

BIBLICAL CHRISTIAN INTERPRETATION OF MATHEMATICS

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INTRODUCTION (2026)

These notes formed the basis for a three-hour talk to the staff at Sunrise Christian School in Adelaide, South Australia, July 26, 1984. (Headmaster: Bev Norsworthy). It was from these notes that I eventually wrote *Mathematics: Is God Silent?*

I include these notes to show the state of my thinking in the mid-1980s, after several years of research. In the years since, I have refined my perspective through teaching, studying, and writing. The best demonstration of my current thinking is *Mathematics: Exploring Beauty—Trinitarian Perspectives* (2024).

Read these notes and then my most recent book and see if you can spot the refinements.

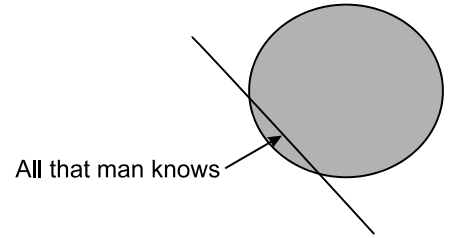
INTERPRETATION AND TRUTH

GODLESS APPROACH

1. Man acquires knowledge without reference to the God of all knowledge.
2. Presuppositional assumption: man is the origin and ground of truth.
3. Facts are interpreted in and of themselves either from a matter-centered perspective or a man-centered (rationalistic) perspective.

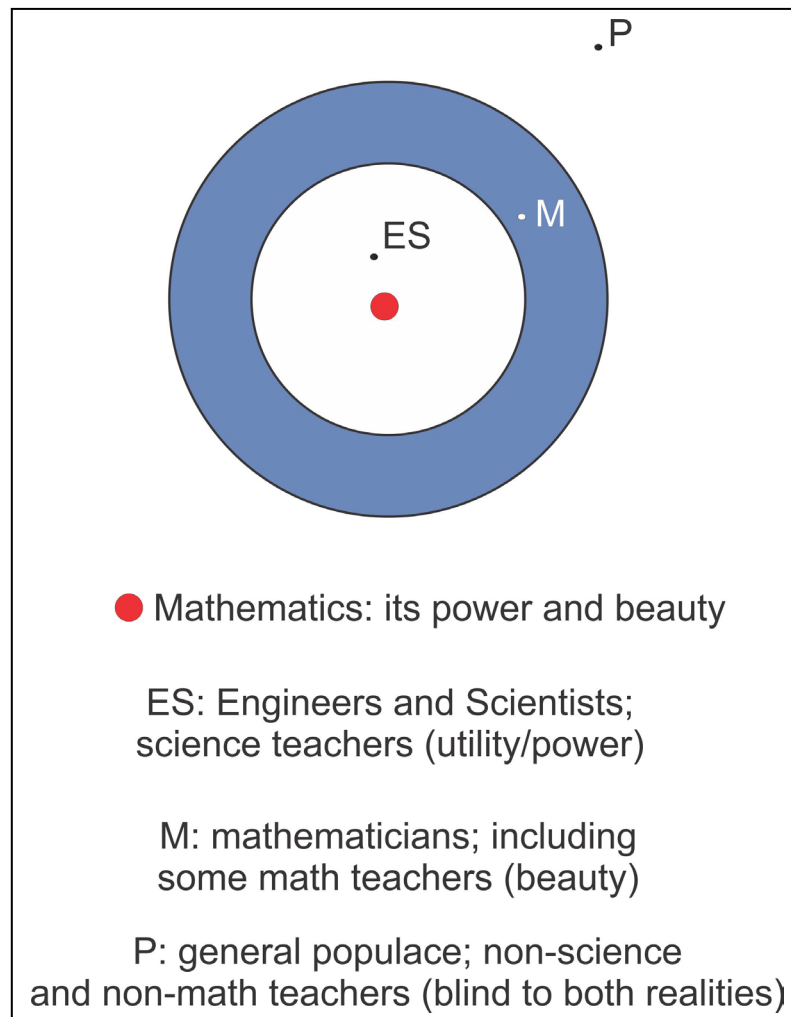
CHRISTIAN APPROACHES

1. Facts of the different subject disciplines are taught *plus* the Bible (as a separate subject).
 - a. The Bible and the subject disciplines are disconnected.
 - b. Instruction in the Bible connects *only* to the individual, the family, the church, and life hereafter.
 - c. Engenders the sacred/secular dichotomy.
2. The Bible is “tacked-on” in an attempt to “spiritualize” the “secular.”
 - a. Using a Scripture quotation to justify a mathematical topic.
 - b. “We must learn math for God’s glory.”
 - c. Engenders “artificial” connections and hypocrisy.
3. The Triune God is the ground of all knowledge.
 - a. God is the source of all Truth since He is Truth.
 - b. God is the source of rationality (wisdom, understanding, knowledge) since ultimate wisdom resides in Him.
 - i. There is only one rational order pervading the universe. It takes different forms ...
 1. Number rationality.
 2. Word rationality.
 3. Organismic (living beings) rationality.
 4. Aesthetic rationality.
 - ii. but all these forms are interlocked; they interpenetrate each other.
 - iii. Each has distinctive differences and basic unity, but all are under the constraint of the ultimate order of things.
 - c. God’s character, therefore, is revealed to us as we acquire knowledge of each discipline.
 - i. The fear of God is the beginning of wisdom (Proverbs 1:7).



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- ii. "... if we do not love God we shall forever be at the edge of truth. We may amass ten thousand pages of accurate technical data in experimental psychology but never come to know the true man made in the image of God. We may completely unravel the mystery of the atom but never know its great Creator. We may become experts in philosophy and know all the technicalities of knowledge but never know the supreme Subject of knowledge, the triune God. And to crown our stupidity we shall view the edge of truth as the center!" Bernard Ramm, *The Christian College in the Twentieth Century*, p. 27.
 - iii. In Thy light, we see light (Psalm 36:9).
 - iv. Christ is the light of men (John 1:4) \Rightarrow if man knows anything in truth, it is because of Christ.
- d. Mathematics, number and space, is a way to describe the patterned order, the rationality, of God's creation, a creation voiced into existence. Hence, by understanding mathematics Biblically, we can put a word to the equations that gives praise to the Creator and Sustainer of all things (e.g., the ethos of Kepler).



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HISTORICAL SURVEY

“For no man can lay a foundation other than the one which is laid, which is Jesus Christ”
(I Corinthians 3:11)

Christ is the ground of the rationality of the universe (John 1:1-4, Colossians 1:15-17)

<i>Philosophy</i>	<i>Mathematics</i>
POSTDILUVIAN CIVILIZATIONS	
<ul style="list-style-type: none"> Governed by anti-God presuppositions (Genesis 11) and nature worship. 	<ul style="list-style-type: none"> Priesthood kept many mathematical “secrets” in order to retain power. Egyptian mathematics: Pyramids, irrigation canal systems, granaries, tax collecting provided the applications for the development of algebra, geometry, and trigonometry. Babylonian mathematics: Base 60 positional number system, solution of quadratic equations.
HEBREW CULTURE	
<ul style="list-style-type: none"> Unitary (holistic) view. Creation out of nothing. Creation has a beginning. Creation distinct from Creator. <ol style="list-style-type: none"> Distinct but dependent. Creation has a nature of its own: independent. 	<ul style="list-style-type: none"> No developments in mathematics, but view of creation critical for its future development.
CLASSICAL GREECE (600 BC TO 300 BC)	
<ul style="list-style-type: none"> Anaxagoras, “Reason rules the world” (personal mind-centric). Pythagoras, “Number rules the universe” (impersonal number-centric). Plato, “Nature is the world soul ... god eternally geometrizes ... the knowledge at which geometry aims is the knowledge of the eternal.” Aristotle, “Nature is unchangeable, eternal, uncreated, self-generating, and ration ... nature creates.” 	<ul style="list-style-type: none"> Euclid’s <i>Elements</i> of Geometry confirmed the notion that deductive reasoning is <i>the</i> pathway to truth. Euclid’s work is an example of axiomatic-deductive approach (<i>a priori</i> absolutized) or pure mathematics <i>alone</i>. <ol style="list-style-type: none"> Existence statements: statements that refer to external facts independent of them. Coherence statements: statements that refer to other statements in a coherent series. The Axiomatic-deductive method used by

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<i>Philosophy</i>	<i>Mathematics</i>
<ul style="list-style-type: none"> • Cosmos: Eternal and Necessary. <ol style="list-style-type: none"> 1. By necessary, they meant that the things that are could <i>not</i> have been otherwise. 2. The Greeks understood the cosmos to be equivalent to mind and, thereby, assuming the <i>purity</i> of rational thinking, the “mind” of the cosmos and the “mind” of man are one.¹ 3. The structured forms of mathematics are thereby tied to the <i>necessary</i> way things are. 4. Since the physical world of matter is implanted with this <i>necessary</i> order and since <i>reason is the cosmos</i>, then man can <i>only</i> discover patterns by thinking <i>a priori</i>. 5. Necessity ⇔ rationalism. • Radical dualism: <ol style="list-style-type: none"> 1. <i>Thought</i> vs. experience. 2. <i>Intelligible</i> vs. sensible. 3. <i>Form</i> vs. matter. 4. <i>Eternal ideas</i> vs. empirical events. 5. <i>Appearance</i> vs. reality. 6. <i>a priori</i> vs. <i>a posteriori</i>. 7. <i>Eternal</i> vs. temporal. 8. In cosmology, different laws for Terrestrial and celestial Motion. 	<p>mathematicians since Euclid is concerned primarily with coherence statements.</p> <ol style="list-style-type: none"> 4. What is rational is what is necessary (<i>a priori</i>). 5. Irrationality = contingency (chance to the Greeks)
<h2>EARLY CHRISTIANITY (THE INCARNATION TO 500 AD)</h2>	
<ul style="list-style-type: none"> • Incarnation. <ol style="list-style-type: none"> 1. God became human, not only to redeem a people for His name, but to <i>sanctify</i> them, to sanctify every thought, to sanctify the cosmos, to sanctify every aspect of created reality. 2. A loving and interpersonal Triune God created and sustains all things through the Word now incarnated, the Word of Grace and Truth by which all men can participate in His circle of love. 3. Gave dignity and God’s stamp of approval 	<ul style="list-style-type: none"> • John Philoponus (490-570) challenged Aristotle’s theory of motion laying the philosophical groundwork for Galileo and Newton. • The battle with Neo-Platonism and later Aristotelianism (to some extent, Augustine(: comprised the work of Philoponus; it went underground. • Eventually, the view of creation embraced by the church fathers laid the groundwork for the only viable birth of modern science (and the

¹ In contrast, the Biblical Christian believes that the mind of man is neither pure nor untainted; it is fallen and thereby needs correction (Ephesians 4:17-24; Romans 12:1-2). Truth is the corrective factor. The ultimate source of truth is the person of God as revealed in Scripture. The proximate source of the truth is God’s creation where the nature of objective reality structures one’s thinking.

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<i>Philosophy</i>	<i>Mathematics</i>
<p>on the created realm.</p> <ul style="list-style-type: none"> • Early Church fathers (Nicene Creed). <ol style="list-style-type: none"> 1. Challenged and repudiated the dualistic thinking of the Greeks as they sought to gain clarification of the relational nature of God (Triune: One God, three persons), the nature of Christ (hypostatic union between God and man), and the nature of creation. 2. The Nature of Creation. <ol style="list-style-type: none"> a. The Rational Unity of the Universe (the dance of God). b. The Rationality or Intelligibility of the Universe is contingent. c. There is a contingent freedom of the Universe: requires <i>a posteriori</i> investigation. 3. Discounted the Greek idea of the “unreality” of the physical realm and showed, at the same time, that the rational forms of thought, so venerated by the Greeks as timeless and divine, were <i>created</i> forms of rationality with which the Creator and imprinted on the universe. • Boethius: Seven Liberal Arts (Greek heritage): <ol style="list-style-type: none"> 1. Trivium (Grammar, Rhetoric, Logic). 2. Quadrivium (Arithmetic, Geometry, Music, and Astronomy). • The battle: <ul style="list-style-type: none"> • A vibrant Christian faith could handle Greek scholarship without compromise. • A weakened faith will compromise. 	<p>development of modern mathematics with it).</p>
MIDDLE AGES (500 TO 1500)	
<ul style="list-style-type: none"> • Negative. <ol style="list-style-type: none"> 1. The rise of ecclesiastical absolutism (church-centered Christianity). 2. The battle: Submission of Scripture to Greek thought forms (both Plato and Aristotle) including stationary earth (Geocentrism) while Greek thought forms were resisted by some of the medieval scholastics. • Positive. 	<ul style="list-style-type: none"> • Key ideas developed: <ol style="list-style-type: none"> 1. Functions. 2. Symbolic Algebra. 3. Inertial theory of motion. 4. Coordinate geometry. 5. Trigonometry. 6. Infinitesimal.

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<i>Philosophy</i>	<i>Mathematics</i>
<ol style="list-style-type: none"> 1. Infused the great thinkers of the Renaissance and the Reformation with the belief that nature was the creation of the Biblical God and that God’s creation could be understood 2. High Middle Ages (from Grosseteste to Ockham): (1) relate theory to observation, (2) struggled with the problems of induction and experimental verification that arose through the application of geometric demonstration to the world of experience. 3. Mathematics flourishes in a culture that allows freedom of inquiry and encourages study of the real world (induction). 4. Morris Kline, “... willingness to think about ideas suggested by physical problems in an abstract form that makes no promise of immediate or practical return. Then paradoxically, a new insight into nature, a richer, broader, more powerful understanding, is achieved, which in turn generates deeper math activities” <i>(Mathematical Thought from Ancient to Modern Times, p. 205).</i> 5. Induction: “Nature is the matrix from which ideas are born.” 6. The doctrine of the knowledge of God is the matrix by which all things are to be interpreted. 	
<p>SCIENTIFIC REVOLUTION (1500 TO 1800)</p>	
<ul style="list-style-type: none"> • Positive: <ol style="list-style-type: none"> 1. Copernicus, “The hand of God is in the marvelous correlation between mathematical conclusions and the actions of nature. 2. Kepler, “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.” 3. Newton, “Everywhere in the universe is the evidence of God’s majestic design and of His 	<ul style="list-style-type: none"> • Key ideas developed: <ol style="list-style-type: none"> 1. Analytical Geometry united with Symbolic Algebra. 2. Calculus. 3. Newtonian mechanics. 4. Three laws of motion. 5. Universal Law of Gravitation: Terrestrial and Celestial motion unified.

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<i>Philosophy</i>	<i>Mathematics</i>
<p>constant and continuous concern to keep the universe running according to plan.”</p> <ol style="list-style-type: none"> 4. Leibniz, “There is a pre-established harmony between thought and reality ... Nature is the art of God ... It seems to be that the principle goal of the whole of mankind must be the knowledge and development of the wonders of God.” 5. Morris Kline, “The work of the 16th, 17th, and most 18th century mathematicians was a religious quest; the search for mathematical laws of nature was an act of devotion which would reveal the glory and grandeur of His handiwork ... they sought, for the most part, to do no more than to understand God’s marvelous design.” <ul style="list-style-type: none"> • Two key recognitions: <ol style="list-style-type: none"> 1. Each discovered law was hailed as an evidence of God’s infinite wisdom, not simply as the ingenuity of the investigator. 2. Since God’s thoughts are higher than man’s thoughts, man’s mathematics must be limited. • Negatives: <ol style="list-style-type: none"> 1. Newton still retained dualistic thinking in spite of his unification laws. 2. In Newton’s container model of the space-time framework, he conceptualized the physical universe as a huge bucket which serves as a receptacle in which all the energy-mass structures (material objects and events) that constitute being are poured. He understood space and matter dualistically; i.e., space and time had an absolute status independent of material existence while causally conditioning its character and qualities as an inertial system. 3. Newton could <i>not</i> embrace the reality of the Incarnation and embraced Arianism (Jesus is a created being). 4. Absolute and relative mathematics. 5. Universe became to be seen as closed and mechanical. 	

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<i>Philosophy</i>	<i>Mathematics</i>
<p>THE ENLIGHTENMENT AND EINSTEIN’S CORRECTIVE (1800 TO 1930)</p>	
<ul style="list-style-type: none"> • Descartes, “The universe is a mechanism whereby everything that is in it runs, not by divine intervention, but according to mathematical law ... the intellect by its own power may arrive at a perfect knowledge of all things.” • Laplace, speaking of God the Creator, “I have no need of this hypothesis.” • Mechanistic philosophy. <ol style="list-style-type: none"> 1. Supernatural out (in the form of Deism). 2. Nature absolutized. 3. Rigid determinism (logical causality). 4. Scientific knowledge is the sole gateway to truth in the whole realm of knowledge. 5. Never absolutize the relative or relativize the absolute. • Idolatry judged. <ol style="list-style-type: none"> 1. They soon discovered serious cracks and began to reconstruct the foundations using human reason alone. 2. This led to four divergent schools of thought, each with a starting point of man. • Gödel (1906-1978) dropped a bomb on these foundations in 1930. <ol style="list-style-type: none"> 1. “Mathematics is too big for the human mind ... the possible relationships about numbers are as unlimited as the parade of numbers itself.” 2. He declared that the reason of man is not sufficiently powerful to place mathematics on an indubitable foundation. 3. The ultimate source of truth in mathematics lies <i>outside</i> the system, outside of logic and reason. • Maxwell and Einstein. <ol style="list-style-type: none"> 1. Newtonian dualism dethroned by a return to unitary (Hebraic and Biblical) thinking. 2. In Einstein’s relational space-time framework, 	<ul style="list-style-type: none"> • Key ideas developed: <ol style="list-style-type: none"> 1. New geometries (non-Euclidean), algebras, and arithmetics. 2. The theory of the infinite (set theory of Cantor). 3. The theory of groups. 4. Differential equations/Differential geometry. 5. Transformation Groups laid the mathematical groundwork for Einstein.

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<i>Philosophy</i>	<i>Mathematics</i>
<p>the physical universe represents a stage forming the expanding outer boundary of interactional relations between the object and events that constitute its being. Space and time form a continuum and exist in an inseparable relation to mass-energy structures. This unity means that mass-energy objects determine the curvature of space-time and that curvature, in turn controls the motion of the masses. Thus mass-energy structure and space-time geometry are dynamically and integrally related.</p> <ol style="list-style-type: none">3. The Incarnation of Christ is made more comprehensible by using a relational, rather than a container, framework.4. Geometry and Physics inhere in each other.5. Maxwell wrote about “embodied mathematics.”	

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STARTING POINTS

MATHEMATICS: A MEANS TO DISCOVER ORDER IN A PRE-ESTABLISHED UNIVERSE	MATHEMATICS: A MEANS TO CREATE ORDER OUT OF A UNIVERSE OF CHAOS.
<ul style="list-style-type: none"> • Charles Hermite (1822-1901), “There exists a world which is the collection of mathematical truths, to which we have access only through our intellects, just as there is a world of physical reality; the one and the other independent of us, both of divine creation ... the synthesis of the two is revealed partially in the marvelous correspondence between abstract mathematics on the one hand and the physical world on the other.” • Sir James Jeans (1877-1946), “Nature and our conscious mathematical minds work according to the same laws.” • Albert Einstein (1879-1955), “I concur with Leibniz that there is a pre-established harmony in the universe.” • Pierre Duhem (1861-1916), “It is impossible for us to believe that this order and this organization [revealed by mathematical theory] are not the reflected image of real order and organization.” • Hermann Weyl (1885-1955), “There is inherent in nature a hidden harmony that reflects itself in our minds under the image of simple mathematical laws.” • The more profoundly our understanding penetrates the universe, the more clearly and fully the “pre-established harmony” between mind and nature, between what we think and what we think about, is revealed. • There is an actual correspondence, indeed, a harmony, between reality (laws of nature) and the mind (laws of thought) <i>only if one’s mind is conformed to the mode of rationality afforded by reality.</i> • It is the coherence between the created world and Jesus, the Word of God, the speech of created reality and the uncreated Speech of 	<ul style="list-style-type: none"> • Morris Kline, “It may be that man has introduced limited and even artificial concepts and only in this way has managed to institute some order in nature ... nature itself may be far more complex or have no inherent design.” • Morris Kline, “The plight of man is pitiable. We are wanderers in a vast universe, helpless before the devastations of nature, dependent upon nature for our food and other resources, and uninformed about why we were born and what we should strive for. Man is alone in a cold and alien universe. He gazes upon this mysterious, rapidly changing, and endless universe and is confused, baffled, and even frightened by his own insignificance ... The life of man is solitary, poor, nasty, brutish, and short. He is the prey of contingent happenings. Endowed with a few limited senses and a brain, man began to pierce the mystery about him ... his quest is the quest for order ... his chief accomplishment, the product of man’s own reason, is mathematics.” • It is religiously essential for humanistic mathematicians to create their own world and hence their own mathematics. Since there is not God, there is no “mathematic,” [an ultimate order that mathematical theory dimly reflects] only various man-created mathematics.

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God, that gives the created world intelligibility and significance (mathematics provides commentary on this speech).

THE ONE AND THE MANY

WHO IS GOD IN HIS ETERNAL BEING?

There is only one God but, in the *unity* of the Godhead, there are three coeternal and coequal persons (the Father, the Son, and the Holy Spirit), the same in essence (all three God) but distinct in existence (the Father is not the Son, the Son is not the Holy Spirit, the Father is not the Spirit). The tie that binds the three persons is the relationship of self-giving love, the dance of *perichoresis*, the light of truth and inexpressible joy (I John).

There are no *particulars* (Father, Son, and Holy Spirit) not related to the universal (One God).

Particulars are ultimate.

There is nothing universal that is not fully expressed in the particulars (the Father is fully

God, the Son is fully God, and the Holy Spirit is fully God).

The universal is ultimate.

Therefore, *unitary* theological thinking requires us to embrace the truth that the particulars and the universal are both *equally ultimate in the ontological Trinity*.

THE PROBLEM OF PHILOSOPHY

MANY
PARTICULARS
NATURE

Absolutized: Particulars are just unrelated and meaningless facts.

Result: Confusion (no integrative meaning).

ONE
UNIVERSAL
GRACE

Absolutized: Particulars are invalidated and therefore unessential.

Result: Authoritarianism (evidence does not matter).

THE TRINITARIAN SOLUTION

Jean Paul Satre, "If a finite point does not have an infinite reference point, it is meaningless and absurd."

Particulars must have a reference point: The Infinite, Personal, Triune God of Scripture.

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WHAT WOULD BE THE CHARACTERISTICS OF A UNIVERSE CREATED BY SUCH A GOD?

“For since the creation of the world His invisible attributes, His eternal power and divine nature have been clear seen ...” (Romans 1:20).

When the Biblical God, the Infinite, Personal, One and the Many, creates, He externalizes His essential nature (Three in One and One in Three) in what He makes. Creation therefore reveals the “One and the Many.”

There is a universal that gives meaning to the particulars of creation, for no particular is a fact apart its ground in the Triune God.

Therefore, no particular fact can have a valid interpretation in and of itself.

As Gödel noted, even mathematics, the arithmetic of counting numbers, must have a referent *outside the system*.

Creation is made up of particulars (e.g., the rationality of number and space) that give expression to the rationality of the “One in Three” creator and sustainer of all things.

The Triune God created the real world through the Word of the Second Person, Jesus Christ, who is therefore the ground of the inherent relationships of the created order. *We see creation in truth by hearing that Word.*

The particulars (the sensible: experienced through the senses *a posteriori*) and the universal (the intelligible: known in the mind *a priori*) are both equally ultimate in the created reality; they inhere in each other.

TRUTH IS THE CORRECT INTERPRETATION OF THE FACTS.

The rational order of creation is what it is because it is grounded upon the ontological Trinity.

The Biblical Christian world view: the self-contained and Triune God is the ground of existence and therefore the final reference point in all interpretation.

The humanistic view: the self-contained man or inanimate matter is the final reference point in all interpretation.

Western Civilization is a “cut-flower” world. Biblical Christianity is at its roots, but humanistic man has severed the connection. The flower of civilization, being thus cut, can only wilt and die. Salt and Light returns the flower to its source by resurrection and renewal of the mind.

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THE DOCTRINE OF CREATION

THE HEAVENS AND THE EARTH

ALL THINGS, INVISIBLE AND VISIBLE, CREATED BY THE TRIUNE GOD

Genesis 1:1f, “In the beginning God created the heavens and the earth ... and the Spirit of God was hovering over the face of the waters. Then God said ... and God saw that it was good.”

Psalms 104:25, “O Lord, how many are Thy works! In wisdom Thou hast made them all ...”

The One God,

 Father (plan),

 Son (Word executes plan), and

 Spirit (The Word executes plan in the context of the movement of the breath of God),

Created all things

 by His power,

 in His wisdom, and

 reflecting His goodness.

Colossians 1:16 (John 1:1-4), “For in Him [The Son who is the Word] all things were created, in the heavens and on earth, visible and invisible, whether thrones or dominions or rulers or authorities – all things have been created through Him and for Him.”

The universal quantifier (all things visible and invisible) \Rightarrow the structure that mathematics gives commentary to is included.

What, then, do we mean by mathematics?

1. The historically growing field of knowledge consisting of the thoughts of mathematics.
2. The objectively real structure and order in creation (what is “out there”) that the mathematics intersects.
 - a. Godfrey H. Hardy (1877-1947), “I believe that mathematical reality lies outside of us ...”
 - b. Heinrich Hertz (1857-1894), “One cannot escape the feeling that these mathematical formulas have an independent existence and an intelligence of their own; that they are wiser than we are, wiser even than their discoverers; that we get more out of them than was originally put into them.”
 - c. Nikolai I. Lobachesky (1793-1856), “There is no branch of mathematics, however abstract, which may not someday be applied to the phenomena of the real world.”
 - d. George Temple (1901-1992), “Mathematics is the language of physics ... a language can be considered in at least two different ways, either in relation to the purpose which it serves as a medium for the expression of ideas or in relation to its internal structure.”

ALL THINGS, INVISIBLE AND VISIBLE, SUSTAINED BY THE TRIUNE GOD

Colossians 1:17, “... In Him all things hold together [cohere].”

Hebrews 1:3, “... upholds all things by the word of His power.”

Thoughts to ponder:

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1. Jacob Bronowski (1908-1974), “Mathematics is in the first place a language in which we discuss those parts of the real world which can be described by numbers or by similar relations of order” (*Science and Human Values* [Pelican, 1964], pp. 84-85).
2. Larry Zimmerman, “Mathematics is an entity which always exists in the mind of God, and which is for us the universal expression of His creative and sustaining word of power ... So we would expect the deepest scientific probes into the micro- or macro-cosmos to reveal a language fabric in which are woven the forces and relationships governing the tangible creation. This language fabric should itself be suggestive of an intellectual antecedent, an orderly, powerful, infinite universe of thought, ‘a terra incognita of pure reasoning’ which ‘casts a chill on human glory.’”
3. Vern Poythress, “In exploring mathematics one is exploring the nature of God’s rule over the universe; i.e., one is exploring the nature of God Himself.”

MAN

IMAGE OF GOD

Genesis 1:26 “... Let Us make man in Our image, according to Our likeness; and let them rule ...”
Man, created in the image of God (set apart to live dependently upon Him), was made to rule (power) the creation as a vice-regent.

1. Prophet: to know and to interpret God’s creational structure.
2. Priest: to relate all things to the Creator.
3. King: to tend (cultivate) the garden and name the animals of God’s creation (Genesis 2).

FALL

Genesis 3 – man as god.

Romans 1:18, “For the wrath of God is revealed from heaven against all ungodliness and unrighteousness of men, who *suppress* the truth in unrighteousness.”

In the historic, space-time fall, man became his own god. This autonomy produces fragmentation in every area of life (including mathematics). Therefore, we expect that the mathematical structure of creation will be misunderstood and perverted by fallen man for he is guiltily blind to the glory of God revealed in the unique mirror of mathematics.

Man is either a covenant-keeper or a covenant-breaker. As a covenant-breaker, he is *anxious* to keep from seeing the facts for what they really are – the handiwork of God.

AUTONOMOUS MATHEMATICS

Morris Kline, “Mathematics is a man-made, artificial subject ... a body of knowledge containing no truths.”

FRAGMENTATION

David Hilbert (1862-1943), “Mathematics is a meaningless, formal game.”

Bertrand Russell (1872-1970), “Mathematics is the subject in which we never know what we are talking about, nor whether what we are saying is true.”

CRY FOR ANSWERS

Eugene Wigner, Nobel Prize winner in Physics (1960): “The enormous usefulness of mathematics in the natural sciences is something bordering on the mysterious ... there is no rational explanation for it ... it

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is difficult to avoid the impression that a miracle confronts us here. The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve. We should be grateful for it, and hope that it will remain valid in future research and that it will extend, for better or for worse, to our pleasure even though perhaps also to our bafflement, to wide branches of learning.”

Morris Kline, “But where and what are the physical agents that produce the effects mathematics describes? ... There are no answers ... Why does mathematics work? We are faced with a mystery ... The study of mathematics and its contributions to the sciences exposes a deep question. Mathematics is man-made. Yet with this product of his fallible mind man has surveyed spaces too vast for his imagination to encompass, he has predicted and shown how to control radio waves which none of our senses can perceive, and he has discovered particles too small to be seen with the most powerful microscope. Cold symbols and formulas completely at the disposition of man have enabled him to secure a portentous grip on the universe. Some explanation of this marvelous power is called for.”

Adam did not create the animals; he just named them.

Is mathematics discovered or invented? There is coherence between the two as there is coherence between thought and existence. Nature does not reveal equations; man creates the symbols and syntax of Algebra. But man does not impose these symbols and syntax on nature; they are developed so that they sync with the rationality objectively inherent in nature itself.

$2 + 2 = 4$ coheres with created reality. Computing aerodynamic equations in the wrong units or making an arithmetic mistake while doing so will cause malfunction because the *results do not cohere with created reality*. If you do not square the foundation of a building at the start, problems multiply when constructing the framework.

Man does not “create” mathematics autonomously. With the mind given to him by God, he “discovers” the nature of reality that lies outside of him. Mathematics is a way of “putting a word” to this reality.

Godfrey H. Hardy, “... our function is to discover, or observe it [mathematical reality], and that the theorems which we prove, and which we describe grandiloquently as our creations are simply notes on our observations.”

RESTORATION

Psalm 8:6, “Thou dost make him to rule over the works of Thy hands; Thou has put all things under his feet.”

Hebrews 2:7-9, “... for in subjecting all things to him, He left nothing that is not subject to him. But now we do not yet see all things subjected to him. But we do see Him, ... namely, Jesus ...”

Only in Christ can man be fitted with the proper eyeglasses with which he can see creation with a clear (true) vision; i.e., to see the mathematical structure of God’s (not nature’s) manifold works and to give honor to Whom honor is due.

Only the man redeemed by Christ and renewed in mind can shine the pure light of God’s truth into the darkness of humanistic, autonomous mathematics.

PRACTICAL OUTWORKING

“We all know that $2 + 2 = 4$ in the base 10 number system.”

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Is this a “neutral” statement?

Does this statement exist independent of any presuppositions?

QUESTIONS

What is truth? Is this statement true in a pragmatic or absolute sense? How do we *know* it is true?

1. Do we know it to be true *a priori*? Is it true because of the internal evidence of our intuition which is *independent* of our experience?
2. Do we know it to be true *a posteriori*? Is it true because of the external evidence of our experience?

Nicholas Bourbaki (collective pseudonym for a group of French mathematicians), “Mathematics appears thus as a storehouse of abstract forms ... and it so happens – without our knowing why – that certain aspects of empirical reality fit themselves into these forms, as if through a kind of preadaptation.”

John W. N. Sullivan, “Why the external should obey the laws of logic; why, in fact, science should be possible, is not at all an easy question to answer.”

Cornelius Van Til, “Sinners use the principle of chance back of all things and the idea of exhaustive rationalization as the legitimate aim of science. If the universe were actually what these men assume it to be according to their principle, there would be no science. Science is possible and actual only because the non-believer’s principle is not true and the believer’s principle is true. Only because God has created the universe and does control it by His providence, is there such a thing as science at all.”

Is this an *isolated* truth?

Is this truth merely *unity*?

Or, does it have a relationship to other experiences? Is this truth *diversity*?

Who is the “we all know”?

What is the nature of man?

Why can he communicate and know?

How can he communicate and know?

What does it mean?

Put two apples in an empty bag, add two more, and then count that there are four. To do this, you must presuppose:

1. Faith in the existence of an external world outside of man (object-subject).
2. Man has memory and it is trustworthy (I remember that I put two apples in the bag).
3. Man has the ability to distinguish one thing from another (I can distinguish one apple from another apple).
4. Man has the ability to count (I can count four apples: 1, 2, 3, 4).
5. Faith in man’s ability to relate mathematical formalism to the objective world (I can name one apple with the symbol “1”).
6. Faith that things behave in the same way irrespective of the observer (my friend will count the same number of apples and if my friend counts them, I believe his report).
7. Man knows the meaning of addition in the context of counting (addition is counting forward).
8. Man knows the basic principles of logic (either this object is an apple or it is not an apple).

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9. Man knows that the universe does not operate by chance; faith in the existence of a rational order in the physical world (the apples will remain apples while I am counting them).
10. Man knows that time is sequential, not circular (events are distinct from one another and act linearly).

Why does the “inherent” concept of “twoness” and “fourness” apply to the real world?

What is its purpose?

What is the motivation for knowing this?

ANSWERS

OBJECTIVE CREATION

In order to effectively use mathematics, we must presuppose that the universe is:

1. “Outside of us” as an objective reality.
2. Orderly.
3. Makes sense.
4. Holds together.

Man’s mind, with its intuitive capabilities, and external reality, which can be experience, *cohere* because God, the One and the Many, created them both.

The Biblical God is the *personal* unifying factor that reconciles what is irreconcilable in the humanistic context.

Two clear-cut choices:

1. None of mathematics originates with God; i.e., it is just the product of man’s autonomous reason and the answer to the coherence problem will forever remain a mystery.
2. All of mathematics originates in God (in a perfect “mathematic” of reason, wisdom, order, and coherence – only found in the mind of God).

MAN IN CHRIST: PROPHET, PRIEST, AND KING

Because man is created in God’s image, he can know, understand, and use God’s creation.

Because man is only the image of God, his knowledge is not exhaustive.

1. Man’s mathematics is limited.
2. Man can discover more about mathematics!

Because man is made in the image of God and coherence exists between his mind and external reality, then he can count, remember, distinguish, and communicate.

$2 + 2 = 4$ bears witness to God because He is the author of it.

Man, in his fallen state, *suppresses* this truth.

Dr. Remo J. Ruffini (physicist at Princeton University), “How a mathematical structure can correspond to nature is a mystery. One way out is just to say that the language in which nature speaks is the language of mathematics. This begs the question. Often we are both shocked and surprise by the correspondence between mathematics and nature, especially when the experiment confirms that our mathematical model describes nature perfectly.”

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Dr. Ruffini admits that this problem can be solved by positing God. But he prefers to deny the theoretical possibility of a correlation and meaning than to admit the reality of the Creator God.

Man, redeemed by Christ, is the only one who can properly understand the place of mathematics in the world of God's making. As a priest of creation, man employs mathematics to give praise to Him.

METHODOLOGY AND PERSPECTIVES

Biblical Christian educators (parents, headmasters, board members, pastors, support staff, and teachers from K to University) have a difficult charge in front on them. They all must recognize the “utility of beauty” nature of mathematics and its importance in the school curricula. Although mathematics is never to be absolutized as an “end all and be all” of the curricula, it must not be minimized or diminished in favor of other subjects or extra-curricular activities. I summarize this brief essay with recommendations for thought and action:

1. From K-6, arithmetic must be carefully taught “line upon line, precept upon precept.” Careful attention must be paid to the *beauty* of the fine nuances of arithmetic; i.e., the *beauty of its utility*. According to the Israeli mathematician Ron Aharoni, the author of *Arithmetic for Parents*, a resource that every headmaster, teacher, and parent should study:

... elementary mathematics isn't simple at all. It has depth and beauty ... Proper teaching of mathematics depends more on an understanding of the mathematical principles than on educational tricks. It requires familiarity with the way the fine mathematical layers lie one upon the other.²

The elementary arithmetic we learned as children contains some of the most beautiful mathematical discoveries ever made. Why, then, is it not perceived by most people as beautiful? Mainly because it is often learned mechanically, in a way that does not reveal its beauty.³
2. Teachers need to know the *utility* of mathematics.⁴ They should be able to connect it to the real world of their student's experiences and to the real world of providential history, covenantal science, the *total truth* of the Biblical Christian world view, and the fascination of mathematical biography. Many math teachers surprisingly do not know much of these applicable real world connections, connections that will resurrect their teaching with life and motivation.
3. Teachers need to know the *beauty* of mathematics.⁵
4. Non-math and non-science teachers need to appreciate this mathematical “utility of beauty” paradigm because the same wonder is revealed in the study of grammar, history, language, logic, theology, rhetoric, etc.

² Ron Aharoni, *Arithmetic for Parents: A Book for Grownups about Children's Mathematics* (El Cerrito, CA: Sumizdat, 2007), pp. v-vi.

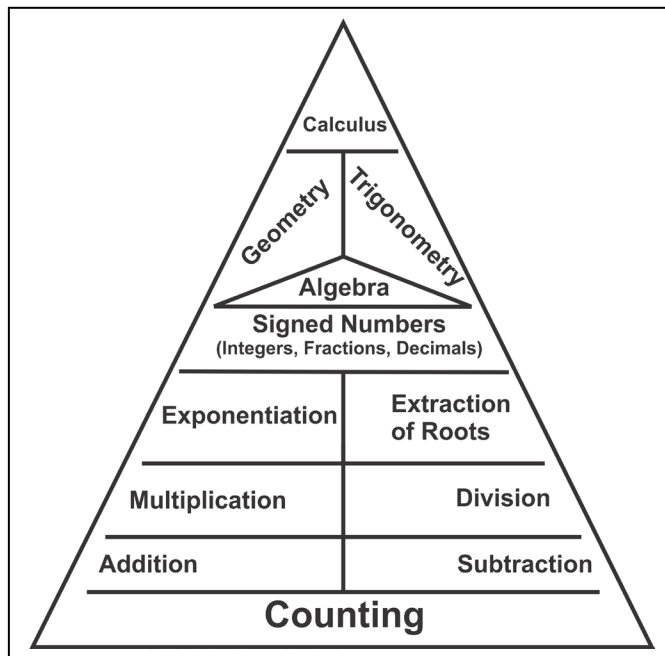
³ *Ibid.*, p. 16.

⁴ *Mathematics and the Physical World*, written by Morris Kline in 1959 (reprinted by Dover Publications), is a good place to start if you need to learn this utility.

⁵ The textbooks written by Harold R. Jacobs (*Elementary Algebra, Geometry: Seeing, Doing, Understanding, and Mathematics: A Human Endeavor*) employ the “beauty of utility” theme magnificently.

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THE ELEMENTARY STRUCTURE: COUNTING TO CALCULUS



THE ELEMENTARY STRUCTURE OF COUNTING

