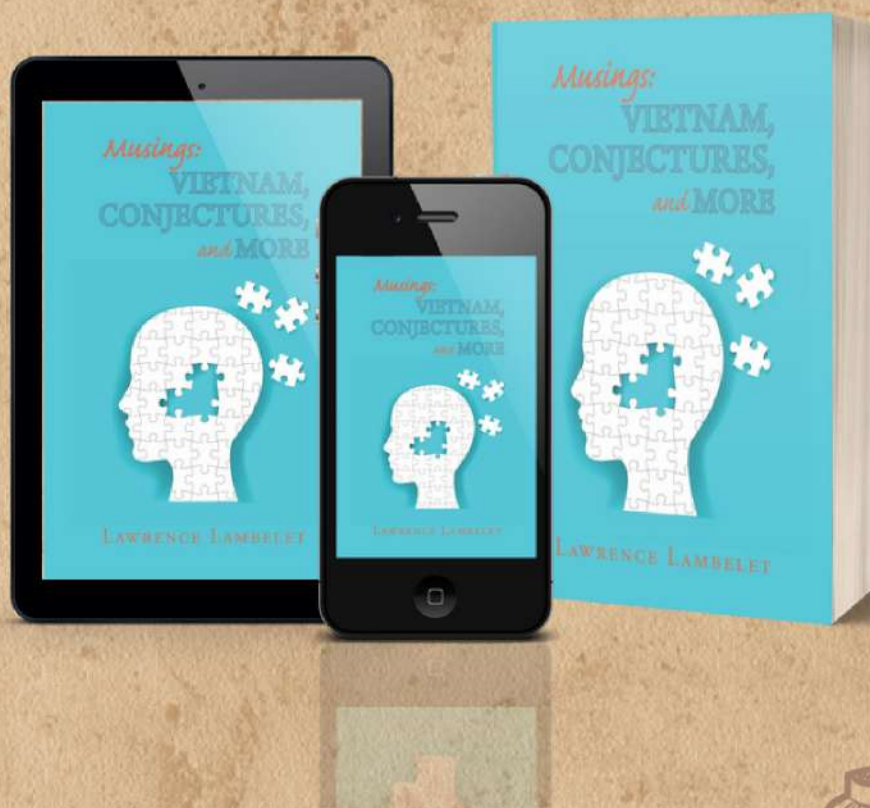


*Musings:*

**VIETNAM  
CONJECTURES  
*and* MORE**



**LAWRENCE LAMBELET**



# Comprehensive Synopsis

This work explores scientific, philosophical, and personal themes, offering insights into human identity, natural phenomena, and moral complexities. It critiques traditional calorie restriction, proposing intermittent fasting (IF) paired with aerobic exercise as a more effective and sustainable approach to health, aligning with natural cycles to encourage fat burning and cardiovascular benefits.

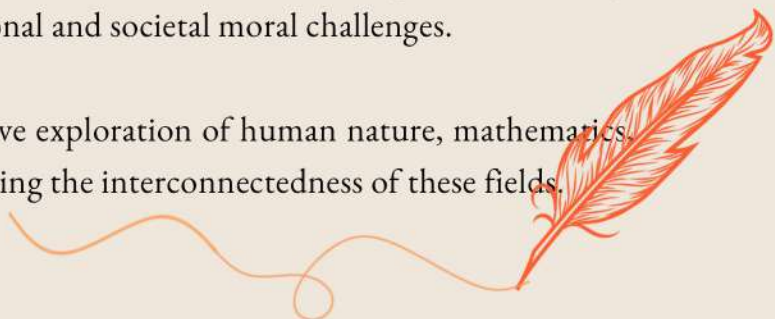
The Coriolis effect is examined in relation to wind turbine performance, suggesting that turbines should be designed based on geographic location for optimal efficiency, as wind deflection varies by hemisphere. The ABC Conjecture, involving coprime integers in the equation  $a + b = c$ , is explored, with the absence of a predictable formula potentially supporting its validity. The Four-Color Conjecture, asserting that four colors suffice to color any map, is discussed in relation to real-world issues like gerrymandering, despite its proof lacking intuitive insight.

Infinity is explored through Cantor's work, showing that infinities vary in size. His Diagonal Proof revolutionized mathematics but led to personal distress, demonstrating the profound impact of grappling with paradoxical ideas. Personal identity is reflected upon, shaped by growing up in Rolla, Missouri, and embracing a "Yankee" identity despite relocating to the South, illustrating how geography influences identity and culture.

The Vietnam War is revisited through leadership decisions by Presidents Johnson and Truman, emphasizing diplomacy and limited military objectives, with parallels drawn to modern conflicts like the war in Ukraine. The mind-body relationship and free will are examined through dualism and determinism, suggesting that free will may exist beyond physical determinism through higher cognitive processes, offering a nuanced understanding of human agency.

The connection between spirituality and morality is explored, asserting that emotional balance, moral integrity, and virtues like honesty and humility are key to spiritual well-being. Human morality, shaped by biology and culture, is discussed with an emphasis on civility, empathy, and spiritual growth to address personal and societal moral challenges.

In conclusion, this work offers a comprehensive exploration of human nature, mathematics, philosophy, and personal experience, highlighting the interconnectedness of these fields.



# Chapter Outlines

## Fast Fasting

Traditional dieting through continuous energy restriction (CER) often proves ineffective and unsustainable due to persistent hunger, psychological fatigue, and frequent weight regain. A more effective and biologically aligned alternative is intermittent fasting (IF), particularly when combined with aerobic exercise. IF mirrors the natural feast-and-famine rhythm of human evolution, encouraging the body to burn fat stores without the constant burden of calorie counting. Research indicates that IF yields weight loss results comparable to CER, while exercise enhances fat metabolism, suppresses appetite, and contributes to better cardiovascular health and potentially longer lifespan. A practical and sustainable approach may involve alternating fasting-exercise days with regular eating days, promoting both physical well-being and long-term habit formation.

## Does It Matter That Windmills Turn Clockwise?

The Coriolis effect, caused by Earth's rotation, influences wind turbine performance by altering the apparent direction of moving air—veering to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. While the direction of a clock's rotation is arbitrary and unaffected by such forces, wind turbines interact with atmospheric dynamics, especially at night when wind shear becomes more pronounced due to temperature stratification. This difference in wind speed between the top and bottom of a turbine can create a net rotational force that favors clockwise rotation in the Northern Hemisphere. In contrast, the same design may hinder performance in the Southern Hemisphere, suggesting that wind turbines should ideally be designed to rotate in the direction most compatible with their geographic location.





## Finding the ABC Conjecture

The ABC Conjecture, proposed by Joseph Oesterlé and David Masser in 1985, focuses on the equation  $a + b = c$  where  $a$ ,  $b$ , and  $c$  are coprime integers. It suggests that, in most cases,  $c$  is smaller than the radical of  $abc$  (the product of their distinct prime factors), with exceptions being rare and defined by a small  $\epsilon$ . The 2012 attempt by Shinichi Mochizuki to prove the conjecture using his complex inter-universal Teichmüller theory (IUT) has been met with skepticism, and despite Mochizuki's efforts, his proof has not been universally accepted. In 2023, businessman Nobuo Kawakami offered a \$1 million prize for finding a flaw in Mochizuki's proof. Instead of focusing on proving the conjecture, the author explores discovering exceptions by creating a matrix of potential values for  $a$  and  $b$ , hoping to find patterns that could lead to new insights into the conjecture.

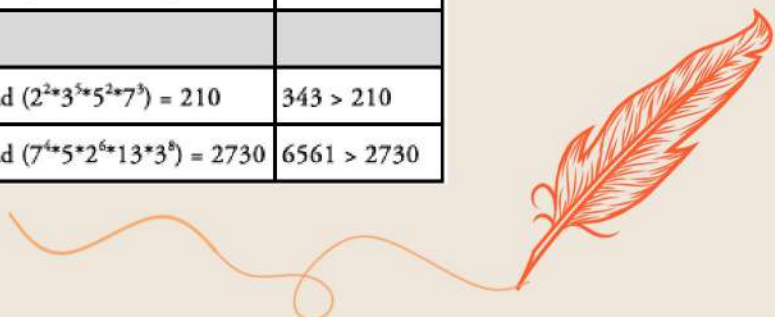
Screen	Rationale
Screen	Rationale
Any $c$ less than or equal to 30	The product of the three lowest prime numbers, i.e., 2, 3, and 5, is 30. No sum equal to or below that number could qualify as a candidate because $\text{rad}(abc)$ is not further reducible.
Any even $a$ or $b$ where the corresponding $c$ is also even	The coprime requirement limits each triple to only one prime, 2.
Any $a$ or $b$ factorable by 5 (ending in 5 or 0)	The coprime requirement limits each triple to only one prime, 5.
Any $c$ where $c < \text{rad}(a) \times 6$ or $c < \text{rad}(b) \times 6$	6 is the product of the smallest two prime factors, 2 and 3, and is, therefore, the minimum multiplier of the remaining two terms.
Any $c$ , which is itself a factorable or unfactorable prime, where the exponent of each factor is limited to 1	$\text{rad}(abc)$ necessarily has to be higher than $c$ because the $a$ and $b$ terms would add additional multipliers to an unreducible third term.



An investigation into the ABC conjecture systematically narrows down a set of 4,950 potential candidates by applying various filters, ultimately identifying 10 unique solutions. The process involves examining sums of powers of low prime numbers, such as 2, 3, 5, and 7, along with educated guesses based on numerical patterns. After eliminating invalid solutions that involve the number 1 (since 1 is not prime), the candidate list is refined further to reveal solutions that meet the conjecture's requirements. Despite extensive analysis, no predictable formula emerges, which the author suggests may actually support the conjecture's validity. The lack of a formulaic approach could serve as indirect evidence that the conjecture is true, providing proof by contradiction that endless solutions cannot be formulaically generated.

*Table of conjecture solutions*

$a + b = c$	$\text{rad}(abc)$	$c > \text{rad}(abc)$
$a + b^2 \ (1 \leq a, b \geq 100)$ :		
$1 + 8 = 9$	$\text{rad}(1 \cdot 2^3 \cdot 3^2) = 6$	$9 > 6$
$5 + 27 = 32$	$\text{rad}(5 \cdot 3^3 \cdot 2^5) = 30$	$32 > 30$
$1 + 48 = 49$	$\text{rad}(1 \cdot 2^4 \cdot 3 \cdot 7^2) = 42$	$49 > 42$
$32 + 49 = 81$	$\text{rad}(2^5 \cdot 7^2 \cdot 3^4) = 42$	$81 > 42$
$1 + 63 = 64$	$\text{rad}(1 \cdot 2^6 \cdot 3^2 \cdot 7) = 42$	$64 > 42$
$1 + 80 = 81$	$\text{rad}(1 \cdot 2^4 \cdot 3^4 \cdot 5) = 30$	$81 > 30$
$a^n + b^m \ (1 \leq n, m \geq 5)$ :		
$5 + 27 = 32$	$\text{rad}(5 \cdot 3^3 \cdot 2^5) = 30$	$32 > 30$
$125 + 3 = 128$	$\text{rad}(5^3 \cdot 3 \cdot 2^7) = 30$	$128 > 30$
$2 + 243 = 245$	$\text{rad}(2 \cdot 3^5 \cdot 5 \cdot 7^2) = 210$	$245 > 210$
$243 + 7 = 250$	$\text{rad}(3^5 \cdot 7 \cdot 5^3 \cdot 2) = 210$	$250 > 210$
$32 + 49 = 81$	$\text{rad}(2^5 \cdot 3^4 \cdot 7^2) = 42$	$81 > 42$
$32 + 343 = 375$	$\text{rad}(2^5 \cdot 3 \cdot 5^3 \cdot 7) = 210$	$375 > 210$
$625 + 343 = 968$	$\text{rad}(2^3 \cdot 5^4 \cdot 7^3 \cdot 11^2) = 770$	$968 > 770$
$16807 + 3 = 16810$	$\text{rad}(2 \cdot 3 \cdot 5 \cdot 7^5 \cdot 41^2) = 8610$	$16807 > 8610$
<i>educated guesses:</i>		
$100 + 243 = 343$	$\text{rad}(2^2 \cdot 3^5 \cdot 5^2 \cdot 7^3) = 210$	$343 > 210$
$2401 + 4160 = 6561$	$\text{rad}(7^4 \cdot 5 \cdot 2^6 \cdot 13 \cdot 3^8) = 2730$	$6561 > 2730$





## On the Four-Color Conjecture

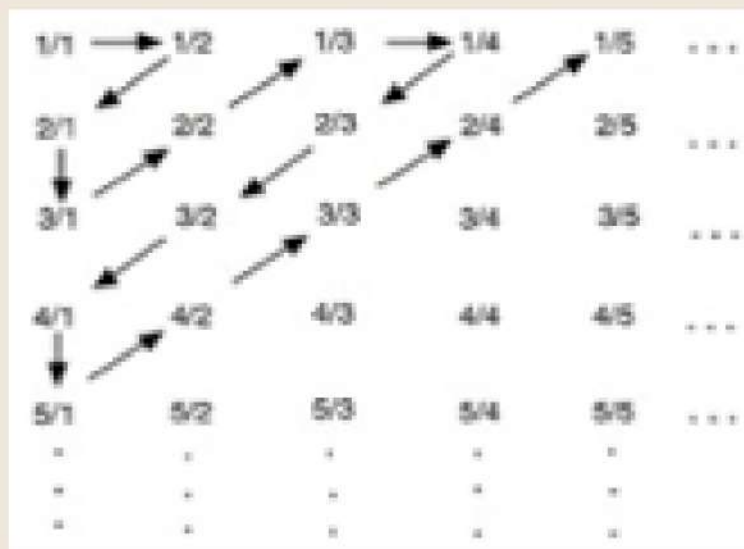
The Four-Color Conjecture suggests that only four colors are needed to ensure no two adjacent regions on a map share the same color. Inspired by his mapmaker father, the author explores the conjecture's history, beginning with a 19th-century student's observation and culminating in the 1970s computer-based proof by Wolfgang Haken and Kenneth Appel. While their proof was successful, it lacked intuitive insight, sparking ongoing debates in the mathematical community. The author presents a step-by-step protocol for coloring regions based on their surrounding territories, demonstrating that four colors are sufficient—even in complex cases like gerrymandering—while highlighting the conjecture's deceptively difficult nature and the ongoing search for a more rigorous, satisfying proof.

*Color map of the US*

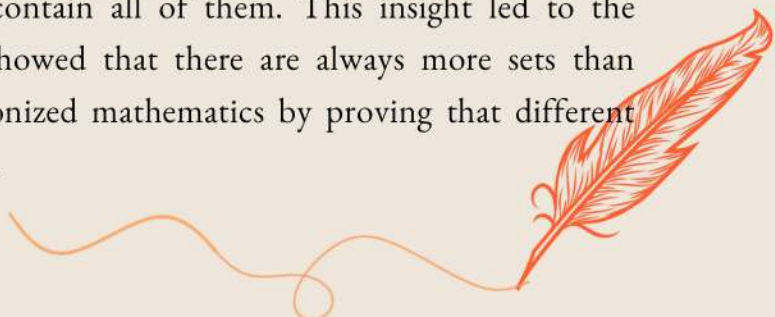


# Infinites, More or Less

The concept of infinity is explored, emphasizing its paradoxical nature and the fascination it has sparked in thinkers throughout history. The author recalls their intrigue with George Gamow's *One, Two, Three... Infinity*, which presents the idea that some infinities can be "larger" than others, despite infinity being endless by definition. This fascination is linked to the author's choice to study physics and an examination of how infinity manifests in our finite world, such as through time and irrational numbers like Pi and the square root of 2. The development of infinity is traced from ancient Greek philosophers to 19th-century mathematician Georg Cantor, who proved that infinities could be studied logically, showing, for example, that the set of fractions is not larger than the set of whole numbers. Cantor's discoveries, however, led him to claim divine inspiration and ultimately resulted in his life ending in a mental asylum, underscoring the complex and paradoxical nature of infinity.



Cantor's revolutionary discoveries about infinity are explored, starting with his surprising realization that the points in a two-dimensional plane can be paired one-to-one with points on a one-dimensional line, challenging our intuition about size in infinite sets. He extended this idea to show that there are as many points in all of space as there are on a line. Cantor's most famous contribution, however, is his Diagonal Proof, which demonstrated that the infinity of real numbers (the continuum) is greater than the infinity of whole numbers, by showing that no list of real numbers can contain all of them. This insight led to the development of set theory, where Cantor showed that there are always more sets than elements in any set, a concept that revolutionized mathematics by proving that different types of infinity exist, each with different sizes.





## North Versus South

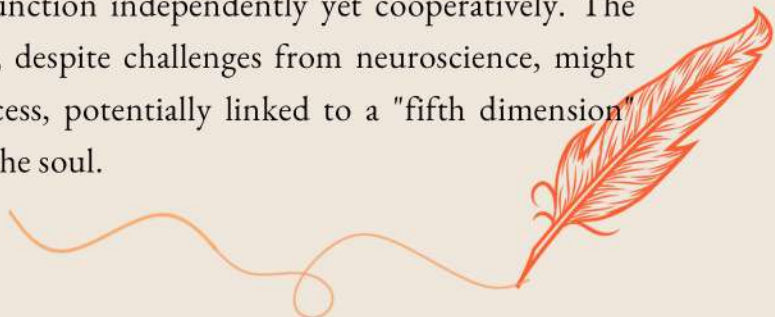
Growing up in Rolla, Missouri, a border state with a complex Civil War history, the search for identity was deeply influenced by the tension between the North and South. This personal quest is compared to similar regional divisions around the world, where geography shapes behavior and attitudes. Environmental factors, particularly temperature, are explored in terms of their impact on metabolism and perceptions of industriousness, challenging the stereotype that warmer climates foster laziness. In the end, the journey leads to reassurance in maintaining a "Yankee" identity despite relocating to the South, blending personal experience with broader cultural and biological insights.

## Was Vietnam a Mistake?

Personal experiences with the Vietnam War raise questions about whether it was a misguided conflict and invite an exploration of the broader implications of U.S. military interventions. The views on patriotism and authority of one generation are contrasted with those of younger generations, particularly the author's siblings, who were critical of the war. By drawing parallels between Vietnam and later conflicts, such as the war in Ukraine, the complexities of geopolitical decision-making are examined, with an emphasis on the importance of diplomacy and limited military objectives. Leadership decisions, particularly those of Presidents Lyndon B. Johnson and Harry Truman, are analyzed, with Johnson's escalation of the Vietnam War seen as a contrast to Truman's more measured approach focused on moral courage and limited objectives. Ultimately, the role of leadership character in shaping historical events and war decisions is underscored.

## In Defense of Free Wil

The exploration of dualism focuses on the mind-body connection and the concept of free will, contrasting traditional views of the mind and body as separate but causally linked with scientific perspectives of determinism, where actions are seen as predetermined by natural laws. Daniel Kahneman's work on fast, automatic thinking versus slow, reflective reasoning highlights the brain's dualistic nature, while Michael Gazzaniga's split-brain research demonstrates how the brain's hemispheres function independently yet cooperatively. The discussion raises the possibility that free will, despite challenges from neuroscience, might still exist through a top-down cognitive process, potentially linked to a "fifth dimension" beyond the brain's physical workings, akin to the soul.





## Healthy Spirit

The connection between spirituality, morality, and emotional balance is explored, highlighting that a high level of spirituality is often characterized by inner peace, positive regard for others, and emotional integrity. Achieving this state requires moral integrity, as violating moral impulses leads to self-criticism and diminished well-being. Jonathan Haidt's research is used to show that humans are born with an innate moral sense, shaped by both reason and emotion. Haidt's metaphor of an elephant (emotion) and its rider (reason) illustrates how emotions predominantly guide moral decisions, while reason often justifies them. The six foundational moral elements proposed by Haidt, rooted in the brain's emotional and reasoning systems, further emphasize that emotional balance and moral integrity are key to spirituality.

Foundation	Key Words	Politics	
		Left	Right
<i>Care/Harm</i>	children, motherhood, suffering, need, "cute"	X	x
<i>Fairness/Cheating</i>	equality, proportionality, partner for collaboration	X	X
<i>Loyalty/Betrayal</i>	teams (boys), 2-person relationships (girls)	x	X
<i>Authority/Subversion</i>	higher/lower rank, obedience, respect, status, behaving properly		X
<i>Sanctity/Degradation</i>	sanctity of life, body a temple, impurity, abortion (culture war)		X
<i>Liberty/Oppression</i>	bullies, tyrants, accumulation of wealth, underdog, victim		X

Human morality is shaped by both evolutionary biology and cultural influences, with socialization and group cohesion playing central roles in survival. Moral frameworks differ between liberals and conservatives, particularly in concepts like fairness, which vary based on political and cultural contexts. The psychological perspective on addiction recovery, as explored by Tom Legere, highlights the ego's defense mechanisms and the spiritual journey back to innocence. Virtues such as honesty, openness, and humility are emphasized as ways to foster spiritual health and recovery, in line with Haidt's moral foundations. The chapter also addresses societal addiction issues—ranging from substance abuse to political biases—and advocates for a return to civility, empathy, and spiritual growth to heal both personal and societal moral fabric.

