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Against Common Sense

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Against Common Sense

Abstract
"Scientific inquiry... allows for the exploration of phenomena that would otherwise remain beyond human intuition."

Posting about beauty and truth in creation from *In All Things* - an online journal for critical reflection on faith, culture, art, and every ordinary-yet-graced square inch of God's creation.

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Against Common Sense

inallthings.org/against-common-sense/

Channon Visscher May 2, 2018

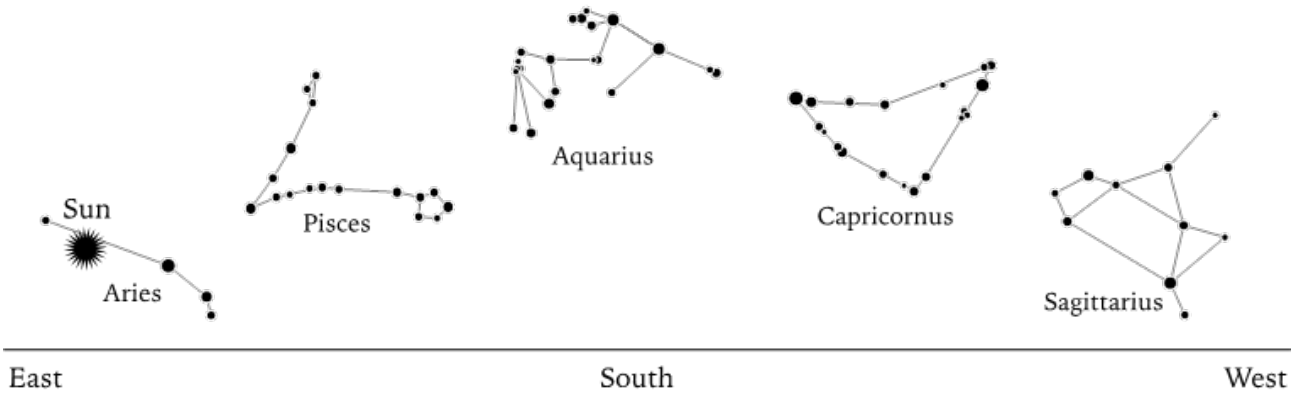
in all things

Our Functional Cosmology

This semester, I've had the privilege to co-teach (with a historian colleague) a somewhat-experimental seminar course entitled "Cosmologies." Beginning in the Ancient Near East and ending somewhere around Einstein, Hubble, and Hawking, we're exploring how people throughout history have asked—and tried to answer—the question "where did it all come from?"

In the spirit of that seminar course, I'd like to start with a quick test of our "functional cosmology." As shown in the figure below, suppose you could see the positions of the constellations in the daytime sky, and this is the view shortly after an April sunrise.

Here's the question: *in which constellation will the Sun be found at noon?*



The Sun, of course, will be higher in the sky and close to due south at noon, but it will *not* be found in Aquarius as many suppose. Some follow-up questions might help guide your answer: What is actually causing the Sun to move? So what else will appear to move? In which constellation will the Sun be found at noon?[1]

The point of this exercise is to highlight (insofar as it exists) the discrepancy between our mind and our gut: even as we intellectually subscribe to the modern Copernican view—most of us believe that the Earth rotates about its own axis and moves in its orbit around the Sun—our everyday experience of the world continues to shape our intuition.

This particular heliocentric (Sun-centered) model was problematic in the late 16th and early 17th centuries, as the traditional biblical interpretation[2] of the era assumed a geocentric (Earth-centered) cosmology consistent with the work of Aristotle and Ptolemy. Perhaps even worse, heliocentrism defied common sense. Recognizing these issues, Copernicus admitted his hesitancy in the preface of his book—published posthumously—in a letter to Pope Paul III:

Those who know that the consensus of many centuries has sanctioned the conception that the earth remains at rest in the middle of the heaven as its center would, I reflected, regard it as an insane pronouncement if I made the opposite assertion that the earth moves. Therefore I debated with myself for a long time whether to publish the volume which I wrote to prove the earth's motion… against the traditional opinion of astronomers and almost against common sense.[3]

Still, he pressed on in his belief. And, a century later, Galileo—who would later provide abundant observational evidence for a heliocentric cosmology—marvelled at Copernicus' belief even before the advent of the telescope: "…with reason as his guide he resolutely continued to affirm what sensible experience seemed to contradict."[4]

Against Common Sense

The world is full of similar examples of phenomena that defy common sense or casual observation. It defies common sense that the Earth is moving at 67,000 mph in its orbit around the Sun, yet spacecraft observations capture the Earth in its orbit as a pale blue dot caught in a Sun beam; that the North American continent beneath our feet is gradually sliding away from the African continent, yet GPS measurements indicate this is happening at 3-4 cm per year; that space-time itself can be warped by gravity, yet those same GPS satellites require adjustments to correct for gravity's effect on time, and we detect ripples in the fabric of the universe from distant violent collisions; that various elements near the bottom of the periodic table disintegrate like clockwork, yet we find odorless, colorless radon in Iowa basements; that mass can be converted into energy, yet the Sun shines.

Writing on the eve of the Copernican revolution, John Calvin recognized the appearance of such discrepancies between scientific results and common sense:

Moses makes two great luminaries; but astronomers prove, by conclusive reasons, that the star of Saturn, which, on account of its great distance, appears the least of all is greater than the moon… if the astronomer inquires respecting the actual dimensions of the stars, he will find the moon to be less than Saturn; but this is something abstruse, for to the sight it appears differently.[5]

In other words, even where scientific conclusions appear to contradict common sense ("something abstruse") we may nevertheless recognize their validity. Moreover, we recognize that these descriptions are not provided as frivolous over-complications of reality, but as the result of close and careful study of that reality's witness. This approach is necessary because our everyday human experience provides no categories of thought that would allow us to intuitively comprehend the hidden structures and vast scales of space and time we encounter in the physical creation. **Scientific inquiry thus allows for the exploration of phenomena that would otherwise remain beyond human intuition.**

Yet Seeking Truth

Now, I should note that this is not intended as a criticism of the inductive method[6] or a denial of the important role of careful observation and informed intuition in scientific inquiry[7]: science is after all a creative, human, activity. But at the same time, science is motivated as the exploration of a physical reality that exists independent of human experience. Despite the intrinsic limitations of the inductive method, the work of science in "getting nearer to the truth would be pointless without an objective reality, a world which we make it our task to discover."[8]

A similar motivation grows out of our Christian confession that *God created the heavens and the Earth*, so that the "universe is before our eyes like a beautiful book…to make us ponder the invisible things of God: God's eternal power and divinity" (Belgic Confession, Article 2) leading to wonder and worship. In other words, the physical creation serves as reliable witness that *tells us something*.[9] Given this revelation (*the heavens declare*…), we experience an often counterintuitive—yet comprehensible—universe.

The implication is that scientific inquiry seeks creational truth. Johannes Kepler would go so far as to say scientific discovery thus represents a way of "thinking God's thoughts after him," a "rediscovery" of the laws of creation. This persists even as we recognize that leading scientific theories may simply represent descriptive *models* of some deeper objective reality or truth.[10]

For example, Kepler developed his third law of planetary motion (1619) by induction, using the detailed observational records of Tycho Brahe. To what extent does this "harmonic law" represent a *human creation* or a *discovery* of cosmic truth? Even if it merely *models* cosmic behavior, its powerful descriptive and predictive capabilities, its later affirmation by robust and elegant deduction from Newton's theory of gravity (1687), and its ongoing action observed across thousands of planetary systems suggest that it at least approaches some truth—some objective reality—embedded in the structure of the physical creation.

The recognition of our limits in the face of a vast and ancient universe—and the dynamic nature of scientific inquiry in one sense as a series of ever-improving approximations—is a call to humility and wonder and joy in exploration. For in this, we celebrate scientific discoveries precisely where the inscrutable or abstruse breaks through into our intuition and allows a flash of insight, a moment of understanding, and a glimpse of the truth and beauty of creation.

Footnotes

1. The Sun will still remain in Aries at noon; it will be another 10 months before the Sun is in Aquarius. ↩

2. For example, Jos 10:13, Psa 19:1-5, 104:5, Ecc 1:5; Isa 40:22. These were among the verses cited in Galileo's trial documents. ↩

3. Nicholas Copernicus, preface to *The Revolutions of the Heavenly Spheres* (1543) ↩

4. Galileo Galilei, speaking through the character of Salviati in The Second Day of *Dialogue Concerning the Two Chief World Systems*, Second Day (1632) ↩

5. John Calvin, *Commentaries on Genesis,* 1:16 (1554) ↩

6. The inductive method involves the development of *universal statements* from *particular statements*. For example, if I have only ever observed white swans, making the universal statement "all swans are white". Using this example, Karl Popper points out the problem of induction in *The Logic of Scientific Discovery* (1959): we may yet encounter a swan that is not white. Nevertheless, the inductive approach can play a key role in the development of new scientific hypotheses seeking a coherent explanation of observational data. ↩

7. On the occasion of Max Planck's 60th birthday, Einstein noted that the search for new universal laws of nature can only first be reached by an "intuitive" leap based upon *Einfühlung*, a "sympathetic understanding of experience"; Albert Einstein, *Principles of Research* (1918) ↩

8. Karl Popper, *Realism and the Aim of Science* (1956, 1983) ↩

9. Ps 19:1-2, Ps 97:6, Rom 1:19-20, Heb 11:3, Acts 14:15-17, but see also Job 38ff. Alvin Plantinga (*Where the Conflict Really Lies*, 2011) in a variation of the anthropic principle, notes that "there is an adequation of the intellect to reality"; i.e. that we are, despite our limitations, created to comprehend the universe in which we live. ↩

10. An obvious example in modern science is the quantum mechanical nature of the world at atomic and subatomic scales. Quantum behavior raises the question of whether creation itself is actually this bizarre or if we're simply seeing the limitations of human thought. ↩