The Attralucian Essays:

Exploring the Finite

First Edition

 Typeset in LaTeX

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The Geofinite-Kuhnian Conjecture
Paradigms as Alphons, Revolutions as Curvature Shifts

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Introduction: The Illusion of the Universal

It is a comforting assumption, held by both the layperson and the mathematician, that truth is static. We believe that $2 + 2 = 4$ is a statement of universal validity, independent of the ink it is written in, the mind that conceives it, or the culture that speaks it. We assume that mathematics is a "view from nowhere"—a Platonist realm of perfect forms where the base we count in or the symbols we use are merely neutral clothing for naked, invariant truths.

However, the history of science tells a more turbulent story. In his seminal 1962 work, *The Structure of Scientific Revolutions*, Thomas Kuhn dismantled the idea of scientific progress as a linear accumulation of knowledge. Kuhn argued that science operates within "paradigms"—distinct frameworks of concepts, methods, and assumptions. For long periods, scientists engage in "normal science," solving puzzles within the paradigm. But eventually, anomalies accumulate. The paradigm strains, cracks, and finally collapses, replaced by a new worldview in a "scientific revolution." Crucially, Kuhn noted that the old and new paradigms are often "incommensurable"—they speak different languages, and the scientist after a revolution essentially "works in a different world."

Yet, Kuhn's revolution remained largely sociological. He

lacked a formal mechanism to explain why these worlds were untranslatable. This essay proposes the **Geofinite-Kuhnian Conjecture**: a synthesis that grounds Kuhn's historical insight in the radical ontology of Geofinitism. We propose that a scientific paradigm is not merely a conceptual set, but an "Alphon"—a finite, physically instantiated symbolic system with a measurable geometric curvature. When paradigms shift, we are not just changing our minds; we are physically migrating to a new geometric substrate.

Foundational Principles: Geofinitism and the Alphon

To understand this conjecture, one must first engage with the "Scientific Philosophy" of Geofinitism. Its premise is stark: "I personally cannot measure a perfect infinite world on the basis of any proposed meaning of those words that must be formulated in finite symbols." This measurement-first epistemology asserts that all interaction with reality is mediated by finite resolution. Every ruler has a smallest graduation; every sensor has a noise floor.

In this view, the "continuum"—the idea of infinite divisibility—is a useful fiction, "a direction we point, not a place we can go." If the world is finite and measured, then the symbols we use to measure it are not abstract; they are

physical objects. This brings us to the Alphon.

An Alphon is a specific set of finite symbols, instantiated in a physical substrate, defined by its resolution limit (r_a) and its cost of distinction (ΔM). Geofinitism rejects the classical notion of "base invariance"—the idea that the number 13 is the same object whether written in decimal or binary.

In Base-14, the number 13 is a single symbol (a single "Nexil"), essentially a "Lone-Nexil Prime" occupying one geometric containment sphere. In Binary, the same magnitude is 1101—four Nexils, occupying four spheres, with a high "Spherical Symbolic Geometry Mean" (SGM) or curvature).

Because geometry is identity in this framework, these are not the same object. "Alphonic Primes" are not eternal truths but geometric configurations that resist decomposition within a specific Alphon. Thus, mathematics is not the study of abstract universals, but the study of finite symbolic configurations in physical substrates.

The Conjecture: Paradigms as Curved Spaces

The Geofinite-Kuhnian Conjecture bridges the gap between the sociological and the mathematical. It posits that a Kuhnian paradigm is, formally, an Alphon.

Normal Science is the manipulation of symbols (Nexils) within a stable Alphon. The "curvature" of the system is low enough that we can solve problems efficiently without redesigning the language. However, as we probe deeper into nature, we encounter Anomalies. In Geofinite terms, an anomaly is "Curvature Stress." It occurs when new measurements exceed the resolution limit (r_a) of the current Alphon, or when the cost of representing a phenomenon (ΔM) becomes physically unsustainable.

Consider the Ptolemaic geocentric model. To explain planetary motion, astronomers added epicycle upon epicycle. In Geofinite terms, they were forced to add more and more Nexils to the representation, spiking the curvature and the thermodynamic cost of the system. The "Crisis" Kuhn described is the moment the Alphon's geometry breaks down.

A Revolution, then, is Alphonic Replacement. We do not fix the old geometry; we discard it for a new one. The Copernican revolution was a shift to a lower-curvature Alphon where planetary motion could be represented with fewer Nexils.

This formalizes Kuhn's most puzzling concept: Incommensurability. Why can't we perfectly translate Newton to Einstein? Geofinitism provides a mathematical proof: There is no isomorphism between Alphons that preserves both volume and curvature. When we translate, we inevitably alter the geometric containment of the concept.

We are not describing the same world because we are not using the same geometry to contain it.

Case Study: The Trauma of 1971

This phenomenon is not limited to high physics; it is visible in the archaeology of culture. A profound "Alphonic Extinction" occurred in the United Kingdom on February 15, 1971, when the nation abandoned the £sd (pounds, shillings, pence) currency system for decimalisation.

The old £sd system was a mixed-radix Alphon (bases 12 and 20). While it seems archaic to modern eyes, it possessed a specific "human-scale" geometry optimized for trade. With 12 pence to a shilling, prices could be halved, thirded, and quartered without creating remainders. The cognitive geometry of the pre-1971 mind was one of clean, integer division.

The shift to a Decimal Alphon (base-10) was a move to a "flatter" representation for large calculations, but it introduced a new form of geometric violence: the irrational fraction. In base-10, a third of a pound is no longer a clean "6s 8d"—it is "33.33..." pence. The integer perfection was lost, replaced by a recurring decimal that must be truncated. This truncation—the "rounding error"—is the scar tissue where two incommensurable geometries met.

The "halfpenny rounding" rules and the redistribution

of prices were not just financial adjustments; they were the physical costs of an Alphonic shift. The trauma of that transition—the loss of the "shilling" as a unit of thought—demonstrates that when we change our measuring system, we change the "natural" categories of our reality. Even today, our language remains haunted by "Ghost Alphons"—we count "fingers" (implying base-10) when anatomy suggests fingers and thumbs might be base-8 or base-12.

Language as Geometry

The conjecture extends to language itself. If mathematics is the manipulation of symbols, and symbols are physical shapes, then the language we calculate in determines the geometry of our mathematics.

Consider the number "13" again. In Western notation, it is a linear string of two Nexils (1 and 3). In traditional Chinese, it is 十三 ("ten-three")—two characters, but each acts as a high-density logographic unit. The Chinese writing system represents a High-Alphon geometry: it uses a massive set of symbols ($A \approx 10,000$), resulting in lower representational curvature for complex concepts.

The word "tree" in English requires four containment spheres (t-r-e-e); the Chinese 树 requires only one. They occupy different volumes of physical space and require different neural energies to process. Thus, the "Pythagorean

Theorem" written in English and the same theorem written in Chinese are geometrically distinct objects. They may point to the same empirical outcome, but as mathematical entities, they possess different provenances, costs, and curvatures.

Mathematics is not language-independent; it is language-constituted.

Conclusion: The Emergent Truth of the Epoch

The Geofinite-Kuhnian Conjecture invites us to a place of profound epistemic humility. It suggests that mathematics is not a discovery of the eternal, but an "engineering of the epoch." We build structures of symbols to bridge the gap between our finite measurements and our need for prediction.

Kuhn showed us that science moves in cycles of crisis and renewal. Geofinitism reveals the mechanism: we are navigating a "curved manifold of possible symbol configurations." When the curvature becomes too steep—when our "truth" becomes too expensive to represent—we revolt. We invent a new Alphon.

We must conclude, then, that "base invariance" is indeed an illusion. Truth is not a static property of the universe, but the "emergent truth of the language of this epoch."

In a future epoch, with a quantum or biological Alphon we cannot yet imagine, our current constants and primes may dissolve into new, unrecognizable geometries.

This is not a loss of truth, but a recognition of our nature. We are finite beings, making finite marks in a finite world. And it is within those limits—within the specific curvature of our chosen Alphon—that we construct the universe we know.