

Ancient Greek Geometry and the Rise of Modern Science

By James D. Nickel

Speaking about ancient Greek culture, Biblical Christian historian Michael W. Kelley observed, “The gods will recede farther into the background [From Homer to Thales–JN], if not disappear altogether, and man will emerge to think and act in accordance with *abstract and impersonal ideas*. Reason in man will assume the *role of the divine* in man and become the power needed to order his life and world. Thus begins the emergence of ‘the Greek legacy’ and with it the *humanistic aspect* of Western civilization.”¹

Plato (427-347 BC) encapsulated this “abstract and impersonal idea” paradigm in his *Forms*. Euclid’s (ca. 300 BC) *Elements* (of Geometry) reflected the same rationalistic emphasis ... nothing at all in this textbook related to anything in the physical world (although, if parked in the context of the world of God’s making, Euclid’s theorems do indeed apply!). Plato and Euclid thought almost entirely in the *a priori* (independent of experience) realm. Aristotle (384-322 BC), whose “rules of logic” Euclid employed, sought to correct Plato by emphasizing the real world (*a posteriori*, dependent on experience). Although Aristotle’s biological studies were of some merit, his axioms of physics swirled in the winds of left field. He apparently never saw the need to test his laws of falling motion by dropping two objects of differing weights. Aristotle’s physics was primarily *a priori* pontifications.

The flow of history and of time was a major stumbling block to the Greek advancement of science. For them, time flowed in cycles (periods of advance followed by periods of retreat ... only to repeat *ad infinitum*). This “Great Year” idea was retrogressive and fatalistic. Aristotle thought that man’s ideas and inventions had “maxed out” in his time. There was therefore no impetus to improve anything! Also, since everything repeats, there is no use for a truly free investigation. No real science was therefore possible in this deterministic worldview.

It was primarily this cyclical view of time (along with an absolutization of *a priori* thinking) that resulted in a stillbirth of science in ancient Greek culture. It took the Biblical Christian view of time and creation to generate the necessary change in worldview that engendered the viable birth of modern science in the High Middle Ages (through the work of the 14th century scholastic theologians Jean Buridan and Nicole Oresme).

In the Biblical Christian view, time had a beginning (Genesis 1:1) and it will end (there will be a last day, the day of resurrection ... John 5:25-29). There is therefore room for

¹ Michael W. Kelley, *The Impulse to Power: Formative Ideals of Western Civilization* (Minneapolis: Contra Mundum Books, 1998), p. 39

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progress in time. God's creation, being fully consistent, can be investigated and patterns discovered because the Creator is totally rational and infinitely superior to the Platonian *demiurgos*. In the Biblical Christian world view, mathematics leaves the winds of left field to meet the need of modeling these creation patterns. Both *a priori* and *a posteriori* thinking are therefore founded on the nature of the Creator and the nature of His creation.

This fully rational, fully consistent creation is described in the Bible as resulting from the "speech" of God in creation (Genesis 1; John 1:1-14; Colossians 1:15-17). This much fuller position of the "Word became flesh" is a perspective that the Greeks of old could not muster via either *a priori* or *a posteriori* thinking.

In the words of science historian Stanley L. Jaki (1924-2009), "This is why science implies much more than the Greek way of looking at the world, a way which, however rational [*a priori* - JN] as long as it dealt with the abstractions of geometry, *was not rational enough when it came to physical reality*. In the end it became the prisoner of an irrationality which barred access to the novelty of a self-sustaining science, the only science worthy of its name."²

² Stanley L. Jaki, *Chance or Reality and Other Essays* (Lanham, MD: University Press of America, 1986), p. 221.