MATHEMATICS AND LANGUAGE

BY JAMES D. NICKEL

Mathematics is a unique kind of language. Learning its *symbols* (=, ≈, x, y, z, <, ≥, etc.) are the nouns and pronouns of the language. Learning its operations and order (+, -, ×, ÷, etc.) are the verbs. Through a long and involved historical process, man has created the symbols and their interaction with each other to reflect the *universal* nature of numerical and spatial reality; i.e., *the way things work in God's world.*[1]

The Biblical Christian knows, from *revelation*, that creation speaks. "The heavens declare the glory [i.e., the inescapable weight of the godhead of God] of their Creator" (Psalm 19:1-6). The heavenly bodies are communicable "time-pieces" that serve man on earth (Genesis 1:14-18).

A Biblical Christian understanding of the *universal language* of mathematics starts by analyzing the meaning of "universe" and the meaning of "language."

First, *universe* presupposes interconnectedness or "unity in diversity." This is what Genesis 1 means by stating and restating the *goodness* that is reflected in what God has made. The basic presupposition of science is to discover unity in the vast diversity of God's creation. The construction of scientific law[2] reflects this unity. To order to make use of this unity (i.e., laws), they must be defined using mathematical relations. Hence, the structure of the physical creation and the structure of mathematics are interconnected. The physical world and the patterns revealed in mathematics cohere because of a common Creator. Thus, with one law (e.g., Isaac Newton's *Universal Law of Gravitation*), you can connect (unify) the motion of the moon (motion celestial) with the falling of an apple from a tree (motion terrestrial).[3] The diversity of motions celestial and motions terrestrial is unified in terms of mathematics. This is the Biblical Christian understanding of the *universal* nature of mathematics.

Second, language presupposes communication, and communication presupposes personality. The Living God of

> Without this language (mathematics) most of the intimate analogies of things would have remained forever unknown to us; and we should forever have been ignorant of the internal harmony of the world, which is the only true objective reality .... This harmony ... is the sole objective reality, the only truth we can attain; and when I add that the universal harmony of the world is the source of all beauty, it will be understood what price we should attach to the slow and difficult progress which little by little enables us to know it better.
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> Henri Poincaré, "The Value of Science," *Popular Science Monthly*, 1906, pp. 195-196.

> In mathematics, we have a universal language, valid, useful, intelligible everywhere in place and time.
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> Edward Kasner, *Mathematics and the Imagination*

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[1] Of course, unbelieving mathematicians will not recognize, in fact, they will suppress, the *ultimate* cause and rationale of this order (cf. 1:18ff).

[2] Philosophy, scientific law is a universal that reflects the patterns of particulars.

[3] The Ancient Greeks were unable to make this connection because they posited, for reasons philosophical, and indeed theological, that there must be a difference between motion celestial and motion terrestrial. It took nearly two millennia for the Biblical Christian view of universe (unity and diversity) to generate a cultural matrix in which the thinking, for example, of Isaac Newton could flourish into a truly quantitative science.

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Scripture, the infinite, personal, and Triune God communicates His nature, His truth, and His will by what He has made (in creation) and by what He has specifically revealed (in Scripture).[4] God initiates this communication. God comes to man with propositional truth. Because of God's revelatory initiative, man can communicate with God and man can communicate with his fellow-man. God communicates with man primarily through Scripture. Given this foundation, man can also rightly know, understand, and use God's communication in creation (read Psalm 19:1-6). There is an ultimate language (i.e., a voice or a word) in creation, and that language is reflected in the tool of mathematics (read John 1:1-14, Colossians 1:15-17). Mathematics is therefore a special type of language that uniquely describes the patterns of God's creational voice in and through the person of Christ.

Mathematics, as a language pattering the realities of God's creation, is therefore a "tool of wonder." It is *wonder* because, by its unique beauty and poetry,[5] we catch a "glimpse" of the Creator. It is a *tool* because, by it, we can steward the creation under God. *Tool of wonder* is the Biblical Christian understanding of the *language* nature of mathematics.

In 1612, the great Italian mathematician and scientist, Galileo Galilee (1564-1642), reflected on the nature of mathematical language:

> "Philosophy is written in this grand book, which stands continually open to our gaze. But the book cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics, and its characters are triangles, circles, and other geometrical figures without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth."[6]

To Galileo, "this grand book" (grand points to *wonder*) was God's creation and its "mathematical language" consists of geometrical figures and their relationships.

God has gifted a "sixth sense of mathematics" to man. As a gift, mathematics is a tool that helps man understand and use the patterns revealed in God's creation. Any gift of God can be misused. Mathematics, as a reflection of God's gift to man of logical reasoning, is misused (becomes an idol) when it is divorced from the God of creation. When this happens, the language, instead of being a servant, becomes God.

> Mathematics, too, is a language, and as concerns its structure and content it is the most perfect language which exists, superior to any vernacular; indeed, since it is understood by every people, mathematics may be called the language of languages. Through it, as it were, nature herself speaks; through it the Creator of the world has spoken, and through it the Preserver of the world continues to speak.
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> C. Dillmann, *Die Mathematik die Fackelträgerin einer neuen Zeit* (Stuttgart, 1889), p. 5.

Due to the influence of the rationalism of the Renaissance, the mathematical thinkers of the resultant Enlightenment absolutized mathematics. Galileo's words, *seen in an Enlightenment context*, is a portend of this absolutization. In contrast, *the Biblical Christian glorifies the Giver of the gift, not the gift or its user.*

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[4] In theology, God's revelation in creation is called *general* revelation and His revelation in Scripture is called *special* revelation. Note, both aspects of communication from God are *revelational*. Hence, *man knows on the basis of revelation.*

[5] There is a poetry in mathematics, a unique meter (rhythmic structure) that resonates due to the sustaining word of God in creation. Poetry uses words and painting uses color. Mathematics is wordless and colorless. The beauty that mathematics unveils is a logical beauty (perceived primarily by thought).

[6] Galileo Galilei, *Discoveries and Opinions of Galileo*, trans. Stillman Drake (Garden City: Doubleday, 1957) pp. 237-238.