

Redeeming Mathematics

A God-Centered Approach

Vern S. Poythress

"*Redeeming Mathematics* is a valuable addition the growing literature on the relationship between mathematics and Christian belief. Poythress's treatment of three distinct dimensions of mathematics—as transcendent abstract truths, as part of the physical world, and as comprehensible to human beings—is a unique and helpful addition to the conversation on this relationship. The book is accessible to nonspecialists, but even those who are well-versed in these matters will find much to interest and challenge them."

James Bradley, Professor Emeritus of Mathematics, Calvin College; author, Mathematics Through the Eyes of Faith; Editor, Journal of the Association of Christians in the Mathematical Sciences

Redeeming Mathematics

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Redeeming Mathematics

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Introduction

Why God?

Does God have anything to do with mathematics? Many people have never considered the question. It seems to them that the truths of mathematics are just "out there."¹ In their view, mathematics presents us with a world remote from religious questions. Some people think that God exists; others are convinced that he does not; still others would say that they do not know. But all of them might say, "It does not matter when we look at mathematics."

I think it *does* matter. In this book I intend to show why. I am working from the conviction that we should honor and glorify God in all of life: "So, whether you eat or drink, or whatever you do, do all to the glory of God" (1 Cor. 10:31). The expression "whatever you do" includes our *thinking*, and our thinking includes our thinking about mathematics. In addition, I am a follower of Christ, and I acknowledge that Christ is Lord of all.² If he is Lord of all, he is also Lord of mathematics. But what does that mean? We will try to work out the implications.

I am writing primarily to people who follow Christ, who have come to know him as the living Savior and who have put their faith in him. They find out from the Bible that Christ himself teaches that the Old Testament

¹Other people think that arithmetic truths are "in here," that is, that they are items of mental furniture. We certainly do have mental concepts concerning mathematics. But, as we shall see later, mathematics ought not to be reduced to this pole of subjective experience.

²I have been encouraged here by Abraham Kuyper, who challenged people to think about the universal lordship of Christ in *Lectures on Calvinism: Six Lectures Delivered at Princeton University under Auspices of the L. P. Stone Foundation* (Grand Rapids, MI: Eerdmans, 1931). See Vern S. Poythress, *Redeeming Philosophy: A God-Centered Approach to the Big Questions* (Wheaton, IL: Crossway, 2014), appendix A.

is the word of God, God's own speech to us in written form (see especially Matt. 5:17–18; 19:4–5; John 10:35). The Old Testament predicts the coming of Christ (see, for example, Isa. 9:6–7; 11:1–5; 53:1–12; Mic. 5:2). It also makes provision for later prophets (Deut. 18:15–22). After Christ completed his work on earth, the New Testament was written with the same authority as the Old Testament. So I am going to draw on the Bible for understanding who God is, and in addition for understanding what mathematics is.³

If you are not yet a follower of Christ, you are still welcome to read. I hope it will be informative for you to learn what are the implications of the Bible for mathematics. But if you are going to appropriate the truth for yourself, you will first of all have to come to terms with Christ. You should ask who he is and what he has to say about you and the way you live your life. I would recommend that you start by reading the part of the Bible consisting in the Gospels (Matthew, Mark, Luke, and John).

³For extended discussion of the nature of the Bible, many books are available. See especially John M. Frame, *The Doctrine of the Word of God* (Phillipsburg, NJ: Presbyterian & Reformed, 2010). For a discussion of the broader set of commitments with which to study the Bible, see Poythress, *Redeeming Philosophy*; and Vern S. Poythress, *Inerrancy and Worldview: Answering Modern Challenges to the Bible* (Wheaton, IL: Crossway, 2012).

Part I

Basic Questions

1

God and Mathematics

Let us begin with numbers. We can consider a particular case: 2 + 2 = 4. That is true. It was true yesterday. And it always will be true. It is true everywhere in the universe. We do not have to travel out to distant galaxies to check it. Why not? We just know. Why do we have this conviction? Is it not strange? What is it about 2 + 2 = 4 that results in this conviction about its universal truth?¹

All Times and All Places

2 + 2 = 4 is true at all times and at all places.² We have classic terms to describe this situation: the truth is omnipresent (present at all places) and eternal (there at all times). The truth 2 + 2 = 4 has these two characteristics or *attributes* that are classically attributed to God. So is God in our picture, already at this point? We will see.

Technically, God's eternity is usually conceived of as being "above" or "beyond" time. But words like "above" and "beyond" are metaphorical and point to mysteries. There is, in fact, an analogous mystery with respect to 2 + 2 = 4. If 2 + 2 = 4 is universally true, is it not in some sense "beyond" the particularities of any one place or time?

Moreover, the Bible indicates that God is not only "above" time in the

¹Some relativists and multiculturalists might claim that even the truth of 2 + 2 = 4 is "relative" to culture. But in their practical living they show that they are confident about such truths.

² The subsequent analysis of the truth borrows ideas and wording from Vern S. Poythress, *Redeeming Science:* A God-Centered Approach (Wheaton, IL: Crossway, 2006), chapters 1 and 14.

sense of not being subject to the limitations of finite creaturely experience of time, but is "in" time in the sense of acting in time and interacting with his creatures.³ Similarly, 2 + 2 = 4 is "above" time in its universality, but "in" time through its applicability to each particular situation. Two apples plus two more apples is four apples.

Divine Attributes of Arithmetical Truth

The attributes of omnipresence and eternity are only the beginning. On close examination, other divine attributes seem to belong to arithmetical truths.

Consider. If 2 + 2 = 4 holds for all times, we are presupposing that it is the *same* truth through all times. The truth does not change with time. It is immutable.

Next, 2 + 2 = 4 is at bottom ideational in character. We do not literally see the truth 2 + 2 = 4, but only particular instances to which it applies: two apples plus two apples. The truth that 2 + 2 = 4 is essentially immaterial and invisible, but is known through manifestations. Likewise, God is essentially immaterial and invisible, but is known through his acts in the world.

Next, we have already observed that 2 + 2 = 4 is true. Truthfulness is also an attribute of God.

The Power of Arithmetical Truth

Next, consider the attribute of power. Mathematicians make their formulations to describe properties of numbers. The properties are there before the mathematicians make their formulations. The human mathematical formulation follows the facts and is dependent on them. An arithmetical truth or regularity must hold for a whole series of cases. The mathematician cannot force the issue by inventing a new property, say that 2 + 2 = 5, and then forcing the universe to conform to his formulation. (Of course, the written symbols such as 4 and 5 that denote the numbers could have been chosen differently. And a mathematician can define a

³John M. Frame, *The Doctrine of God* (Phillipsburg, NJ: Presbyterian & Reformed, 2002), 543–575.

new abstract object to have properties that he chooses. But we do not "choose" the properties of natural numbers.) Natural numbers conform to arithmetical properties and laws that are already there, laws that are discovered rather than invented. The laws must already be there. 2 + 2 = 4 must actually hold. It must "have teeth." If it is truly universal, it is not violated. Two apples and two apples always make four apples. No event escapes the "hold" or dominion of arithmetical laws. The power of these laws is absolute, in fact, infinite. In classical language, the law is omnipotent ("all powerful").

2 + 2 = 4 is both transcendent and immanent. It transcends the creatures of the world by exercising power over them, conforming them to its dictates. It is immanent in that it touches and holds in its dominion even the smallest bits of this world.⁴ 2 + 2 = 4 transcends the galactic clusters and is immanently present in the behavior of the electrons surrounding a beryllium nucleus. Transcendence and immanence are characteristics of God.

The Personal Character of Law

Many agnostics and atheists by this time will be looking for a way of escape. It seems that the key concept of arithmetical truth is beginning to look suspiciously like the biblical idea of God. The most obvious escape, and the one that has rescued many from spiritual discomfort, is to deny that arithmetical truth is personal. It is just there as an impersonal something.

Throughout the ages people have tried such routes. They have constructed idols, substitutes for God. In ancient times, the idols often had the form of statues representing a god—Poseidon, the god of the sea, or Mars, the god of war. Nowadays in the Western world we are more sophisticated. Idols now take the form of mental constructions of a god or a God-substitute. Money and pleasure can become idols. So can "humanity" or "nature" when it receives a person's ultimate allegiance. "Scientific

⁴On the biblical view of transcendence and immanence, see John M. Frame, *The Doctrine of the Knowledge of God* (Phillipsburg, NJ: Presbyterian & Reformed, 1987), especially 13–15; and Frame, *Doctrine of God*, especially 107–115. On the relationship to cosmonomic philosophy, see Poythress, *Redeeming Philosophy*, appendix A.

law," when it is viewed as impersonal, becomes another God-substitute. Arithmetical truth, as a particular kind of scientific law, is also viewed as impersonal. In both ancient times and today, idols conform to the imagination of the one who makes them. Idols have enough similarities to the true God to be plausible, but differ so as to allow us comfort and the satisfaction of manipulating the substitutes that we construct.

In fact, however, a close look at 2 + 2 = 4 shows that this escape route is not really plausible. Law implies a law-giver. Someone must think the law and enforce it, if it is to be effective. But if some people resist this direct move to personality, we may move more indirectly.

Scientists and mathematicians in practice believe passionately in the rationality of scientific laws and arithmetical laws. We are not dealing with something totally irrational, unaccountable, and unanalyzable, but with lawfulness that in some sense is accessible to human understanding. Rationality is a sine qua non for scientific law. But, as we know, rationality belongs to persons, not to rocks, trees, and subpersonal creatures. If the law is rational, as mathematicians assume it is, then it is also personal.

Scientists and mathematicians also assume that laws can be articulated, expressed, communicated, and understood through human language. Mathematical work includes not only rational thought but symbolic communication. Now, the original law, the law 2 + 2 = 4 that is "out there," is not known to be written or uttered in a human language. But it must be expressible in language in our secondary description. It must be translatable into not only one but many human languages. We may explain the meaning of the symbols and the significance and application of 2 + 2 = 4 through clauses, phrases, explanatory paragraphs, and contextual explanations in human language.

Arithmetical laws are clearly like human utterances in their ability to be grammatically articulated, paraphrased, translated, and illustrated.⁵ Law is utterance-like, language-like. And the complexity of utterances that we find among mathematicians, as well as among human beings in general, is not duplicated in the animal world.⁶ Language is one of the

⁵Vern S. Poythress, "Tagmemic Analysis of Elementary Algebra," Semiotica 17/2 (1976): 131–151.

⁶Animal calls and signals do mimic certain limited aspects of human language. And chimpanzees can be taught to respond to symbols with meaning. But this is still a long way from the complex grammar and mean-

defining characteristics that separates man from animals. Language, like rationality, belongs to persons. It follows that arithmetical laws are in essence personal.⁷

The Incomprehensibility of Law

In addition, law is both knowable and incomprehensible in the theological sense. That is, we know arithmetical truths, but in the midst of this knowledge there remain unfathomed depths and unanswered questions about the very areas where we know the most. Why does 2 + 2 = 4 hold everywhere?

The knowability of laws is closely related to their rationality and their immanence, displayed in the accessibility of effects. We experience in-comprehensibility in the fact that the increase of mathematical understanding only leads to ever deeper questions: "How can this be?" and "Why this law rather than many other ways that the human mind can imagine?" The profundity and mystery in mathematical discoveries can only produce awe—yes, worship—if we have not blunted our perception with hubris (Isa. 6:9–10).

Are We Divinizing Nature?

But now we must consider an objection. By claiming that arithmetical laws have divine attributes, are we divinizing nature? That is, are we taking something out of the created world and falsely claiming that it is divine? Are not arithmetical laws a part of the created world? Should we not classify them as creature rather than Creator?⁸

I suspect that the specificity of arithmetical laws, their obvious

ing of human language. See, e.g., Stephen R. Anderson, *Doctor Dolittle's Delusion: Animals and the Uniqueness of Human Language* (New Haven, CT: Yale University Press, 2004).

⁷ In their ability to undergo transformation and reformulation, scientific laws also show an analogy with the ability of human language to represent multiple perspectives. For more on the language-like character of scientific law and mathematics, see Vern S. Poythress, "Science as Allegory," *Journal of the American Scientific Affiliation* 35/2 (1983): 65–71, http://www.frame-poythress.org/science-as-allegory/, accessed June 18, 2014; Vern S. Poythress, "Newton's Laws as Allegory," *Journal of the American Sci-(1983)*: 156–161, http://www.frame-poythress.org/newtons-laws-as-allegory/, accessed June 18, 2014; Vern S. Poythress, "Mathematics as Rhyme," *Journal of the American Scientific Affiliation* 35/4 (1983): 196–203, http:// www.frame-poythress.org/mathematics-as-rhyme/, accessed June 18, 2014.

⁸ In conformity with the Bible (especially Genesis 1), we maintain that God and the created world are distinct. God is not to be identified with the creation or any part of it, nor is the creation a "part" of God. The Bible repudiates all forms of pantheism and panentheism.

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reference to the created world, has become the occasion for many of us to infer that these laws are a part of the created world. But such an inference is clearly invalid. The speech describing a butterfly is not itself a butterfly or a part of a butterfly. Speech referring to the created world is not necessarily an ontological part of the world to which it refers.

The Bible indicates that God rules the world through his speech.⁹ He speaks, and it is done:

By the *word* of the LORD the heavens were made, and by the *breath of his mouth* all their host. (Ps. 33:6)For he *spoke*, and it came to be; he *commanded*, and it stood firm. (Ps. 33:9)

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

God also continually sustains the world by his word: "he upholds the universe by the *word* of his power" (Heb. 1:3). God's word has divine wisdom, power, truth, and holiness. It has *divine* attributes, because it expresses God's own character. God expresses rather than undermines his own deity when he speaks words that address the created world.

We may then conclude that the same principle applies in particular to numerical truths about the world. God governs *everything*, including numerical truth. His word specifies what is true. The apples in a group of four apples are created things. What God says about them is divine. In other words, his word specifies that 2 + 2 = 4.

The key idea that the law for the world is divine is even older than the rise of Christianity. Even before the coming of Christ people noticed profound regularity in the government of the world and wrestled with the meaning of this regularity. Both the Greeks (especially the Stoics) and the Jews (especially Philo) developed speculations about the logos, the divine "word" or "reason" behind what is observed.¹⁰ In addition the Jews had the Old Testament, which reveals the role of the word of God in creation and providence. Against this background John 1:1 proclaims, "In

⁹See the discussion in Poythress, *Redeeming Science*, chapter 1.

¹⁰ See R. B. Edwards, "Word," in Geoffrey W. Bromiley et al., eds., *The International Standard Bible Encyclopedia*, 4 vols. (Grand Rapids, MI: Eerdmans, 1988), 4:1103–1107, and the associated literature.

the beginning was the Word, and the Word was with God, and the Word was God." John responds to the speculations of his time with a striking revelation: that the Word (logos) that created and sustains the universe is not only a divine person "with God," but the very One who became incarnate: "the Word became flesh" (1:14).

God said, "Let there be light" (Gen. 1:3). He referred to light as a part of the created world. But precisely in this reference, his word has divine power to bring creation into being. The effect in creation took place at a particular time. But the plan for creation, as exhibited in God's word, is eternal. Likewise, God's speech to us in the Bible refers to various parts of the created world, but the speech (in distinction to the things to which it refers) is divine in power, authority, majesty, righteousness, eternity, and truth.¹¹

The analogy with the incarnation should give us our clue. The second person of the Trinity, the eternal Word of God, became man in the incarnation but did not therefore cease to be God. Likewise, when God speaks and says what is to be the case in this world, his words do not cease to have the divine power and unchangeability that belong to him. Rather, they remain divine and in addition have the power to specify the situation with respect to creaturely affairs. God's word remains divine when it becomes law, a specific directive with respect to this created world. In particular, 2 + 2 = 4 remains a divinely ordained truth when it becomes a specific directive with respect to four apples on the kitchen table.

The Goodness of Law

Is 2 + 2 = 4 morally good? An arithmetical truth is not directly a moral precept. But indirectly it requires us to conform to it. We have an ethical constraint to believe the truth, once we have become convinced of it. We can also say that in a wider sense it is "good" for the universe and for us that 2 + 2 = 4. It never lies. We would not be able to live, nor would the universe hold together, without the consistency of arithmetical truths.

¹¹ On the divine character of God's word, see Vern S. Poythress, *God-Centered Biblical Interpretation* (Phillipsburg, NJ: Presbyterian & Reformed, 1999), 32–36.

The Beauty of Law

Is 2 + 2 = 4 beautiful? I think so. But not everyone is good at seeing the beauty in mathematics. I think there is beauty in the simplicity of 2 + 2 = 4. It is in harmony with the world. It is beautiful that its truth is displayed repeatedly, in four apples, four pencils, and four chairs. It is beautiful in its harmony with other arithmetical truths, with which it can be combined.

The beauty in arithmetic shows the beauty of God himself. Though beauty has not been a favorite topic in classical expositions of the doctrine of God, the Bible shows us a God who is profoundly beautiful. He manifests himself in beauty in the design of the tabernacle, the poetry of the Psalms, and the elegance of Christ's parables, as well as the moral beauty of the life of Christ.

The beauty of God himself is reflected in what he has made. We are accustomed to seeing beauty in particular objects within creation, such as a butterfly or a lofty mountain or a flower-covered meadow. But beauty is also displayed in the simple, elegant form of some of the most basic physical laws, like Newton's law for force, F = ma, or Einstein's formula relating mass and energy, $E = mc^2$. The same goes for the simple beauties in arithmetic and the more profound beauties that mathematicians discover in advanced mathematics.

The Rectitude of 2 + 2 = 4

Another attribute of God is righteousness. God's righteousness is displayed preeminently in the moral law and in the moral rectitude of his judgments, that is, his rewards and punishments based on moral law. Does God's rectitude appear in mathematics? The traces are somewhat less obvious, but still present. People could try to disobey arithmetical laws, for example, when they are trying to balance their checkbook. If they do, they may suffer for it. There is a kind of built-in righteousness in the way in which arithmetical laws lead to consequences.

In addition, the rectitude of God is closely related to the fitness of his acts. It fits the character of who God is that we should worship him alone (Ex. 20:3). It fits the character of human beings made in the image of God

that they should imitate God by keeping the Sabbath (vv. 8–11). Human actions fitly correspond to the actions of God.

In addition, punishments must be fitting. Death is the fitting or matching penalty for murder (Gen. 9:6). "As you have done, it shall be done to you; your deeds shall return on your own head" (Obadiah 15). The punishment fits the crime. There is a symmetrical match between the nature of the crime and the punishment that fits it.¹² In the arena of arithmetical law we do not deal with crimes and punishments. But rectitude expresses itself in symmetries, in orderliness, in a "fittingness" to the character of arithmetic. This "fitness" is perhaps closely related to beauty. God's attributes are involved in one another and imply one another, so beauty and righteousness are closely related. It is the same with the area of arithmetical law. Arithmetical laws are both beautiful and "fitting," demonstrating rectitude.

Law as Trinitarian

Does 2 + 2 = 4 specifically reflect the Trinitarian character of God? Philosophers have sometimes maintained that one can infer the existence of God, but not the Trinitarian character of God, on the basis of the world around us. Romans 1:18–21 indicates that unbelievers know God, but how much do they know? I am not addressing this difficult question, but rather reflecting on what we can discern about the world once we have absorbed biblical teaching about God.

God has specified by his word that 2 + 2 = 4. Thus, in its origin the truth that 2 + 2 = 4 is a form of the word of God. Hence, it reflects the Trinitarian statement in John 1:1, which identifies the second person of the Trinity as the eternal Word. In John, God the Father is the speaker of the Word, and God the Son is the Word who is spoken. John 1 does not explicitly mention the Holy Spirit. But earlier Scriptures associate the Spirit with the "breath" of God that carries the word out.

"By the word of the LORD the heavens were made, and by the *breath* of *his mouth* all their host" (Ps. 33:6). The Hebrew word here for breath is

¹² See the extended discussion of just punishment in Vern S. Poythress, *The Shadow of Christ in the Law of Moses* (Phillipsburg, NJ: Presbyterian & Reformed, 1995), 119–249.

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ruach, the same word that is regularly used for the Holy Spirit. Indeed, the designation of the third person of the Trinity as "Spirit" (Hebrew *ruach*) already suggests the association that becomes more explicit in Psalm 33:6. Similarly, Ezekiel 37 evokes three different meanings of the Hebrew word *ruach*, namely "breath" (vv. 5, 10), "winds" (v. 9), and "Spirit" (v. 14). The vision in Ezekiel 37 clearly represents the Holy Spirit as the breath of God coming into human beings to give them life. Thus all three persons of the Trinity are present in distinct ways when God speaks his Word. The three persons are therefore all present in God's speech specifying that 2 + 2 = 4.

We can come at the issue another way. Dorothy Sayers acutely observes that the experience of a human author writing a book contains profound analogies to the Trinitarian character of God.13 An author's act of creation in writing imitates the action of God in creating the world. God creates according to his Trinitarian nature. A human author creates with an Idea, Energy, and Power, corresponding mysteriously to the involvement of the three persons in creation. Without tracing Sayers's reflections in detail, we may observe that the act of God in creation does involve all three persons. God the Father is the originator. God the Son, as the eternal Word (John 1:1–3), is involved in the words of command that issue from God ("Let there be light"; Gen. 1:3). God the Spirit hovers over the waters (v. 2). Psalm 104:30 says that "when you send forth your Spirit, they [animals] are created." Moreover, the creation of Adam involves an inbreathing by God that alludes to the presence of the Spirit (Gen. 2:7). Though the relation among the persons of the Trinity is deeply mysterious, and though all persons are involved in all the actions of God toward the world, one can distinguish different aspects of action belonging preeminently to the different persons.

2 + 2 = 4 stems from the activity of God, the "Author" of creation. The activity of all three persons is therefore implicit in the very nature of the truth 2 + 2 = 4. First, 2 + 2 = 4 involves a rationality that implies the coherence of thought. This corresponds to Sayers's term "Idea," representing the plan of the Father. Second, in its application to the world, 2 + 2 =4 involves an articulation, a specification, an expression of the plan, with

¹³ Dorothy Sayers, The Mind of the Maker (New York: Harcourt, Brace, 1941), especially 33-46.

respect to all the particulars of a world. This specification corresponds to Sayers's term "Energy" or "Activity," representing the Word, who is the expression of the Father. Third, the expression of the truth that 2 + 2 = 4 involves holding created things responsible to its truth: it involves a concrete application to creatures, bringing them to respond to the law as willed by the Father. This corresponds to Sayers's term "Power," representing the Spirit.¹⁴

God Showing Himself

These relations are suggestive, but we need not develop the thinking further at this point. It suffices to observe that, in reality, the word specifying that 2 + 2 = 4 is divine. We are speaking of God himself and his revelation of himself through his governance of the world. People working with mathematics rely on God's word in order to carry out their work. When we analyze what 2 + 2 = 4 really is, we find that arithmetic constantly confronts us with God himself, the Trinitarian God; we are constantly depending on who he is and what he does in conformity with his divine nature. In thinking about arithmetic, we are thinking God's thoughts after him.¹⁵

But Do People Who Calculate Believe?

But do people who work with numbers really believe all this? They do and they do not. The situation has already been described in the Bible:

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. (Rom. 1:19–20)

The heavens declare the glory of God, and the sky above proclaims his handiwork.

¹⁴ See also John Milbank, *The Word Made Strange: Theology, Language, Culture* (Oxford: Blackwell, 1997), on the Trinitarian roots of communication.

¹⁵See Poythress, God-Centered Biblical Interpretation, 31-50.

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Day to day pours out speech,

and night to night reveals knowledge. (Ps. 19:1-2)

They know God. They rely on him. But because this knowledge is morally and spiritually painful, they also suppress and distort it:

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. 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. (Rom. 1:21–23)

Modern people may no longer make idols in the form of physical images, but their very idea of arithmetical laws is an idolatrous twisting of their knowledge of God. They conceal from themselves the fact that the "law" is personal and that they are responsible to the Person.

Even in their rebellion, people continue to depend on God being there. They show in action that they continue to believe in God. Cornelius Van Til compares it to an incident he saw on a train, where a small girl sitting on her father's lap slapped him in the face.¹⁶ The rebel must depend on God, and must be "sitting on his lap," even to be able to engage in rebellion.

Do We Christians Believe?

The fault, I suspect, is not entirely on the side of unbelievers. The fault also occurs among Christians. Christians have sometimes adopted an unbiblical concept of God that moves him one step out of the way of our ordinary affairs. We ourselves may think of "scientific law" or "natural law" or mathematics as a kind of cosmic mechanism or impersonal clockwork that runs the world most of the time, while God is on vacation. God comes and acts only rarely through miracle. But this is not biblical. "You

¹⁶ Cornelius Van Til, "Transcendent Critique of Theoretical Thought" (Response by C. Van Til), in Jerusalem and Athens: Critical Discussions on the Theology and Apologetics of Cornelius Van Til, ed. E. R. Geehan (n.l.: Presbyterian & Reformed, 1971), 98. For rebels' dependence on God, see Cornelius Van Til, The Defense of the Faith, 2nd ed. (Philadelphia: Presbyterian & Reformed, 1963); and the exposition by John M. Frame, Apologetics to the Glory of God: An Introduction (Phillipsburg, NJ: Presbyterian & Reformed, 1994).

cause the grass to grow for the livestock" (Ps. 104:14). "He gives snow like wool" (Ps. 147:16). Let us not forget it. If we ourselves recovered a robust doctrine of God's involvement in daily caring for his world in detail, we would find ourselves in a much better position to dialogue with atheists who rely on that same care.

Principles for Witness

In order to use this situation as a starting point for witness, we need to bear in mind several principles.

First, the observation that God underlies the truth 2 + 2 = 4 does not have the same shape as the traditional theistic proofs—at least as they are often understood. We are not trying to lead people to come to know a God who is completely new to them. Rather, we show that they already know God as an aspect of their human experience. This places the focus not on intellectual debate but on being a full human being.¹⁷

Second, people deny God within the very same context in which they depend on him. The denial of God springs ultimately not from intellectual flaws or from failure to see all the way to the conclusion of a chain of syllogistic reasoning, but from spiritual failure. We are rebels against God, and we will not serve him. Consequently, we suffer under his wrath (Rom. 1:18), which has intellectual as well as spiritual and moral effects. Those who rebel against God are "fools," according to Romans 1:22.

Third, it is humiliating to intellectuals to be exposed as fools, and it is further humiliating, even psychologically unbearable, to be exposed as guilty of rebellion against the goodness of God. We can expect our hearers to fight with a tremendous outpouring of intellectual and spiritual energy against so unbearable an outcome.

Fourth, the gospel itself, with its message of forgiveness and reconciliation through Christ, offers the only remedy that can truly end this fight against God. But it brings with it the ultimate humiliation: that my restoration comes entirely from God, from outside me—in spite of, rather

¹⁷ Much valuable insight into the foundations of apologetics is to be found in the tradition of transcendental apologetics founded by Cornelius Van Til. See Van Til, *Defense of the Faith*; and Frame, *Apologetics to the Glory of God*.

than because of, my vaunted abilities. To climax it all, so wicked was I that it took the price of the death of the Son of God to accomplish my rescue.

Fifth, approaching people in this way constitutes spiritual warfare. Unbelievers and idolaters are captives to Satanic deceit (1 Cor. 10:20; Eph. 4:17–24; 2 Thess. 2:9–12; 2 Tim. 2:25–26; Rev. 12:9). They do not get free from Satan's captivity unless God gives them release (2 Tim. 2:25–26). We must pray to God and rely on God's power rather than the ingenuity of human argument and eloquence of persuasion (1 Cor. 2:1–5; 2 Cor. 10:3–5).

Sixth, we come into this encounter as fellow sinners. Christians too have become massively guilty by being captive to the idolatry in which scientific and arithmetical law is regarded as impersonal. Within this captivity we take for granted the benefits and beauties of science and mathematics for which we should be filled with gratitude and praise to God.

Does an approach to witnessing based on these principles work itself out differently from many of the approaches that attempt to address intellectuals? To me it appears so.

What does God have to do with mathematics? Everything.

In this book, Vern Poythress argues that the harmony of abstract mathematical truths, the physical world of things, and the personal world of our thinking depends on the existence of the Christian God. Poythress shows that these distinct "perspectives" on mathematics cohere because all three find their origin in God's consistent character and nature.

Whether it's simple addition and subtraction or more complex mathematical concepts such as set theory and the nature of infinity, this fascinating book lays a theistic foundation for all mathematical inquiry.

"This book is a valuable addition the growing literature on the relationship between mathematics and Christian belief. Poythress's treatment of three distinct dimensions of mathematics—as transcendent abstract truths, as part of the physical world, and as comprehensible to human beings—is a unique and helpful addition to the conversation on this relationship."

James Bradley, Professor Emeritus of Mathematics, Calvin College; author, Mathematics Through the Eyes of Faith

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APOLOGETICS