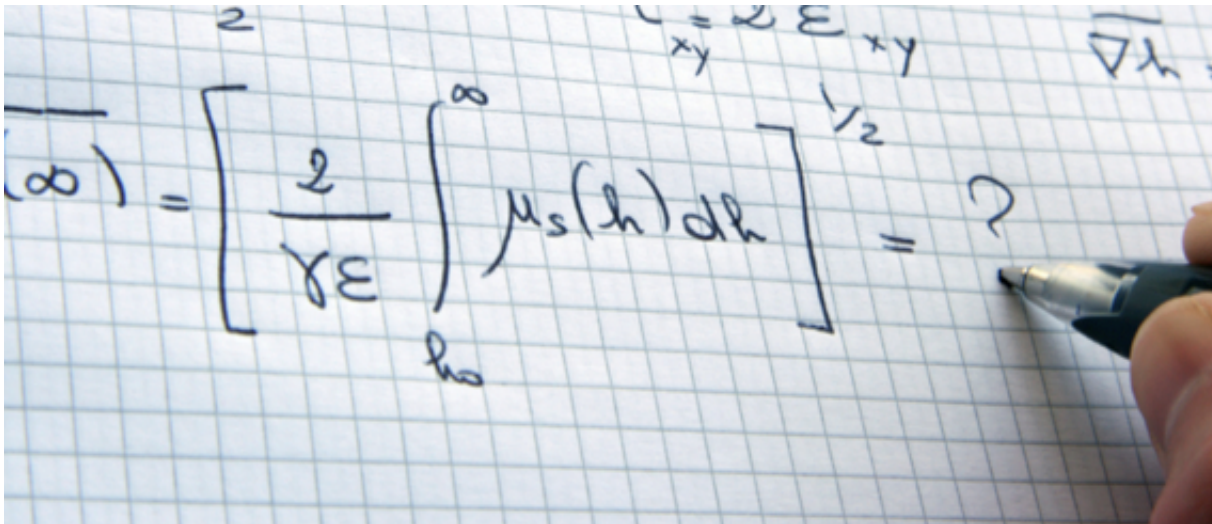


## What is a God-of-the-Gaps argument? Are fine-tuning and morality just new examples of this?



### Defining God-of-the-Gaps

---

God-of-the-gaps arguments use gaps in scientific explanation as indicators, or even proof, of God's action and therefore of God's existence. Such arguments propose divine acts in place of natural, scientific causes for phenomena that science cannot yet explain. The assumption is that if science cannot explain how something happened, then God must be the explanation. But the danger of using a God-of-the-gaps argument for the action or existence of God is that it lacks the foresight of future scientific discoveries. With the continuing advancement of science, God-of-the-gaps explanations often get replaced by natural mechanisms. Therefore, when such arguments are used as apologetic tools, scientific research can unnecessarily be placed at odds with belief in God.<sup>1</sup> The recent Intelligent Design, or ID, movement highlights this problem. Certain ID arguments, like the irreducible complexity of the human eye or the bacterial flagellum, are rapidly being undercut by new scientific discoveries.

### Illustrating God-of-the-Gaps

---

The familiar story of Isaac Newton and Pierre Simon de Laplace is a classic example of the God-of-the-gaps argument. Newton devised a mathematical equation for the force of gravity that he used to explain and predict the motions of planets with outstanding accuracy. With pencil and paper, the orbit of the planets around the sun could be calculated with great precision. But planets also have gravitational interactions with each other, not just with the sun. For example, when the Earth passes Mars in its orbit around the sun, there is a small but significant gravitational interaction between Mars and Earth. Because these tiny interplanetary interactions occur often — several times per year in many cases — Newton suspected that these gravitational perturbations would accumulate and slowly disrupt the magnificent order of the solar system. To counteract these and other disruptive forces, Newton suggested that God must necessarily intervene occasionally to tune up the solar system and restore the order. Thus, God's periodic special actions were needed to account for the ongoing stability of the solar system.

Newton also thought that God was necessary to explain how the planets all happen to be travelling around the sun in the same direction and in the same plane. His theory of gravity was entirely compatible with planetary motions in any direction and with orbits tilted at any angle to the sun. But this is not what we find. The planets travel in the same direction, and almost all of their orbits are in the same plane. The planets move around the sun like runners on a track: very orderly. Newton thought only God could have set things up so elegantly:

"The six primary Planets are revolv'd about the Sun, in circles concentric with the Sun, and with motions directed towards the same parts, and almost in the same plane. [...] But it is not to be conceived that mere mechanical causes could give birth to so many regular motions. [...] This most beautiful System of the Sun, Planets, and Comets, could only proceed from the counsel and dominion of an intelligent and powerful Being." <sup>2</sup>

In both of these examples — one related to the ongoing motion of the planets and the other related to the origin of the motions — Newton is employing textbook God-of-the-gaps reasoning. Scientific theories are proposed to explain as much as possible, and then God is brought in to cover any remaining unexplained gaps in the explanation.

We now know that Newton was wrong on both counts. The gravitational perturbations that planets experience are so completely balanced that they average out to zero over time. The net result is that the planetary motions are stable; they do not deteriorate over time. And it was a straightforward application of Newton's theory that revealed this. Newton simply had not done all the calculations to see if his intuition was right. The same was true for the orderly motion of the planets. Newton had no concept of how solar systems could form on their own or what the planetary motions would be like in naturally forming systems. Astronomy simply had not developed

to this point. In the decades after Newton, astronomers discovered that solar systems form naturally from large clouds of rotating matter. Therefore, a large, slowly rotating cloud collapses under its own gravity, and it tends to flatten into something like a pancake. Saturn's rings are an interesting example where the cloud is still present. The material collects into big clumps in the plane of the pancake. After the process is completed, a collection of clumps all travelling in the same direction and in the same plane exists — just like our solar system.

Such episodes in the history of science are not unusual. In fact they are so common that the phrase God-of-the-gaps has been coined to label the process of invoking God to account for natural phenomena that is not explained by science. The dangers of such God-of-the-gaps reasoning were highlighted a century after Newton by a situation involving the French mathematician Pierre Simon de Laplace who held a bureaucratic post in Napoleon Bonaparte's administration. Laplace was the beneficiary of a remarkable century of progress in refining and extending Newton's laws of motion and expanding the vision of what was going on in space. As a result, he was able to write a wide-ranging text explaining the mechanics of the heavens without invoking divine intervention.

As legend goes, Laplace was questioned by Napoleon about the absence of God in his theory: "M. Laplace, they tell me you have written this large book on the system of the universe, and have never even mentioned its Creator." To this, Laplace famously replied, "I had no need of that hypothesis." Of course, God can be still be used as a hypothesis for the existence of the universe. But because Newton had used a deficiency in scientific explanation as an argument for God's existence, Laplace's theory delivered an unnecessary blow to the apologetics of the time. Herein lies the danger: If gaps in scientific knowledge are used as arguments for the existence of God, what happens when science advances and closes those explanatory gaps?

## Pointers to God: Fine-Tuning and the Moral Law

---

In the first and third chapters of *The Language of God*, Dr. Francis Collins mentions pointers to God that played a role in his journey to faith. One of these pointers is the fine-tuning of the universe. Fine-tuning refers to the way the basic laws of physics appear to be delicately balanced for life. This precision calls for an explanation that science cannot provide. There is a spirited debate over the meaning of fine-tuning, and some critics charge that invoking God as the fine-tuner is a return to the God-of-the-gaps. But there does not seem to be any way to explain the detailed properties of the laws of nature from within science. Fine-tuning arguments thus go beyond science into metaphysics to explain why the world that science studies has the properties that it does. Another pointer that Collins mentions, following C. S. Lewis, is the moral law. The moral law is an implicit and universal standard of ethics for humanity. Collins describes morality as a

universal law, which, unlike laws such as gravity, is broken very often. Overall, the moral law is consistent with the type of behavior that is expected of products of evolution. However, as Collins points out, altruistic behavior often seems to go beyond what would be expected from the best-established processes of Darwinian evolution.<sup>3</sup> Mathematical models developed by theorists like Martin Nowak<sup>4</sup> have established that natural selection can produce genes for altruism, but the radical self sacrifice of great saints like Mother Theresa of Calcutta seems to go beyond what the models can account for. A completely natural account of our origins may be insufficient to explain present observations of human behavior. However, if evolutionary psychology could explain human morality, or if theoretical physics could explain such perfect constants of nature, would theistic apologetics be discredited in any way?

## Fine-Tuning

---

Unlike a God-of-the-gaps argument, the argument for fine-tuning uses science without divine action to reveal the impeccable precision of our Universe.<sup>5</sup> Fine-tuning is described in terms of physical constants and the initial conditions of our universe. Fine-tuning does not try to draw attention to where science has failed, but rather emphasizes how science has revealed the intricate balance of the universe.

One might argue that science could potentially explain the origins of these delicately balanced features, but there are two important things to keep in mind. First, it is very *unlikely* that a scientific theory could explain away the improbabilities of our Universe without raising other improbabilities.<sup>6</sup> Second, an argument for fine-tuning is unlike a God-of-the-gaps argument in that it is not intended to prove God's existence. While it is true that the fine-tuning of the Universe adds credence to belief in a creator, such recent scientific findings could hardly be called upon as the basis or justification of the long history of theistic belief. While the fine-tuning of the Universe *does* indeed lead many people to consider the possibility of God's existence, the fact that science cannot disprove God's existence assures us that it also cannot prove it. Instead, fine-tuning can be understood as a feature of the universe that is accordant with belief in a creator. A deeper scientific explanation of these features — albeit highly unlikely — would not ruin its usefulness as a pointer to God.

## Moral Law

---

The moral law also offers evidence that the world has evolved in a way that is consistent with the belief in a good and loving God. This remains true whether science eventually finds an account or explanation for morality. Even if a purely natural account of moral development

could be found, the simple fact that morality has evolved is something that would be expected in a world created by a just and loving God.

Evolutionary theory explains selfishness in a most obvious and natural way. Altruism is far less obvious, but it can also be explained by recognizing that humans evolved in tribes that were essentially extended families with many genes in common. Imagine two tribes, one has genes to help each other even when it requires sacrifice and one does not have such genes. Which tribe will flourish? In such ways, genes for altruism can be selected by nature and spread in a population. But in its most radical form, altruism refers to situations where individuals risk their very lives to help someone they do not even know, and from whom a reciprocal benefit is unexpected or even unimaginable. This concept runs counter to the behavior expected from the best-established processes of evolution, and there are no widely accepted theories that can fully account for such examples. Some have suggested that radical altruism might perhaps be explained as misfiring — we mistakenly go overboard in our desire to be nice. Radical altruism is currently somewhat mysterious.

As with most situations, science may someday provide an explanation for altruism. In light of that possibility, the argument from the moral law as a pointer to God is subject to the same risk of explanation as Newton's God-of-the-gaps argument. If radically altruistic behavior is someday given a natural evolutionary explanation, it will no longer stand out as an inconsistency in evolutionary theory. However, Robert Wright argues in *Non-Zero: The Logic of Human Destiny*, that the evolution of altruism can be explained as an application of game theory.<sup>7</sup> In Wright's view, the deep mystery is not altruism itself, but the intriguing mathematical structures of the universe, like game theory, that can coax from the universe surprising behaviors like altruism.

## Conclusion

---

If gaps in scientific knowledge are the basis for belief in God, then as science progresses, evidence for God's existence continually diminishes. Fine-tuning does not rely on divine action as an explanation, but points out the striking precision of nature's order in line with the requirements for human life, thus establishing a mysterious connection between physics and biology. As for the moral law, its use as a pointer to God can be understood in that human behavior has evolved in a way that is consistent with the idea of a good and loving creator. Belief in any moral truth rests upon the assumption of God's existence or some other ultimate standard.

Finally, although these pointers to God should encourage one to consider God's existence, they must not be placed at the foundation of faith. The belief in a creator and the experience of a

relationship with God should not rest solely on a logical or scientific justification. But then, as Collins himself wondered, “How can such [religious] beliefs be possible for a scientist? Aren’t many claims of religion incompatible with the “Show me the data” attitude of someone devoted to the study of chemistry, physics, biology, or medicine?”<sup>8</sup>

### **Consulted Experts:**

*The BioLogos Foundation is grateful for the assistance of [Ted Davis](#) in drafting this response.*

## Notes

---

1. Francis S. Collins, *The Language of God: A Scientist Presents Evidence for Belief* (New York: Free Press, 2006), 93.
2. Sir Isaac Newton, *Isaac Newton's Philosophiae Naturalis Principia Mathematica*, comp. and ed. Alexandre Koyre and I. Bernard Cohen, rev. ed. (London: Cambridge University Press, 1972).
3. Collins, *The Language of God: A Scientist Presents Evidence for Belief*, 25.
4. *Evolutionary Dynamics*, by Martin Nowak.
5. John Polkinghorne, "The Science and Religion Debate - an Introduction," *Faraday Papers*, no. 1 (2007), [www.faraday-institute.org](http://www.faraday-institute.org).
6. *Ibid.*
7. Robert Wright, *Non-Zero: The Logic of Human Destiny* (Vintage Books, 2001).
8. Collins, *The Language of God: A Scientist Presents Evidence for Belief*, 31.

## Further Reading

---

### Books

---

- Collins, Francis S. *The Language of God: A Scientist Presents Evidence for Belief*. New York: Free Press, 2006. See chapters 1 and 3, “From Atheism to Belief” and “The Origins of the Universe.”
  - Falk, Darrel R. *Coming to Peace with Science: Bridging the Worlds between Faith and Biology*. Downers Grove, IL: InterVarsity Press, 2004.
-