hydrogen in mind were found to be accurate to within one part in ten million! About this, Wigner said, "It is difficult to avoid the impression that a miracle confronts us here." Physics, being fluent in the language of mathematics, is based on this "miracle" and requires a certain "article of faith" to actually get anything done. Wigner concludes: "…fundamentally, we do not know why our theories work so well. Hence, their accuracy may not prove their truth and consistency." In other words, nobody knows why Science is even possible, only that Nature happens to be accommodating. Einstein concluded as much: "Insofar as mathematics is exact, it does not apply to reality; and insofar as mathematics applies to reality, it is not exact." So if mathematical rigor and logic can't prove the truth behind any scientific theory, then why are they so inexplicably precise? Therein lies a deep mystery…

Less philosophically, let's consider a more innocent question: "What is light?" This is appropriate, since light plays a critical role in how the Internet delivers its data, in

[11] For more information, see E.G. Adelberger, B.R. Heckel, and A.E. Nelson, "Tests of the Gravitational Inverse-Square Law," *Annu. Rev. Nucl. Part. Physics*. 53, 77 (2003).
[12] The "free electron model" doesn't take into account the fact that the electrons might bump into one another. In solid materials, that assumption is crazy.

modern medicine, in energy, and in many, many other applications.[13] To a scientist, light is a tool. But light is also mystery: it has no mass yet packs a (tiny) punch when it hits; it travels in straight lines but also spreads out;[14] when two light beams arrive at the same spot, they can both disappear (!); when the brightness of a light beam is turned way down, it becomes "grainy" in that little packets of *something* arrive one at a time instead of a continuous beam. Some of these facts pertain to particles: localized BBs of light, or "corpuscles" as Newton called them. But some of these facts pertain to the behavior of waves that are delocalized and spread out and interfere with other waves, a theory championed by the great Dutch scientist Christiaan Huygens.[15]

In an attempt that firmly established the wave theory of light, in 1865 the Scottish physicist James Clerk Maxwell published[16] his crowning achievement: "Light is a wave of electric and magnetic fields." Ever since ancient Greeks would rub amber with cloth to create static cling and puzzle over the magnetic attraction of lodestones, electricity and magnetism were seen as two distinct phenomena. That all changed relatively quickly from between about 1770 to 1870. The culmination of work by many scientists such as Charles-Augustin de Coulomb and Michael Faraday, Maxwell's equations, as they are now known, are often emblazoned on physicists' T-shirts with a sort of spiritual reverence. In one of the most significant "eureka" moments in science, when combined in

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[13] In fact, this year (2015) is also the "International Year of Light" [www.light2015.org], as proclaimed by the UN General Assembly, to celebrate and raise awareness about the role light has played in science, technology, and our modern lives.

[14] This "spreading out" of light waves is called *diffraction* and it puts a severe limit on how small of an object we can directly "see" with light. A colleague of mine once joked that diffraction was perhaps a consequence of original sin.

[15] While Huygen's admired Newton's work on optics and prisms, their disagreement about the nature of light was not their only point of contention: about Newton's newly developed theory of Universal Gravitation, Huygen's said "it appears to me absurd." But because of the weight of Newton's opinions, the work of a later proponent of the wave theory of light, Thomas Young, was said to be "destitute of every species of merit."

[16] In addition to being the "International Year of Light," you may have noticed that 2015 is also the 150th anniversary of the publication of Maxwell's equations. Celebrate!

a certain way, these equations describe a wave that propagates at *exactly* the measured speed of light. In one stroke, Maxwell discovered that light waves were intimately linked to the vibrations of electric and magnetic fields. We call these waves more generally "electromagnetic" waves, among which light (or rather *visible* light) is just an infinitesimal fraction.[17] This was a surprising discovery, and Maxwell himself had to be rather blunt in making this connection between electricity, magnetism, and light:

> The value of v [the velocity of light] was determined by measuring the electromotive force with which a condenser of known capacity was charged, and then discharging the condenser through a galvanometer, so as to measure the quantity of electricity in it in electromagnetic measure. *The only use made of light in the experiment was to see the instruments.*[18] (italics mine)

Satisfied, physicists turned to other matters.[19] Enter Einstein. Along with many other physicists including Max Planck, Erwin Schrödinger, Werner Heisenberg, Louis de Broglie, and Niels Bohr, the theoretical utility of treating many phenomena to have a "quantum" or "discrete chunk" of energy emerged. In 1921, Einstein received the Nobel Prize for his "discovery of the law of the photoelectric effect" that relied explicitly on the quantum nature of light. This light particle is known as the *photon*. So light is a paradox. Maxwell's (correct!) equations cannot tolerate the photon; Einstein's universe (correct!)

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[17] Indeed, one of the more fascinating aspects of Maxwell's electromagnetic wave theory of light is that radio waves, microwaves, infrared waves, visible light, ultraviolet light, and x-rays are all of the same substance and travel at the same speed, but just at different frequencies or wavelengths.

[18] James C. Maxwell, "A dynamical theory of the electromagnetic field," *Phil. Trans. R. Soc. Lond.* 155, 459-512 (1865).

[19] It was still unknown, however, through which *substance* light wave vibrations propagated. All waves known at the time required *something* (e.g. sound through air, ripples through water, plucks through a violin string, etc…) to vibrate. A "luminiferous ether" permeating all of space was proposed, but later discredited rather unintentionally in the 1880s by the experiments of Albert Michelson and Edward Morley in, of all places, Cleveland, Ohio. For an enjoyable account of this late 19th / early 20th century physics turmoil, along with many other stories, refer to Bill Bryson's "A short history of nearly everything."

relies on it.[20] Of this Einstein said: "Every physicist thinks that he knows what a photon is. I spent my life to find out what a photon is and I still don't know it."[21]

But it gets even weirder. Quantum mechanics says that *all* matter is both wave and particle.[22] Physicists call this concept "duality." For example, consider the electron, the unit of electricity. It turns out that while electrons have mass, they don't have any definitive size, position, or extent. There is not a tiny speck orbiting every nucleus of every atom, and while we can't tell where the electron is, we sometimes see it gently spreading out, as a wave would do. But an electron is *something*, because it has mass, and that *something* arrives one at a time. This is shown most strikingly in Figure 1.

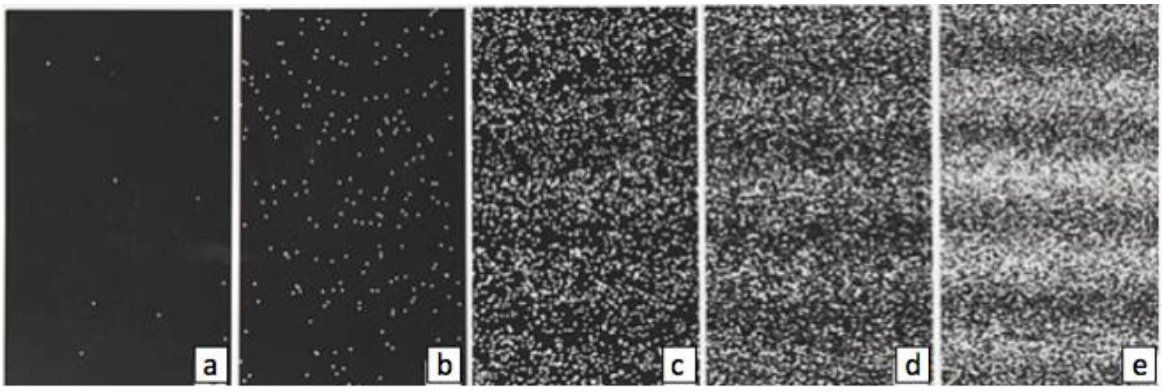

Figure 1: A "Young's Double-Slit Interference" experiment with *electrons*. They arrive one at a time (each little "dot" is a single electron or *particle*) and just like the artistic technique of pointillism, an image slowly emerges (a-e). Amazingly, the final panel (e) shows a clear "wavy" pattern, proving that these individual electrons are indeed behaving as *waves* would. A very similar experiment, with very similar results, can be done with *photons*. This data shows us that the electron was a particle when it hit the screen but a wave as it passed through the "Double-Slit" apparatus. So we can't know which reality (wave or particle) is "real."[23]

Science likes to take the world apart and build it up, piece by piece. We can often work with each piece alone, or two or three pieces together, but how much do we really

[20] High-energy photons are known as x-rays. Even higher energy photons are known as gamma rays. It is these gamma rays that are created when matter and anti-matter annihilate each other. So there is also a deep link between light, energy, and matter, even though light has no mass. Einstein's famous equation $E = mc^2$ provides this particular link.
[21] Quoted in Eugene Hecht, "Optics" 3rd ed., Chapter 1. (Addison-Wesley, 1998).
[22] Particles like electrons are "quanta" of the waves described by the Schrödinger equation; photons can be viewed as "quanta" of the waves described by Maxwell's equations.
[23] Image courtesy wikimedia.org and used under the Creative Commons license.

understand when it is all placed back together? The answer, especially since some of those pieces are paradoxical, mysterious, and altogether unnerving is "not much." But we must go on, and to most effectively describe this tension, physicists cannot use only words. Rather, it must be expressed as an equation:

$$p = \frac{h}{\lambda}$$

The equal sign means "is," the p means "a moving object," and $\frac{h}{\lambda}$ means "a wave."[24] This equation, one of the foundations of all of modern physics,[25] is a beautiful poem that reads: "A moving object is a wave." This short equation, conjured by the giants of modern physics, is an evocation of a very weird reality.[26] Of course, Science must avoid

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[24] The h is known as "Planck's Constant" and provides a basic energy, time, length, and mass scale where quantum effects become important. It is a very small number: 6.6×10^{-34} with units of "Energy-Seconds." Using this equation, a speeding bullet may have a wavelength of something like 10^{-34} meters, much, much smaller than the width of a single atom. So duality is typically only relevant in the tiny world of photons, electrons, and atoms, although recent experiments have shown some very large molecules behaving as if they were indeed "matter waves." See, for example, [M. Arndt, *et al.*, "Wave-particle duality of C_{60} molecules," *Nature* 401, 680 (1999)].

[25] This wave / particle duality of matter is known as the "de Broglie hypothesis" after Louis de Broglie, a 20th century French physicist. After a long period of solitude and meditation, he extended Einstein's startling explanation of the particle nature of light to *all* matter— an idea he himself labeled "disturbing and badly-defined." But, it was experimentally verified a few years later, winning de Broglie the Nobel Prize.

[26] Another extremely mysterious outcome of quantum mechanics is that it firmly established "probability" as fundamental to our knowledge of physical systems before it is measured. Newton (and Einstein, too, when he declared that "God does not play dice.") clearly favored a physical universe that evolved from state A to state B based strictly on deterministic physical laws without random probability. Einstein, along with Planck, Schrödinger, and others thus thought that quantum mechanics, in spite of its vast utility, was ultimately incomplete. Bohr would chide that belief, saying it was equivalent in form to: "We may hope that it will later turn out that sometimes $2 \times 2 = 5$, for this would be of great advantage for our finances." And after Einstein's death in 1955, his rejection of Bohr's interpretation of quantum mechanics was effectively overruled through further experiments. Bohr's "Copenhagen interpretation" became rather doctrinal for a time, although it has been revisited as "vague" and perhaps "incomplete" in itself, with some physicists today preferring an even more bizarre theory of many-worlds. After some of the dust had settled, Heisenberg of the famed "Uncertainty Principle" claimed that quantum mechanics had defined a whole new type of Science distinct from Newton that "does not simply describe and explain Nature; it is a part of the interplay between Nature and ourselves; it describes Nature as exposed to our questioning." This interplay between the observer and the experiment also leads to other paradoxes, namely "quantum entanglement" whereby two photons can be "linked" to each other, so that when one is "seen" the other one immediately "knows" that it was seen and changes its own behavior even if it is miles away at the time or perhaps in another galaxy. Einstein called this possibility "spooky action at a distance" (and it formed the core of his critique) but, to the best of our abilities, it is so far proven to be real. Amazingly, physicists have recently even taken a picture of an object using photons *that never directly interacted* with that object

paradox at all costs. To that end, Bohr's "Complementarity Principle" effectively says: "If you measure light to be a particle, it is a particle; if you measure light to be a wave, it is a wave. So don't bother asking which it is: complementarity forbids us from seeing both at the same time." To avoid the paradox, we aren't allowed to know and "must use an ambiguous language rather than an unambiguous language."[27] It reminds me that today we see only a reflection, dimly, as in a mirror. (1 Corinthians 13:12)

Interlude Two. Now is a good time to say here that, of course, no rational person should dismiss quantum mechanics because it "feels weird" or stop using mathematical models because we don't know why they work. But modern physics has struck a blow to pure scientific determinism and emphasized that our models of reality are necessarily incomplete. Science can ultimately only describe Nature, not explain it. Apparently, we are allowed to ask the question "What is light?" but not allowed to know the answer; the reality behind its behavior is inaccessible.[28] Going further, some recent experimental data suggest that an underlying reality that we can measure *may not even exist*.[29] In our culture, scientific truth is often interpreted to be more secure than religious truth. But upon closer inspection, we can see that it sometimes only gives us a "more and more

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except through their "entangled" partners. For more information, see an article in *Nature* about this "paradox." [doi:10.1038/nature.2014.15781].

[27] Werner Heisenber, "Physics and Philosophy: The Revolution in Modern Science." P. 197 (Harper, 1962).

[28] Physicists are still trying to come up with the "correct" interpretation of quantum mechanics, from the traditional "Copenhagen interpretation," to a many-worlds hypotheses, to hidden variables, to pilot-wave theories, nature has indeed dealt us a mysterious hand. Foundational to these disagreements is the question of whether the quantum mechanical "wave function" is a real entity or merely a mathematical construct. Nobody knows. For more information, see, for example: G. P. Collins, "The Many Interpretations of Quantum Mechanics," *Scientific American*, November 19, 2007. Or perhaps de Broglie himself will provide another clue with a particle *and* wave instead of a particle *or* wave interpretation, with recent hints provided by, of all things, droplets bouncing over the surface of a liquid. See, for example, J. M. W. Bush, "The new wave of pilot-wave theory," *Physics Today* 68, 46 (2015). In any case, the debate is still open.

[29] P. Ball, "Physicists bid farewell to reality?" *Nature* [doi:10.1038/news070416-9], commenting on: S. Gröblacher, *et al*. *Nature*, **446**. 871 - 875 (2007).

sophisticated view of our own ignorance."[30] Indeed, there are many other strange[31] and inexplicable[32] things that Science has uncovered. But, Wigner concludes that these mysteries, especially those beyond the logical grasp of Science, are "a wonderful gift which we neither understand nor deserve."

The Source of Mystery. So perhaps these weird mysteries and apparent paradoxes in Theology and in Physics are actually a blessing in disguise. Here's how: it is in the appropriateness and presence of mystery that we can see glimmers of a deeper Truth. This is rather thrilling, for these "rumors of another world"[33] are always nudging at our hearts, pointing us to a "deeper magic from before the dawn of time."[34] So we should have a plausible *expectation* of mystery because: (1) God is vastly more incomprehensible than we can ever acknowledge; and (2) The universe is filled with more wonder than we've ever imagined or perhaps will ever know. God's thoughts are not our thoughts. (Isaiah 55:8-9) Mystery in this sense bears the mark of transcendent origin. C. S. Lewis said it this way:

> Reality, in fact, is usually something you could not have guessed. That is one of the reasons I believe Christianity. It is a religion you could not have guessed. If it offered us just the kind of universe we had always expected, I should feel we were making it up. But, in fact, it is not the sort of thing anyone would have made up. It has just that queer twist about it that real things have. So let us leave behind all these boys' philosophies — these

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[30] Warren Weaver, director of the Rockefeller Foundation's Division of Natural Science from 1932-1955. Through his efforts of channeling significant money, he is sometimes credited with launching modern experimental biology. Along these same lines, an accessible book titled ""No small matter: science on the nanoscale," by F. C. Frankel and G. M. Whitesides, describes in very poetic language and beautiful imagery the quandaries, mysteries, and limitations of our current scientific understanding.

[31] For example, Einstein's theories of "Special Relativity" (clocks that are moving and clocks that are standing still will run at different rates because *time slows down*) and "General Relativity" (that space-time itself is warped by gravity, allowing differences in gravity itself — like being on Earth vs. up in space — to slow down time, too.

[32] Such as the exact fine-tuning of fundamental physical parameters, as if the Universe "must have known we were coming." [Freeman Dyson, "Disturbing the Universe," (Harper, 1979).]

[33] Philip Yancey, "Rumors of another world: what are we missing?" (Zondervan, 2003).

[34] As described by the lion Aslan, from C. S. Lewis's "The lion, the witch, and the wardrobe."

> over simple answers. The problem is not simple and the answer is not going to be simple either.[35]

The fascinating behavior and peculiarity of just about anything we discover through Science also bears the same "something you could not have guessed." (Bohr, with typical bluntness, said it this way: "We are all agreed that your theory is crazy. The question that divides us is whether it is crazy enough to have a chance of being correct.") Nature didn't have to be this way, and that God has given us such a "crazy" universe for us to study is truly a gift.

I want to proceed carefully now, because I am not trying to use the "unknowns" of Science as an opportunity to invoke God. The danger of such a "God-of-the-gaps" argument is easily understood if Science would someday discover its own rational explanation. This happens all the time. While some examples I'm talking about here do push up against the edge of what Science *can ever* know, I'm also simply trying to provide a sense of the wonder, beauty, and mystery that confronts us.

So seeing this path in Science that points beyond all possible human understanding, how do we view its relationship with Theology? Here, a model can be helpful: God has revealed his "deeper Reality" to us through two "books" upon which all our Science and Theology are based. These are, of course, the Book of Nature and the Book of Scripture, diagramed in Figure 2.[36] In His wisdom, this happens to be the amount and sort of evidence that God has chosen to give us, and it is therefore entirely sufficient.

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[35] C. S. Lewis, "Mere Christianity," (Macmillan Co., 1943).

[36] The concept of "Two Books" is hinted at in Scripture (e.g. Romans 1:18-21), and goes back to the early Church fathers. For example, Irenaeus of Lyon, who helped canonize Scripture, also battled the Gnostics by affirming the beauty and goodness of Creation. Augustine, who read the Book of Scripture by attending to the intentions of the original authors, also paid particular care to the Book of Nature, careful not to let non-Christians have room to "criticize and reject" Christians in their ignorance of Nature. And paraphrasing Galileo Galilei, the Book of Nature can be read and comprehended through the language of mathematics whereas the Book of Scripture teaches us "how to go to heaven, not how the heavens go."

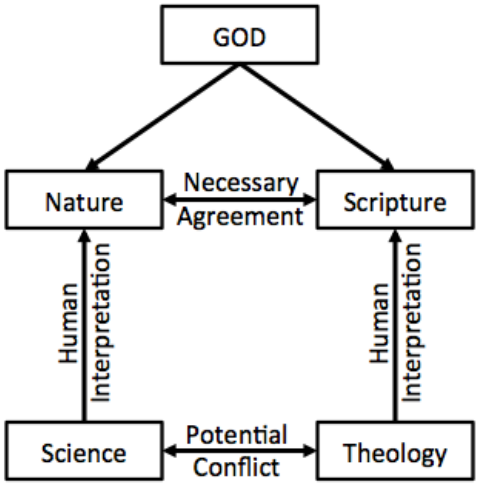

Figure 2: A "two book" model of reality where God is the ultimate and entirely consistent author of both Nature and Scripture. Our (fallible) human interpretations of both books can sometimes lead to conflicts between Science and Theology. Our interpretations are also limited, leading to paradoxes, perceived contradictions, and unresolved mysteries in both Science and Theology. Diagram adapted from the BioLogos foundation. [www.biologos.org]

I find this "Two Book" model helpful because Christianity, among all of the other religions, has a lot to say about the physical world. We know it is designed to be good (Genesis 1), are mandated to care for it (Genesis 2:15), are prone to marvel at it (Psalm 8), are amazed that God himself would become part of it (John 1:14), and are promised that it will be made new (Isaiah 65). We should also then gladly interpret Nature through our (fallible and limited) human process of Science. It is therefore entirely possible — and unsurprising — that conflicts arise when we are also interpreting Scripture through the parallel (fallible and limited) human process of Theology. In this model, our Theology can inform (but not replace) our Science and vice versa. For example, perhaps the concept of quantum mechanical "complementarity" described above can be useful (to some folks) in understanding the nature of the God-man Jesus. Or perhaps the relativity of the passage of time in Einstein's equations can help us appreciate the reality of God's own timing (2 Peter 3:8). Perhaps. But even more importantly, the realities encountered in Nature (rightly interpreted) have necessary agreement with Scripture (rightly

interpreted), since both come from God. Indeed, the divine Reason of God perfectly straddles Nature and Scripture through the Incarnation.

But Figure 2 also shows that it is inappropriate to read Science directly into Scripture (e.g. interpreting Genesis 1 as a scientific text) or to read Theology directly into Nature (e.g. evoking God to explain some as-yet-unexplained physical phenomenon or, the other way around, denying the omnipotence of God based on a scientific understanding of planetary motion). Rather, Christians can maintain that "all truth is God's truth," whether that truth came from Science or from Theology. It is therefore ridiculous to say, "I only believe in Christian physics." One of the "fathers of quantum physics" Max Planck said: though Science and Religion are "different both in their starting points and in their methods," they share the same goal, namely, "recognition of an omnipotent intellect ruling the universe." Again, from Planck: "These absolute values in Science and ethics [Religion] are the ones whose pursuit constitutes the true task of every intellectually alert and active human being."[37]

Because of these Two Books, Christians are ultimately unimpressed by the scientific bravado of professional atheists[38] and unflustered by apparent theological conundrums. Unfortunately, ever since David Hume separated the ethical "ought" from the scientific "is," Science and Theology have drifted apart.[39] Where reading the Book of Nature was once seen as morally uplifting the scientist-priest, modern "scientism" has tried to engulf, discredit, or explain away ethics, morality, and religion. Regrettably, Christians have sometimes drifted away from or resisted Science as well. For me, this is especially true

[37] Max Planck, "Scientific Autobiography and Other Papers," (Philosophical Library, 1968).
[38] See, for example, "The God Delusion," by Richard Dawkins or "God is Not Great," by Christopher Hitchens.
[39] For an interesting and discussion of this history, see, for example, "The virtue of scientific thinking," Steven Shapin, *Boston Review*, January, 2015. [http://bostonreview.net/steven-shapin-scientism-virtue].

when we intentionally or unintentionally deny Science its rightful purview of natural phenomenon, leading to "bad" science.[40] But we, of all people, should be champions of Science! St. Augustine certainly had something to say about this:

> Now, it is a disgraceful and dangerous thing for an infidel to hear a Christian, presumably giving the meaning of Holy Scripture, talking nonsense on these topics [Science]; and we should take all means to prevent such an embarrassing situation, in which people show up vast ignorance in a Christian and laugh it to scorn.[41]

Finally, because we recognize Science and Theology as limited human endeavors because of the profound mysteries they uncover, it is not that troubling to admit that unresolved tensions could exist between them. It is perhaps even honest to admit that some of these tensions themselves appear legitimately paradoxical and may never be solved. For example, since God is active, listens to prayers, and occasionally intervenes through miracles, what of Natural Law and the fact that every physical event has a physical cause? Or what of the fact that we are physical creatures that must obey the Laws of Physics, yet we are also in communion with an infinite and eternal Spirit? It is abundantly worthwhile to wrestle with these questions, where Theology bears the burden of Science or the other way around. But we may never *completely* know the answers this side of glory. So, ultimately, this is a call to faith and a call to humility. Do we force Scripture to conform to our own preferred version of Theology? Do we force Nature to conform to our own preferred version of Science? Then neither should we force Science into our own preferred versions of Theology, or Theology into our own preferred versions of Science. A rational person is required to alter how we *want* to view the world

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[40] The opposite happens all the time, too, when scientists try to deny theists their rational belief in God based upon empirical evidence and naturalism alone. It is important to mention here that Science cannot prove naturalism and materialism to be valid because it assumes them from the start!

[41] Excerpted from St. Augustine, *The Literal Meaning of Genesis*, translated and annotated by John Hammond Taylor, SJ, New York: Paulist Press (1982).

by looking at how it actually *is*. This is not easy. But we can trust that God, the ultimate author, has provided sufficient evidence for us to approach — though perhaps never fully comprehend — who He is. In this manner, the mysteries we encountered earlier are only paradoxes of our limited languages [Theology, Physics] and not of His realities [Scripture, Nature]. Indeed, "language can be a window through which one glimpses God, but never a box in which God can be contained."[42] And although many scientists sadly never go much beyond a deep admiration of the mysterious as a sort of vestigial spiritual experience,[43] Christians can more fully embrace the beauty of it all. So with that, I'll end with an excerpt from a favorite hymn: [44]

> For the wonders that astound us,
> for the truths that still confound us,
> most of all that love has found us,
> thanks be to God.

[42] Brian D. McLaren, "A Generous Orthodoxy," (Zondervan, 2004). Paraphrasing C. S. Lewis.
[43] For example, see Max Jammer, "Einstein and Religion," (Princeton University Press, 1999). In there, Einstein is quoted as saying: "I am of the opinion that all the finer speculations in the realm of science spring from a deep religious feeling, and that without such feeling they would not be fruitful." In Einstein's view, "religious" is different from "religion." Today, people would probably say something like: "I'm spiritual, but not religious." But the sentiment is *often* there, it is natural, and it can be an evangelistic hook!
[44] Fred Pratt Green, "For the fruit of this creation," 1970.