

Copernicus, Kepler, and the Role of Christianity in the Development of Cosmology

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In the second century, Ptolemy collected all the best knowledge of the heavens that was available to him at the time, fixed them with a mathematical basis, then published the “high point of Greek astronomy,” his book titled “Mathematical Synthesis” (later given the Arabic title “Almagest,” meaning “The Great”).¹ Ptolemy’s model of the universe was geocentric; i.e., he had the Earth at its center.² He agreed with the prevailing thought in ancient Greece that the orbit of the planets around the Earth was uniform, circular and unchanging. Unfortunately, though, the planets did not actually behave in the manner the Greek astronomers expected them to.³

Ptolemy proposed complicated solutions to the problem of the misbehaving planets, solutions involving eccentric orbits (i.e., orbits that did not center on the Earth) and epicycles (i.e., “a smaller circle about which the planet orbited that was, in turn, carried around the larger eccentric orbit”). While his model was a mess, he was able to reasonably chart the movement of the planets by altering the rotation speeds of the various circles.⁴

For Copernicus, however, Ptolemy’s model was simply too much of a mess for it to have been designed by God. As a result, he dove into research in an effort to find an alternative, eventually resulting in his development of a heliocentric version.⁵ In other words, it was

¹ James Hannam, *The Genesis of Science: How the Christian Middle Ages Launched the Scientific Revolution* (Washington, DC: Regnery Publishing, 2011), 63.

² *Ibid.*, 270.

³ *Ibid.*, 271.

⁴ *Ibid.*

⁵ *Ibid.*, 276, 77.

Copernicus' theistic worldview that led him to find Ptolemy's model unacceptable and that defined the contours of what Copernicus felt would be an appropriate solution.

According to Del Ratzsch, most modern philosophers of science acknowledge that the conclusions at which we arrive are at least in part influenced by our perspectives. When scientists choose which theories to advance, their choice is influenced by more than just the empirical. It is likewise influenced by our worldview.⁶ This was as much true for Copernicus as it is for scholars today. Modern scientists, for example, presuppose a universe that demonstrates uniformity. But they may fail to appreciate that the origin of this belief in uniformity, for astronomers such as Copernicus, was grounded in their Christian beliefs. Copernicus' belief that the heavens must be a reflection of the God who made them pointed him away from Ptolemy's incorrect conception of the solar system and closer to the truth. Thus, despite what many skeptics argue today, faith in God is not a stumbling block on the journey toward truth. In fact, historical figures such as Copernicus provide evidence to the contrary.

The main problem Copernicus' proposal faced amongst his contemporaries was that the evidence available to them at the time seemed to contradict it. As James Hannam explained,

When we look up at stars each night, we see that they are fixed in the same patterns, called constellations. If the earth were in motion, we should expect the stars would change their relative positions as the earth followed its orbit. ...even as we travel over the entire distance of the earth's orbit, the direction and brightness of the stars remain the same. This must mean that either they are preposterously far away, or else, as everyone in the Middle Ages thought, the earth is not moving after all.⁷

⁶ Del Ratzsch, *Science & Its Limits: The Natural Sciences in Christian Perspective* (Downers Grove, IL: Intervarsity Press, 2000), 58, 66.

⁷ Hannam, *The Genesis of Science*, 274.

Copernicus took the first option. He argued that the universe was so enormous that no matter where someone was in the Earth's orbit, the stars would appear the same. Most people at the time, however, felt that his idea violated the "principle of parsimony – the idea that nature does nothing unnecessarily," so they opted for a stationary Earth.⁸

Kepler shared Copernicus' belief in a heliocentric model. He also agreed with Copernicus that the heavens must reflect the perfection of God. Initially, he thought this perfection would be shown through geometry, with the orbits of the planets being determined by the five basic solids. However, this model turned out to be imprecise, and any imprecision was unacceptable to Kepler, again due to his belief that the heavens must show God's perfection.⁹

Eventually, Kepler was able to accurately track the motion of the planets. His Christian worldview demanded that he stick to the axiom of uniform motion, but because the idea of strictly circular orbits was actually a Greek addition, Kepler was willing to jettison it in an effort to produce something more accurate.¹⁰ As a result, he found that planets orbited the sun in ellipses, not circles. He also concluded that planets moved faster when they were closer to the sun, but that the axis of a planet's orbit traversed an equal area in any given amount of time, providing him with the uniformity he sought.¹¹

Thus, it was through Kepler's belief in the perfection of God, and as a result his belief in the uniformity of the cosmos, that he finally "cracked the mystery of the planets' movements."¹²

⁸ Ibid., 276.

⁹ Ibid., 293-94.

¹⁰ Ibid., 295-96.

¹¹ Ibid., 296.

¹² Ibid.

He viewed his scientific investigations as a religious obligation and his work as complicated theology. This made his writings extremely difficult to read, but it demonstrates how a correct, God-centered worldview helps us gain an accurate understanding of the universe around us.¹³ This explains the successes of men like Copernicus and Kepler who were operating on the basis of such a worldview.

However, this also illustrates a major flaw in the manner in which much of modern science is conducted. All too often scientists claim that we must embark on the journey of scientific discovery by assuming naturalism, as least as an operating principle. However, if history is our teacher, then the exact opposite is true. Had Copernicus assumed naturalism, he would have had no basis to believe that the mess of Ptolemy's model was problematic. Had Kepler not embraced his Christian worldview, then he would have had no reason to build upon Copernicus' work and find the beautiful uniformity of the planets' heliocentric orbits. It is precisely because these astronomers did not assume that the universe was merely a natural phenomenon, but rather was a reflection of the perfection of God, that they were able to challenge the prevailing views of their times and arrive at a more accurate understanding of the manner in which God's creation operates.

¹³ Ibid.