

Explanation

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Why Is Science Possible?'

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Many practicing scientists go about their investigations without asking themselves why it all works. But once we step back to ask deeper questions, the very possibility of doing science seems to be something amazing. Why?

Eugene Wigner, Nobel Prize winner in physics, took the time to step back and express wonder. He wrote a noteworthy article entitled, “The Unreasonable Effectiveness of Mathematics in the Natural Sciences.”² He says: “The first point is that the enormous usefulness of mathematics in the natural sciences is something bordering on the mysterious and that there is no rational explanation for it.”³ And later, “It is not at all natural that ‘laws of nature’ exist, much less that man is able to discover them.”⁴

¹ I am grateful to Steven Huff for suggesting this title. The contents of this essay represent a written analogue of a talk to be given at the “Faith & Science Conference: Genesis & Genetics,” at Evangel University, Springfield, Missouri, sponsored by the Office of the General Secretary of the Assemblies of God, Evangel University, and Pensmore Foundation, June 23–25, 2014. The substance of this essay has considerable overlap with an essay first published as “Why Scientists Must Believe in God: Divine Attributes of Scientific Law,” *Journal of the Evangelical Theological Society* 46/1 (2003): 111–123, and published in revised form in *Redeeming Science: A God-Centered Approach* (Wheaton, IL: Crossway, 2006), chapter 1.

² Eugene Wigner, “The Unreasonable Effectiveness of Mathematics in the Natural Sciences,” *Communications on Pure and Applied Mathematics* 13 (1960): 1–14.

³ *Ibid.*, 2.

⁴ *Ibid.*, 5.

Wigner is right to draw attention to something that practicing scientists usually take for granted, namely that there are such things as “laws of nature.” The scientist takes it for granted. But why should he? Perhaps it is because his teachers before him also took it for granted. But that just pushes the question back into the past. Once Wigner starts asking questions, he finds himself amazed. The whole edifice of science has a foundation on prescientific trust—we might say prescientific faith in the existence of laws of nature. And, according to Wigner, it is “mysterious.” It is not at all obvious why laws of nature even exist. And granted that they exist, why should they be of such a kind that human beings find themselves capable of discovering them?

Laws of Nature

So what are laws of nature? Do we know? The language about *discovering* laws presupposes that the laws are already there before human beings discover them. We *discover* them; we don't *legislate* them.⁵ Isaac Newton was the first to formulate explicitly the law of gravitation that afterwards came to bear his name. But the law was in force all the time. The motion of the planets and projectiles and apples conformed to the law long before Newton formulated it explicitly. Indeed, his formulation was possible only because of the consistent conformity to law that he could observe out in the world.

So we have to make a distinction. We distinguish the law operating in the world from Newton's formulation. Newton's formulation comes from Newton—obviously. But his formulation would draw no interest unless it pointed effectively to a law already previously operating in the world. The real law, we might say, is the law of gravitation operating in the world. Newton's formulation is secondary. And as a secondary formulation, it may be only an approximation or rough expression of the real law. In fact, the advent of Einstein's special and general theory of relativity has revealed that Newton's formulation was indeed approximate. It works best for small velocities and small masses.⁶

Scientists in doing research rely on the existence of many laws of nature, including laws governing the behavior of their measuring apparatus. With these laws already assumed, they are searching for new kinds of

⁵ Poythress, *Redeeming Science*, 16–21; Vern S. Poythress, *Logic: A God-Centered Approach to the Foundation of Western Thought* (Wheaton, IL: Crossway, 2013), appendix F1.

⁶ But not too small: quantum mechanics indicates that we must make adjustments of other kinds in dealing with the very small.

regularity, new kinds of law. What must a “law” of nature be like, even to be a law?

If we think about it, there are several features that typically characterize the idea of law. First, a law must be the same for all locations, for all places. It must hold for places on Earth, places on the Moon, even places in the Sun. If we find, for example, that the force of gravity for an astronaut on the Moon is less than for the same astronaut on Earth, we look for a deeper explanation. In this case, Newton already provided the means for such an explanation, through his formulation of a law that included the masses of the bodies that attracted one another. We observe that the mass of the Moon is less than the mass of the Earth, and that is why (even taking account of the fact that the center of the Moon is nearer to its surface than the center of the Earth is to its surface) the gravitational force on an astronaut on the moon is less. Newton’s law is a general principle that holds both for the Earth and for the Moon.

Second, a law must be the same at all times. The reasoning is similar. If a hypothetical “law” appeared to change over time, we would look for an underlying explanation for the change. There must be a deeper law that explains the change taking place at the level of phenomena.

Third, a law must hold for all times. This principle is simply an implication of its being the same.

Roots in God

These three characteristics of law correspond to attributes or characteristics of God. God is omnipresent—present in all locations. God is immutable—He does not change. And God is eternal—present at all times. Is it an accident that these attributes of God are reflected in the idea of scientific law?

We can extend the list of attributes. God is truthful. And a law, by its very nature, is true, that is, if it is the real law rather than a human approximation.

God is omnipotent. Is the law omnipotent? For God to be omnipotent means that He controls everything, and that there are no exceptions to His control. Likewise, the law controls the world of nature.

We already observed that human beings do not actually legislate laws of nature, in the way a human king or a human legislature could promulgate a new law. The real laws of nature have to be there already. And they have to have “teeth.” The world has to conform to them. In fact, they have more impressive “teeth” than does the law of a human king. Human laws are sometimes disobeyed. But a law of nature, if it is a real law, is not disobeyed. Any apparent exception would be a clue that a man-formulated law was not yet quite right. Scientists would look for clue to explain the exception, using a deeper or more powerful law than the original formulation.

We can extend the comparison between God's attributes and the nature of laws of nature. God is immaterial and invisible, but He makes himself known through His control over what is visible. Laws govern the material, visible things in this world. The laws themselves are immaterial and invisible, but we can discover them because they have effects on what is visible.

Why should there be such a striking match between God and the laws? The Bible indicates that God governs the whole world by His word, by His speech:⁷

And God said, "Let there be light," and there was light
(Genesis 1:3, ESV).

By the *word of the LORD* the heavens were made,
and by the breath of His mouth all their host (Psalm 33:6, ESV).

He [God] sends out His *command* to the earth;
His *word* runs swiftly.
He gives snow like wool;
He scatters frost like ashes (Psalm 147:15–16, ESV).

If a human being speaks truthfully, his words reveal his character. Likewise, God's words reveal His character. For God to create the world by His word, His word has to have His character: it must be omnipresent, eternal, immutable, omnipotent, and so on. The real law governing the world is God's personal speech. Since God is unchangeable and faithful to His promises, the world that God created exhibits regularities and consistencies. Scientists study those regularities. In doing so, they are really studying God's word and His wisdom. They are endeavoring to think God's thoughts after Him.

Thus, the Bible gives the explanation that Eugene Wigner was searching for and did not find. The laws of nature exist because God has spoken the universe into existence and continues to sustain it through His word of power: "He upholds the universe by the word of his power" (Hebrews 1:3, ESV). The Bible also explains why it is that human beings have an ability to discover laws of nature. It states that God made man "in the image of God" (Genesis 1:26–27, ESV). Human beings are creatures; they are finite. But they are very special creatures, whose existence reflects on a creaturely level some of the character of God. This reflection includes our ability to think. When we think, we imitate the original uncreated thinking ability of God.

⁷ Italics in Scripture quotations has been added by the author for emphasis.

Thus the very nature of humanity, as well as the nature of law, reflects the character of God. He displays His glory and His character in the things He has made, as it says in Romans:

For what can be *known about God* is plain to them, because God has *shown it* to them. For his *invisible attributes*, namely, His eternal power and divine nature, have been *clearly perceived*, ever since the creation of the world, in the things that have been made. So they are without excuse. For although they *knew God*, they did not honor him as God or give thanks to him, but they became futile in their thinking, and their foolish hearts were darkened (Romans 1:19–21, ESV).

The Bible also provides an explanation for the relation of miracles to the law. Since the real law is God's speech, miracles are never a "violation" of law. They are thoroughly in conformity with God's plan and with His speech. But His speech is *personal*. At times God can have special purposes, especially in relation to His concern for human beings. These special purposes lead to special words and special events that are outside customary human expectations for regularities of nature. They are outside human expectations, but they are *not* outside God's purposes. They may violate our expectations or guesses about law, but they do not violate the real law, which is God's word.

Dependence and Idolatry

Scientists are continually depending on God. According to Romans 1, they know Him (Romans 1:21). But ever since the fall of Adam, human beings have been in a situation of alienation from God. They suppress what they know of God (Romans 1:18). Romans 1 continues by describing how people evade God by making substitutes for themselves in the form of idols:

Claiming to be wise, they became fools, and exchanged the glory of the immortal God for *images* resembling mortal man and birds and animals and creeping things.

Therefore God gave them up in the lusts of their hearts to impurity, to the dishonoring of their bodies among themselves, because they exchanged the truth about God for a lie and *worshiped and served the creature* rather than the Creator, who is blessed forever! Amen (Romans 1:22–25, ESV).

In the ancient world, idols took the form of statues in the shape of man, birds, or other animals. Nowadays, the substitution frequently takes the form of an *impersonalist* conception of scientific law. Instead of God ruling the

world by speaking, law itself, as a kind of impersonal thing, is just there. Law rules the world, but it is not personal. It is a substitute for God.

This substitute, as we have seen, is close to the real thing. It has many of the attributes of God. The main thing that distinguishes the substitute from the personal God of the Bible is its being impersonal. At least that is how people conceive it. They are coming up with an idea or conception in their mind. It is a kind of mental or conceptual idol.

Law as Personal

Will this idol work? The actual practice of scientists shows that they still depend on the God who is real and who is personal. Even before a new law is discovered, people presuppose that the law is rational. It must be mentally graspable, and must be capable of being rationally understood, if we are to have any hope of finding out what it is. The feature of rationality belongs to persons, not to rocks or plants. Some people might argue that higher animals show a kind of shadow of rationality in their behavior. But the rationality of law is a deep rationality, exceeding in its profundity not only the shadow rationality of animal behavior, but the full rationality of human beings. Rationality belongs to persons, and thus we can see that scientists are actually presupposing that the law is personal.

Scientists also presuppose that the law is language-like. The law “out there,” holding in the world, is not directly “heard” in any human language. But in our secondary descriptions of law we have to be able to articulate its meaning in language. Often our language is quite complex, because the concepts necessary for a full understanding of the law are complex. The law is language-like in this sense. And language—that is, language of this kind of complexity—belongs to persons. The law is personal. Scientists routinely treat the law as rational and language-like in the course of their investigations. Only by suppressing the truth do they later conveniently “forget” this personal character of law, and treat it as an impersonal mechanism.

Proving God?

Can we prove the existence of God by appealing to scientific law? The character of scientific law does not lead to a “proof” of the existence of God in the usual sense. A proof in many people’s minds means a demonstration that starts with known premises and proceeds to deduce something not yet known. But the existence of God is not of this character. According to Romans 1:18–25, every human being already knows God! The problem is not with lack of knowledge, but with spiritual failure. We suppress the knowledge that we have. We make ourselves substitutes—idols. Spiritual failure of this kind is deep and deadly. It cannot be uprooted merely by providing more information.

The Bible is not a book that merely provides some kind of religious philosophy. It is a book from God himself, a book that tells a story of how man rebelled against his Creator, and how God has undertaken a rescue by sending Christ the only Son of God into the world, to live, to die, and to rise again in order to bring about the rescue of people lost in the darkness of suppressing the truth. It is through the good news of what Christ has done that we are saved. And that news must be received by faith, which is itself a gift from God (Ephesians 2:8).

In modern thinking, “faith” often is taken to mean something like a leap in the dark. But Christian faith is not of this kind. It is faith responding to the light of who God is, of what He says, and of what He has done through Christ in space and time. Faith is a robust response to the truth. The difficulty is not that there is no available light or no available truth or too little evidence. There is plenty, but the human heart is dark and systematically makes substitutes that perpetuate the darkness. The real leap is on the part of those who are substituting an impersonal conception of law for the true God. This is a leap into the dark, because it is a leap against the evidence, by suppressing the evidence of what the law in fact is.

The Christian View of Science

Receiving the light through Christ leads naturally to more and more light. This receiving of light applies to our conception of science as well as everything else. If we stand in the light of God’s revelation of himself through Christ, we see the world lit up. Christians are not going to be thinking the same as non-Christians, and this holds true concerning the fundamental issue of the very nature of science. Of course, it is possible to discuss with non-Christians details about human genetics or about the big bang or about the fine-tuning of fundamental physical constants or about the origin of genetic information. But in the background there is always a more fundamental issue: are you committed to living by the light of God’s revelation, or committed to suppressing it?

And if your commitment is one way or the other, it shifts the entire edifice of the conception of science, not just the evaluation of details. Richard Lewontin was right in his fear: “We cannot allow a Divine Foot in the door.”⁸ The divine presence will take over the whole house, and leave people with nowhere to practice their would-be autonomy. The presence of

⁸ Richard C. Lewontin, “Billions and Billions of Demons,” review of *The Demon-Haunted World: Science as a Candle in the Dark*, by Carl Sagan, in *New York Review of Books*, January 9, 1997, [http://www.drjbloom.com/Public files/Lewontin_Review.htm](http://www.drjbloom.com/Public_files/Lewontin_Review.htm) (accessed December 14, 2013).

God transforms the very nature of science. In the presence of God, science exists to think God's thoughts after Him, and in the course of that thinking continually to praise Him.

Law as Trinitarian

The law is not only the very speech of God, but the speech of God in His Trinitarian character. We can see this by following a number of verses in the Bible. The original speech of God is identical with God, as indicated in John 1:1–3:

In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things were made through him, and without him was not any thing made that was made (ESV).

This eternal Word of God, who always was (“In the beginning”), is then identified as the same person who became flesh: “And the Word became flesh and dwelt among us” (John 1:14, ESV). The Bible as a whole, and the Gospel of John in particular, indicate that there is one God who eternally exists in three Persons, the Father, the Son, and the Holy Spirit. The Son is also called the Word. God the Father speaks eternally, and His speech is the Word. This eternal speech is the background and ultimate origin for the particular words that He speaks in order to bring the world into existence. John 1:1–3 has allusions to Genesis 1, where God uses speech to bring things into existence: “And God said, ‘Let there be light,’ and there was light” (Genesis 1:3, ESV).

The speech of God creating the universe reflects the more ultimate, eternal speech among the Persons of the Trinity. Creation takes place through the speaking of the Father through the Son, against the background of the fact that the Son is from all eternity the Word. The Holy Spirit is also present as one likened to the “breath” of God. We can see this through Ezekiel 37, which makes an explicit analogy between the Holy Spirit and “breath,” and does so in the context of re-creation—new life from the dead.

We conclude that the “laws of nature” are the Trinitarian speech of God, according to the plan of God the Father, in the speech constituted by God the Son, by the power and breath of the Holy Spirit. That should evoke our praise, for those who engage in science and for those who admire their work.