CHRISTIAN EDUCATION AND THE MATH PROBLEM

BY JAMES D. NICKEL

As a math teacher, I have been a keen observer of and participant in Christian education since the late 1970s. Starting in the 1980s, maybe sooner, there was an increased emphasis on bringing to bear Christian perspectives to every subject in the curriculum. Math proved to be a problem child since most educators did not know how to tame it Christianly.

REINVENT TRADITION AND BAPTIZE IT

Because of this, several approaches to "integrating with Christian faith with mathematics" rose to the surface. In part a rejection of the New Math thrust of the 1960s, one approach was to revert to the "good ol' days" and employ the traditional curriculum skill-set methodology of the 1940s and 1950s. It was left to the teacher to do the "Christian" integration, usually in the form of baptizing these curricula with Bible verses (e.g., ABEKA and Bob Jones math). Students may have learned the skills, but they missed the beauty of the subject, including its historical connections.

THE ENGINEERING WAY

Due to lowering SAT scores, in the 1980s the engineer John Saxon sought to rejuvenate those scores by employing the pragmatic Pavlovian rote-skill method. The burgeoning homeschool movement plucked up these textbooks because they were so easy to use. Just give it to Johnny, and you can walk away. High SAT scores are forthcoming! Students may have learned the skills, but most were bored to death by the dry, mind-numbing, and repetitious nature of this curriculum.

TRUTH, BEAUTY, AND GOODNESS

In the 1990s, the Classical Christian Education movement began to gather steam. Their emphasis was truth, beauty, and goodness, the heritage of the ancient Greeks. The math anomaly of this movement was that many of these educators chose to use Saxon math! The ugliness of Saxon math does not comport with the vision of beauty that these schools embrace.

A MIX MASH OF APPROACHES

Since 1990, groups of people have developed a multiplicity of math curriculum offerings, mostly aimed at the economic potentials of the homeschool market. Some of these are Math-U-See, Teaching Textbooks, Horizons Math, Miquon Math, ACE math, and Alpha-Omega math. As these programs advance to higher levels, the one unifying theme is the lack of rigorous and heuristic arguments. Sometimes I wonder if the people who write these curricula know much about the way the language of mathematics works. Because of these deficiencies, many Christian educators have resorted to the corresponding multiplicity of math offerings from secular publishers as a way to adequately prepare their students for college-level work, trying to augment these curricula with whatever understanding they have of the Christian vision. Unfortunately, these curricula are a mixed bag when it comes to teaching algebraic syntax, using rigor and heuristic arguments, exploring the beauty of mathematics, and connecting math themes to history and science. Some do better than others (e.g., the math texts by Harold R. Jacobs and Paul Foerster), while others are woefully inadequate, strong in some points, weak in others. Most importantly, students, even if they are well-taught in mathematical techniques and syntax, are left devoid of the Christian, indeed the Trinitarian vision of life and the cosmos. That Jesus is the Light of the cosmos has no bearing on what these students are learning in their math classes.

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THE STATE OF THINGS

Despite what math education has done since the 1980s, high school math scores in the United States are still in the bottom third of developed nations, better only than Iceland, Spain, Luxembourg, Latvia, Malta, and Lithuania.[1] In spite of self-aggrandizing claims/statistics from some homeschooling advocates, homeschoolers have not made much of an improvement. Many do less rigorous math than students in public schools because doing real mathematics is hard for many students to do on their own, and, as well, to teach. Many homeschoolers use more than one math curriculum in their experience, changing textbooks primarily to find something easier to use.

RESOLUTION IN THE TRINITARIAN VISION

Is there a resolution to the math problem in Christian education? Christians, of all people, should be leaders in resolving all problems of culture, especially this math problem, by pointing to a vision that enchants the heart of culture, a vision that transforms a culture's plausibility structure. Theologian Thomas F. Torrance leads us to the right path:

> Mathematical formulae really hold good for the inner order of nature. Number or at least something corresponding to it, is embedded, as it were, in nature, and therefore not only is nature amenable to rational inquiry, but the mathematical formulations that arise out of it can only be in a form which expresses at once the nature of the object and the mode of its cognition. This is pushed to its extreme point in the view of Sir James Jeans that number is embedded in nature because it was created by a Pure Mathematician (aka. God). At the opposite extreme is the view that it is we alone who inject number into nature. If the first extreme rests upon a univocal relation between mathematics in nature and mathematics in God the latter does not take seriously that some real coordination is involved between our scientific theories and the rational structures of nature.[2]

Glory is the essential nature or the reality of any given object or person at its fullest and best. When we understand the fundamental character of mathematical processes, we touch its glory. The Cappadocian church fathers reframed the Greek word *perichoresis* as a way to signify the mutual indwelling or interpenetration of one object contained in another. They used this word to enable them to articulate the meaning of John 14:20, particularly the word "in," reflecting the mutual relationship between the Father and the Son in the Holy Spirit. To them, the ultimate of glory and perichoresis is the onto-relational God revealed Scripture through Jesus by the Spirit, the loving, self-giving relationship of One in Three and Three in One. What this Triune God creates will reflect the glory of interconnected relationships, both organic and inorganic, inanimate and animate.

Therefore, as we observe the universe of this the Triune God's making, we discover that is characterized throughout by a flexible structural relatedness in which man, the *imago Dei*, himself shares since he is in tune with that which he is summoned to pursue in this scientific inquiries.

We can expect to discover, and we do find connections embedded in creation, dynamic patterns of beauty and elegance. Two examples of this pulse of beauty are:

(1) Leonhard Euler's (1707-1783) identity relating π, e, $i = \sqrt{-1}$, addition, exponentiation, multiplication, addition, and the multiplicative and additive identities.

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[1] https://edsource.org/2016/u-s-math-scores-decline-on-international-test-of-15-year-olds/573768
[2] Thomas F. Torrance, *Theological Science* (Oxford: Oxford University Press, 1969), p. 94.

http://www.biblicalchristianworldview.net/donCurriculum.html

(2) James Clerk Maxwell's (1831-1879) equations revealing the interpenetrating nature of electricity and magnetism.

The discipline of mathematics is the search for perichoretic patterns, the language fabric of creation. It is one of the peerless tools that we use to discover and investigate creational wonders, the beautiful rhythms of its multi-layered, interpenetrating structures.

You see proximate revelations of perichoresis in the created order whenever you see relationship, link, bond, affiliation, correlation, interdependence, interaction, interpenetration, interconnection. This one word opens a universe of understanding. It is to indwell and to articulate this Trinitarian vision that I have labored the last 17 years to develop the math curriculum *The Dance of Number*, a curriculum that:

- brings to light the multiplicities of the perichoretic nature of creation and mathematics,
- coordinates beauty, truth, and goodness with rigor and heuristics,
- teaches mastery of number sense and algebraic syntax,
- integrates math themes with history, science, and personalities,
- structures mathematics as an interconneted framework, and
- explores the dynamic interrelatedness of Arithmetic, Algebra, Geometry, Trigonometry, and Science, plus much, much more.

Upon the publication of this curriculum, the responsibility is on Christian educators to employ it, not ignore it. They now have in their hands, if used faithfully, a guarantee that students will be well-taught in mathematical techniques and syntax, all embodied in the Trinitarian vision of life and the cosmos. That Jesus is the Light of the cosmos will have a bearing on what these students are learning in their math classes.