The Trinity as a Foundation For Mathematics

by

Jeffrey R. P. Gilmore

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I. Introduction

In construction, one needs a solid foundation to build a strong building. If the foundation is weak or rotten, it is likely the building will deteriorate and eventually topple over. Since Euclid first systemized geometry, mathematics has been seen as the foundation for many intellectual buildings. It became the benchmark of logic and deductive reasoning, and so many other disciplines attempted to model the rigor of mathematics. Though many are content to take the truth claims (e.g. 1 + 1 = 2) of mathematics for granted, these claims provoke an investigation into what the foundation for mathematics is itself. This is among the greatest philosophical mysteries. The vast majority of mathematicians in the last century have espoused varieties of non-theism in answering this question, but only the triune God of the Bible is a satisfactory foundation for mathematics.

II. Mathematics and Non-Theism

Before launching into an exposition of a Trinitarian philosophy of mathematics, it is appropriate that one examine the deficiencies of non-theistic mathematics. The role of non-theism in the mathematical crisis of recent history and an inability to provide a comprehensive account of mathematical phenomena render non-theism an invalid foundation for mathematics.

i. The Recent Crisis in Mathematics

The belief that God is uninvolved in mathematics is a relatively recent shift of opinion. Belief in a universe-creating God was predominant toward the end of the medieval period, when interest in science was revitalized. The wisdom of the classical age was uncovered and the classical idea of a mathematical order in nature was readily accepted by the thinkers of the day. They attributed this order in nature to the rational God who had created the world. The essential assumptions that there is consistency in the world expressible in mathematical relationships, and that experiments are repeatable became a basis for the scientific method. Scientists such as Johannes Kepler (1571-1630) were driven by a near-religious zeal to uncover the mathematical order in nature:

> "The Chief aim of all investigations of the external world should be to discover the rational order and harmony which has been imposed on it by God and which He revealed to us in the language of mathematics."[1]

This fascination with mathematical order in the universe was radically different from the prevailing Aristotelian worldview. Whereas the world through the eyes of Aristotle was made of qualities such as hardness, colour, and sound, people were now looking at the world in terms of mathematical relationships. Nicolaus Copernicus (1473-1543) achieved a decisive victory for this new worldview when he persuaded the world that the earth orbits the sun. Despite the most obvious evidence – that the *sun* rises and sets each day- his model of the solar system prevailed because it reduced the necessary number of epicycles from more than eighty to thirty-four. Aesthetics in mathematics began to hold more weight than what is plain to the observer.

As success with mathematics continued, mathematics came to be viewed as an authority of its own. Isaac Newton (1642-1727) was able to encompass both terrestrial and celestial motion in the same unified handful of equations. The expectation of a unified explanation for the universe followed from the belief that God had created it. The belief that mathematics *describes* the regular operation of things in the universe, however, is a short step away from the belief that mathematics *governs* the regular operation of things in the universe. Galileo Galilei (1564-1642) wrote that nature acts only through, "immutable laws which she never transgresses."[2] The mathematical relationships became codified as laws, and this left little room in the universe for God.[3] Instead of viewing the orderly world as the reflection of an orderly creator, these "laws" became the causal authority in the universe. God is replaced with mathematics as the sustainer.

Mathematics became the authority in human knowledge as well as physical causation. The axiomatic-deductive methods in mathematics were applied to all fields of study. Because of the certainty associated with mathematics, it was thought that all truth could be deduced the same way. This is a dramatic shift in thinking. Truth is no longer thought to come from *without* the human universe but from *within*. Epistemologically, man is now autonomous since he is able to unravel the mysteries of the universe unaided, and with certainty. God is replaced with mathematics and the human mind as the source of truth.

The development of non-Euclidean geometry[4] became the first of several crises for mathematicians. Since various geometries were emerging depending on

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[1] Quote of Johannes Kepler from Nancy R. Pearcey and Charles B. Thaxton, The Soul of Science. Wheaton: Crossway Books, 1994, p. 126.
[2] Quote of Galileo Galilei from Nancy R. Pearcey and Charles B. Thaxton, The Soul of Science. Wheaton: Crossway Books, 1994, p. 131.
[3] The distinction here is subtle, but mathematics is separated from mathematical relationships. Whereas the science of mathematics is as inalterable as the laws of logic themselves, mathematical relationships are relationships held together only by the sustaining power of God. Physical necessity isn't the same as mathematical necessity.
[4] Euclid's geometry was the revered model of mathematical thought because of its rigorous deduction from a few basic axioms. Euclid described these simple axioms as "self-evident" – a notion that went unchallenged for all but the fifth axiom. The fifth axiom was awkwardly worded and wasn't as self evident as the others. For centuries after Euclid, no one could find any reason to reject the fifth axiom, but assuming the fifth axiom enabled one to achieve incredible results in geometry. Girolamo Saccheri

one's interpretation of Euclid's fifth axiom, the pertinent question became: which geometry is the true geometry? As James Nickel notes, "If the mathematical context is kept in mind, there are no contradictions among these geometries."[5] To the worldview grounded on the certainty of Euclidean geometry, however, it was a critical blow. This brought to question the objectivity of mathematics, and the existence of absolute truth.

The development of set theory revealed paradoxes in mathematics. Georg Cantor (1845-1918) used the concept of actually infinite sets to introduce set theory, and it became a very powerful tool. Nonetheless, the paradoxes it introduced were problematic.[6] These paradoxes occur whenever a set refers to itself (e.g. the set of all sets), but Russell resolved the paradox by adding the condition that a proposition cannot refer to itself. His ideas received much opposition from other mathematicians[7] because of this and other strange results[8] in set theory. Perhaps most threatening about set theory was its reliance on something that couldn't be exhaustively grasped by the human mind (actual infinity). It militated against the idea that everything that is true is from *within* the realm of human understanding.

The response of many mathematicians was to develop axiomatic systems, however necessarily complex, capable of containing all of mathematics. Gottlob Frege (1848-1925), though largely unrecognized during his lifetime, made the

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(1667-1733) thought that if he assumed the fifth axiom was not true and came to a contradiction, the validity of Euclidean geometry would be beyond question. He never came to a contradiction but instead opened the door to non-Euclidean geometries.

[5]James Nickel, Mathematics: Is God Silent?. Vallecito: Ross House, 1990, p. 56.

[6] Perhaps the most famous of these, known as the barber's paradox, is credited to Bertrand Russell (1872–1970). Suppose a village barber shaves all the men who don't shave themselves. Does the barber shave himself? Whether or not the barber shaves himself, a contradiction is reached.

[7] Leopold Kronecker called Cantor a charlatan. Henri Poincaré said, "later generations will regard set theory as a disease from which one has recovered." See Morris Kline, Mathematics: The Loss of Certainty. NewYork: Oxford University Press, 1982, p. 199-202.

[8] In addition to the paradoxes are some odd results. The number of items (cardinality) in the set of natural number {1, 2, 3…} and the cardinality of the set of even numbers {2, 4, 6…} is the same. Cantor also argued for different levels of infinity, and even infinity kinds of infinity!

astounding declaration that all mathematical concepts could be defined in logical terms and all theorems could be deduced from the principles of logic.[9] The same idealism was shared by David Hilbert (1862-1943) who wrote that "The theory of proof… is capable of providing a solid basis for the foundations of mathematics."[10] The assumption behind these ideas is: for something (i.e. math) to be true it must be conceivable in the mind of man. This variation of "man is the measure of all things," was nothing like the outlook of mathematicians several centuries earlier.

Such hopes were decisively crushed when Kurt Gödel (1906-1978) demonstrated, using a number theoretic proof, that mathematics could not be reduced to or contained in a finite number of axioms. The pivotal part of Gödel's proof is the finite number of axioms. Systems conceivable in the human mind necessarily have only a finite number of axioms. If it is possible to have a large enough deductive system to encompass all of mathematics, then the system will necessarily have inconsistencies. On the other hand, if a system is consistent there will necessarily be mathematical truths outside that system. Hence, it is impossible to have a complete and consistent deductive system. As it turns out, not only is it impossible to encompass *all* of mathematics with a deductive system but it is also impossible to encompass *any* significant branch of mathematics with a deductive system.[11]

If mathematics cannot be proved true, then why should it be true? This is the occasion of despair in mathematics that has since been referred to as a crisis. The majority of mathematicians since then have no reason to believe mathematics is true, but continue to use it and study it. Reuben Hersh argues that the problem is not

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[9] Thomas Tymoczko, "Challenging Foundations," as found in Thomas Tymoczko, editor. New Directions in the Philosophy of Mathematics. USA: Birkhäuser Boston, Inc., 1986, p 3.
[10] David Hilbert, "On the Infinite," as found in Paul Benacerraf and Hilary Putnam, editors. Philosophy of Mathematics: Selected Readings. Englewood Cliffs: Prentice-Hall, 1964, p. 149-150

finding the right foundation but actually looking for a foundation: “We simply stop thinking about it. Just *do* it.”[12]

Modern mathematicians have wrongly concluded that because man cannot build it, there is no foundation. The foundation is not necessarily fundamentally non-existent. Gödel only demonstrates that mathematics cannot be founded on a finite number of axioms (and so be conceivable in its entirety to finite human beings). This suggests rather that the mathematics that is there finds its foundation beyond man, or from *without*. That so much of mathematics depends on infinity affirms as much. Herman Weyl once remarked that mathematics is the science of infinity. If anything can be said about infinity, it is the opposite of human rationality in regard to finiteness. It is curious that concepts pivoting on the infinite have been so vigorously resisted throughout history (e.g. real numbers, differentials, infinite lines, infinite sets, etc.). In retrospect, they are essential. At stake is man’s autonomy; the infinite threatens man’s autonomy because he can neither claim to derive it nor fully understand it. The majority of modern mathematicians would rather believe that math works for no reason than that it is true, unknowable exhaustively, and contingent on something beyond man.

History bears many lessons about mathematics. Because autonomous thought in mathematics led to crisis and an admittedly irrational foundation for it, a non-theistic approach is deficient. History suggests instead that the foundation for mathematics exists outside of human reason and experience.

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[11] This is the diagnosis of the non-theistic mathematician Morris Kline. See Morris Kline, Mathematical Thought from Ancient to Modern Times. New York: Oxford University Press, 1972, p.102.
[12] He actually wrote that. Reuben Hersh, “Some Proposals for Reviving the Philosophy of Mathematics,” as found in Thomas Tymoczko, editor. New Directions in the Philosophy of Mathematics. USA: Birkhäuser Boston, Inc., 1986, p 14.

ii. Unanswered Questions

In addition to the weight of the testimony of history, a non-theistic view of mathematics must bear the burden of being one that is not comprehensive either. Many of the deeper questions about mathematics and its relation to the world must be ignored. Few of the ideas basic to mathematics find a metaphysical foundation in non-theism, but they are used anyway. Several of these are examined below.

How is it that mathematics has any relation to the world? If one takes the *a priori* approach that mathematics comes from human reason, it is quite peculiar that it should have any relation to the world around us. Even so, involved deductions *do* match what one finds in experience. Morris Kline admits that "Indeed it is paradoxical that abstractions so remote from reality should achieve so much."[13] One may respond with an *a posteriori* answer that this is so because mathematics is initially taken from experience. Repeated instances of 1 + 1 = 2 in experience are then the basis for mathematical knowledge. Then the question becomes, how does one generalize from observation that 3 + 2 = 5? Generalization involves logical induction, which must be an *a priori* function of the mind. Vern Poythress said of this dilemma: "Once one has made the Cartesian separation of mind and matter, of *a priori* and *a posteriori*, one can never get them back together again."[14] Philosopher David Hume once threatened the naïve western worldview by raising the objection that an *a posteriori* approach doesn't provide certainty that any physical laws will hold in the future. Who is to restrain the same objection in the case of mathematics? The best one can do is to argue that repeated instances of 1 + 1 = 2 in experience make this prediction *probable* in the future. The fact that mathematics finds correlation in the world is a complete mystery.

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[13] Morris Kline, Mathematics: The Loss of Certainty. NewYork: Oxford University Press, 1982, p. 8.

Though the use of logic is essential in mathematics, non-theism fails to justify the use of it. Some believe with John Stuart Mill that logic is more general than other observed things because it has been tested and confirmed to a greater extent. This view, however, makes logic little more certain than anything else that changes in the world. This seems to contradict the manner in which mathematicians often use logic. If only one counterexample to a statement is found, it is considered not true. Enormous (groundless) faith is put into all the deductions of mathematics if logic is not always true. Instead of being used as a variable, logic is used as though it is an abstract, absolute, unchanging reality. But why? Non-theism offers no metaphysical basis for logic.

Other abstract mathematical ideas lack a metaphysical foundation in non-theism. The role of the concept of infinity in mathematics, mentioned above, is essential, and yet the experience of man with the infinite is uncommon to say the least. Is it observed or touched, or even comprehensible in the mind of man? Infinity is wholly alien to the human mind, and so it is something the non-theist must take for granted. The concept of number is a subtle but necessary concept as well. Why should the proposition 1 = 2 be false? Extreme monists may assert that this is indeed true if the universe is unity. This suggestion is thwarted by the appearance of metaphysical plurality in the universe. On the other hand, how can two numbers be related and have operations performed on them? There appears to be a golden strand tying numbers together- a basis for relating them or a metaphysical unity between them. This is a particular instance of a bigger question in metaphysics: on what basis is there unity and plurality in the universe?

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[14] Vern Poythress, "A Biblical View of Mathematics," as found in Gary North, editor. Foundations of Christian Scholarship. Vallecito: Ross House, 1976, p.169.

Though these sorts of questions may seem novel to people today, man has been wrestling with them for ages. Plato, the ancient Greek philosopher, realized that one needs to have absolutes or universals for any knowledge to be meaningful. The difficulty facing him, however, was the fact that he didn't know of any absolute reference point. Francis A. Shaeffer explains that although "…he knew the need, the need fell to the ground because his gods were not big enough to be the point of reference or place of residence for his absolutes, for his ideals."[15] Sometimes the Greek gods are controlling the Fates and sometimes the Fates are controlling the gods. These limited gods are evidently not big enough to provide absolutes. A tangible example of this need for absolutes is the question of whether the sun orbits the earth or the earth orbits the sun. From the reference point of the sun, the earth moves. From the reference point of the earth, the sun moves (and then from another reference point, they both move.) Both models are mathematically feasible and both appear true depending on one's perspective. To know what is true absolutely, one would have to step outside of the universe (beyond both reference points) and look from *without*. Likewise, to know anything absolutely one needs an absolute reference point.

Platonists then speculated about a realm of ideals where all moral, geometric, and numerical absolutes existed. The problem is that man is unable to know these ideals- he has no revelation and is in alienation from the "ideal world" (or "divine" if you like). Unless they could find some revelation of reason (they called this λογος in Greek), there would be no way to access the divine, and truth would remain elusive while the universe would be doomed to meaninglessness.

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[15] Francis A.Shaeffer, He Is There and He Is Not Silent. Wheaton: Tyndale, 1972, p. 12-13.

III. God and Mathematics

Exposing the deficiencies of non-theism in mathematics is not enough on its own. There must be something to take its place. The Triune God of the Bible is sufficient where non-theism is deficient and He provides a solid foundation for mathematics because He is from without, reveals logic, and reveals number.

i. From Without

The need for absolutes from *without* that the Platonists recognized is not a speculative realm of ideals. God exists outside of the limited sphere of human habitation, and He is the point of absolute reference. He is not limited to morality, but is the absolute reference point in mathematics and physics also. He knows whether the sun orbits the earth or the earth orbits the sun because he sees the universe from outside of the universe. It is because of the character of God's knowledge - His omniscience – that he is able to know anything and everything absolutely: "There is no creature hidden from His sight, but all things are open and laid bare to the eyes of Him with whom we have to do." (Hebrews 4:13) He is intimately knowledgeable of man: "Even before there is a word on my tongue, Behold, O Lord, Thou dost know it all," (Psalm 139:4) and of the universe: "Thus says the Lord, Who gives the sun for light by day, And the fixed order of the moon and the stars for light by night, Who stirs up the sea so that its waves roar." (Jeremiah 31:34) Further, His knowledge is infinite: "Great is our Lord, and abundant in strength; His understanding is infinite." (Psalm 147:5)

Real numbers, which are infinitely repeating rational numbers, are no longer a ridiculous and imaginary construct. God's knowledge is infinite, and so he knows the precise value of all real numbers. He knows Pi with absolute precision. He knows the set of all sets. He knows the transfinite numbers. God himself is infinite and is a metaphysical foundation for infinity. This has particular significance in relation to the axiomatization of mathematics. The program of axiomatization didn't work because man simply isn't big enough. God, however, is big enough. The objection of Gödel doesn't apply to the infinite (i.e. an infinite set of axioms); rather, it points to God who is able to contain mathematics consistently and completely because He is infinite.

If mathematics is as such, then something profound about the future of mathematics can be known. Because man cannot know God exhaustively, he can neither fully know mathematics. On the other hand, this should prove to be no detriment to mathematicians (as it was after Gödel's results were published), since mathematics is not anchored on man's knowledge but on God's.

ii. Logic Revealed

So far this is still not much better than the Platonic ideals. So far this god is from without, but man is still unable to know him and access the divine. Fortunately, God is not merely an idea or an agnostic being but He is the God of the Bible who has revealed Himself to man.

God reveals Himself clearly in several ways. All creation testifies of the grandeur, majesty, and divine character of God (Romans 1:19-20). God has also revealed himself through the prophets of old (2 Peter 1:20-1). God spoke directly to prophets to reveal to man truth about Himself and the universe. All of this, however, is eclipsed by the revelation in these last days of His Son Jesus Christ (Hebrews 1:1-2). Jesus Christ is not merely another prophet but is himself God (Hebrews 1:8). He is a son in the sense that he proceeds from the Father giving Him expression.[16] It is also in this sense that the words of John's gospel begin "In the beginning was the Word, and the Word was with God, and the Word was God."

It would have perplexed the ancient Greek readers to note that what is translated "Word," in English is λογος (Logos). As mentioned above, this word would have meant "divine revelation," and the Greeks believed that through this one could know the realm of ideals and truth. If they had apprehended Him as He says He is, they would have ended their long search for divine revelation having beheld with their eyes and hands the inaccessible divine. That the Word became flesh and dwelt among us (John 1:14) is the profound solution to man's epistemological dilemmas. The truth is not just far removed, but is made unalterably accessible to man in the Lord Jesus Christ.

Admittedly, the translation given above is simplistic. It has a whole host of meaning in the Greek world,[17] taking up as much as five and a half columns in a thorough Greek lexicon. According to Gordon Clark's analysis, it

> "…can fairly well be combined into the idea of thinking, or the expression of thought. The English cognate is Logic, the science of

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[16] Sufficient explanation of the relationship between Jesus Christ and God the Father is beyond the scope of this discussion. The present writer must refer the reader to the volumes of theology written on this, and to the Bible. See Philippians 2:5-11; Hebrews 1; Psalm 110:1; Acts 2; John 6; 15.

[17] It came to be a technical term for philosophy because of the work of Heraclitus around 500 B.C. He believed the world was in constant flux, but that there is an unchanging universal law called the Logos. Later, the Stoics (about 300 B.C.) believed that a spark of the divine Logos controls or even is each individual thing. These sparks, or *logoi*, seminal logoi, are thought of as seeds from which grow all that we see. The Stoics may have emphasized, that every man is a spark of divinity, but not to the exclusion of everything else in the world. This clearly pantheistic worldview cannot be exactly what the Apostle John has in mind. For example, the Logos he speaks of is a very unique manifestation whereas for the Stoics, it was incarnate in everything. To Plato, a *logos* was a verbal expression of thought. To Philo, the Jewish (Platonic?) philosopher in Alexandria at the time of Christ, the Logos was the realm of ideals in the mind of God that he called the Son of God. In addition the Gnostics and mystery religions in a variety of senses used the term. Clark concludes that "…the way [John] used it in the Prologue can,

> valid reasoning… Therefore, if one hesitates to translate the first verse as, "In the beginning was the divine Logic," at least one can say, "In the beginning was Wisdom.""[18]

If one would continue to translate the verse, it would read "…and the Logic was with God, and the Logic was God." This translation may seem obnoxious and offensive because, one might object, God is reduced to something impersonal. To call God "Logic", however, is no more impersonal than calling Him "Word." God is Logic, Logic is God, and Logic is a person.

Elsewhere it is written that God is light and in Him there is no darkness (1 John 1:5). With the intellect, irrationality is darkness and obscurity and misunderstanding whereas rationality is clear and light as a well-lit path. There is a parallel between spiritual light and intellectual light. Just as apart from God men are in spiritual darkness, apart from Him (Logic) they are in intellectual darkness as well. Just as logic is a way of coming to the correct conclusion or truth, the Logos is a way of coming to the truth about God. One might ask why those who have no interest in God are able to reason. It is because man (all humanity) is the image of God, with the faculties that distinguish man from the rest of creation including the ability to reason.[19] Man is never able to entirely renounce his maker.

The mathematician now has a reason to believe that mathematics is true and reliable. There is no problem with logic, but only the incorrect use of it. Because Jesus

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I believe, best be explained as a denial of pagan religions." See Gordon H. Clark, The Johannine Logos. Jefferson: The Trinity Foundation, 1989, p. 15-18.

[18] Ibid, p. 19.

[19] This is a type of *a priori* rationalism. "Man's mind is not initially a blank. It is structured. In fact, an unstructured blank is no mind at all. Nor could any such sheet of white paper extract any universal law of logic from finite experience. No universal and necessary proposition can be deduced from sensory observation. Universality and necessity can only be *a priori*." See Gordon H. Clark, "God and Logic," January 22, 2001, www.trinityfoundation.org.

Christ is the eternal and immutable God, logic is eternal and immutable. Norman L. Geisler and Ronald M. Brooks note the difference between logical law and natural law: “Natural law is really only a description of how things normally *do* operate; but laws of logic are more like ethical laws that tell us how our minds *should* operate, even if that is not the way we always think.”[20] 1 + 1 = 2 for both God and man. 1 + 1 = 2 in every part of the universe. 1 + 1 = 2 in the past, present, and future.

The philosopher Roy A. Clouser erroneously argues that logic and mathematics are not eternally existent but that God created them at creation.[21] God is sovereign over all the laws of the universe (Psalm 119:89-91 with Psalm 148:6) and they are his servants by which he rules (I would say they show that he rules) creation (Jeremiah 31:35, 36; 33:25; Job 38:33). It is also written that He is the creator of all things visible and invisible (Colossians 1:15,16). This is not convincing, though, because there are a lot of things invisible apart from logic. In fact, all the laws of physics are invisible and yet they are not logic. They depend on logic. To understand the word “all things,” exhaustively is to believe that God created morals too (which depend on His unchanging moral character) and even the Lord Jesus Christ. Further, if God at one time created logic, then He is not an essentially rational being which He is. The text Proverbs 8:22-31 is quoted in which wisdom is supposedly in everlasting creation, and hence God’s qualities aren’t necessarily uncreated. This unfortunately means both that wisdom, as a divine attribute, exists eternally, independent of God and that God’s attributes are created. A more common understanding of this passage

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[20] Norman L. Geisler and Ronald M. Brooks, Come, Let Us Reason. Grand Rapids: Baker House Books, 1990, p. 19.
[21] Roy A Clouser, The Myth of Religious Neutrality. Notre Dame, Indiana: U. of Notre Dame Press, 1991, p. 176 - 90.

is that wisdom here is a personification of the uncreated pre-incarnate Son of God,[22] which makes the point.

The revelation of the Logos has particular significance in mathematics. Foremostly, the use of logic is no longer taken for granted but it is grounded with certainty in the second person of the Godhead. In addition, since God is an eternally existent being, Logic always was and always will be.

iii. The Nature of Number

It is subtle, but without a foundation for number, there is no numerical aspect to mathematics. The disciples of Pythagoras (around 500 B.C.) understood the gravity of this necessity and theorized about a (pre-) Platonic realm where ideal numbers existed. Anything of numerical quality in the world was derivative of the numbers in this ideal realm. In fact they believed that number was the basic building block of the universe. Perhaps in some ways they were right. If number is in any way absolute and invariant, it must exist as part of God.

God is a unity. One of the verses most esteemed by ancient Israelites was, "Hear, O Israel! The Lord is our God, the Lord is one!" (Deuteronomy 6:4; see also John 17:3; 1 Corinthians 8:6) At the same time, but not in the same way, God is also a plurality. He is distinctly expressed in the Son (Mark 1:10-11), in the Holy Spirit (John 15:26), and in the Father (Hebrews 9:14). Since the triune God is eternally existent, the numbers one, two, and three are also eternally existent. By means of induction, the natural numbers and rational numbers are also eternally existent. By means of infinitely long fractions, real numbers too are eternally existent. The Triune God is a metaphysical foundation for number.

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[22] Matthew Henry, Mathew Henry's Commentary on the Whole Bible. Peabody: Hendrickson, 1992, p.

One might insist that the doctrine of the trinity teaches that 1 + 1 + 1 = 1, and hence that God's mathematics is different from that of man. Though this doctrine asserts that God is one and God is three, it doesn't teach that God is one and three in the same sense. God is one in regard to His essence, but He is three in the expression of His persons. There is nothing irrational about this, though it is beyond the scope of human comprehension in its fullness.

The ontological trinity (God in His being) is a basis for the unity and plurality in the universe. Why should two numbers have any relation to one another? Numbers can be combined with operations because the diverse persons of the Godhead are inseparably connected. Why is one number different than another? Any two persons of the Godhead are unique. Because of the triune God, no two snowflakes are alike and yet both are made of the same atomic building blocks. Because of the triune God, no two personalities are identical but all people are human. With the triune God there is variety and community, apart from Him there is monotony and alienation.

> "Since both the one and the many are equally ultimate in God, it immediately becomes apparent that these two seemingly contradictory aspects of being do not cancel one another but are equally basic to the ontological trinity, one God, three persons"[23]

The contention between *a priori* and *a posteriori* epistemologies is reconciled in God's unity and plurality. An extreme *a priori* epistemology is much like monism, reducing everything to the human mind. Similarly, in an extreme *a posteriori* epistemology one part has no basis for relation to another part. Anti-Trinitarian

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thought can find no reconciliation between these two and will inevitably go to one extreme or the other. But just as the irreconcilable man and God are brought together in the Lord Jesus Christ, *a posteriori* and *a priori* are reconciled in the Triune God. Man can understand the world because the same God who created and sustains it in an orderly and rational way, structured the mind of man to understand it.

The unity and plurality of the Creator is evident in mathematics and His creation. The Greek letter Π (Pi), representing the ratio in a circle of the circumference to the diameter, is found in trigonometry, the study of music, the geometry of a spherical raindrop, probability theory, the sum of an infinite series, etc. The inverse square law of gravitation has its parallels in light intensity, sound volume, and the forces of electricity and magnetism.[24] The same trigonometric functions derived geometrically (sine, cosine, tangent) can also be derived algebraically using sequences and series. All sciences involve mathematics, and yet none of them can be reduced to mathematics. This unity and plurality has no metaphysical foundation on earth: "No created thing is three and at the same time one in the same sublime way."[25] All unity and plurality in the universe is derivative of the ontological trinity.

If everything is derivative of the triune God, one might ask, to what extent does man create in mathematics? Man is able to create, and that this ability is derivative is no hindrance to man's creativity. This ability to create is first tested when God completes the work of creation and Adam names the animals (Genesis 2:20). Devising a suitable label for each animal required careful observation, analysis, and categorization, based on the way it was created. God did not prescribe one right

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[23] Rousas J. Rushdoony, <u>The One and the Many</u>. USA: Craig Press, 1971, p. 10.
[24] James Nickel, <u>Mathematics: Is God Silent?</u>. Vallecito: Ross House, 1990, p. 94.
[25] Vern Poythress, "A Biblical View of Mathematics," as found in Gary North, editor. <u>Foundations of Christian Scholarship</u>. Vallecito: Ross House, 1976, p.180.

name to describe an animal, but He left room for Adam to be creative.[26] When building mathematical models, finding solutions for differential equations, and improving numerical approximations, man is using his rational and creative faculties. God doesn't prescribe these methods, though doubtless they are not beyond His foresight. In the infiniteness of His understanding, he doesn't need mathematics as a tool though man in his finiteness does.

In pure mathematics, where truth about the very essential concepts of number is deduced, the nature of the discipline is different. Whereas the mathematics described above is concerned with improving techniques in order to solve problems, pure mathematics is more concerned with the truth about number and algebra itself. The truth about these things is necessarily discovered not created.

The unity and plurality of the Godhead is a basis both of number in mathematics, and the unity and plurality of mathematics and creation. Man employs his rational and creative faculties to devise solutions to problems and discover the truth about mathematics.

IV. Conclusion

Mathematics may be still regarded as a rock of certainty not because of the achievement of man, but because of the God it is built on. In Him there is a foundation for the infinite nature of mathematics, the use of logic, and the use of number. To have a strong building, one needs a sturdy foundation:

> "Therefore everyone who hears these words of Mine, and acts upon them, may be compared to a wise man, who built his house upon the

[26] Nancy R. Pearcey and Charles B. Thaxton, The Soul of Science. Wheaton: Crossway Books, 1994,

> rock. And the rain descended, and the floods came, and the winds blew, and burst against that house; and yet it did not fall, for it had been founded upon the rock…"

The mathematicians and scientists who first saw the universe in quantitative mathematical relationships did so because they believed the same Creator who made them also made the world with order and structure. Mathematicians who have rejected this foundation are able to understand and contribute to mathematics though they operate on borrowed capital. Non-theistic worldviews have nevertheless born their fruit in season - disillusionment and uncertainty about mathematics as a whole.

> "…And everyone who hears these words of Mine, and does not act upon them, will be like a foolish man, who built his house upon the sand. And the rain descended, and the floods came, and the winds blew, and burst against that house; and it fell, and great was its fall."(Matthew 7: 24-7)

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