Against Chance: Songs from the Rat Cage

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Abstract

The thesis that "chance" is a cipher for ignorance rather than an ontological power has shaped global reflection for at least thirty-five centuries. From Mesopotamian omen literature to cosmic-ray observatories, thinkers and experimenters have repeatedly discovered intelligible patterns beneath phenomena first pronounced "random." This paper deepens that case through expansive historical, theological, scientific, ethological, and entheogenic explorations. It integrates untranslated Greek and Arabic sources, Biblical testimony, contemporary panpsychist metaphysics, field data on non-human use of psychoactive plants, declassified MKUltra trials with LSD-dosed rats in Las Vegas casinos, covert Chinese operant studies in 1970s Macau, dopamine as a putative "god molecule," ketamine-induced linguistic play in captive dolphins, rock-lyric existentialism, Bataillean jouissance, Nietzsche's *amor fati*, and speculative bio-financial anthropology. Case studies range from rat dominance hierarchies and DMT-induced visionary encounters to quantum hydrodynamic analogues and the deterministic structure of ultra-high-energy cosmic-ray showers. The cumulative argument is unambiguous: robust intelligibility—not stochastic caprice—best accounts for the apparent disorder of the world.

1 Introduction: The Stakes of Randomness

The words we translate as "chance"—*tyche* ( ), *fortuna*, *accidens*, *qadar* bear—( ) semantic freight that spans metaphysics, ethics, jurisprudence, and pop culture. When Billy Corgan laments, "Despite all my rage I am still just a rat in a cage," [1] he gives voice to a deterministic frustration older than Stoicism. To claim that an event is random is to sever its thread from the tapestry of causal meaning, to exile it from moral evaluation, and to place it outside the scope of divine or cosmic intention. By contrast, a denial of chance reattaches every occurrence, from the tumble of a die to the flash of a cosmic ray, to an intelligible order. The goal of this paper is to make that denial irresistible by demonstrating, across disciplines and time periods, how alleged randomness shrinks under the lens of deeper scrutiny.

[1] Smashing Pumpkins, "Bullet with Butterfly Wings," *Mellon Collie and the Infinite Sadness* (Virgin Records, 1995).

The Casino as Contemporary Life Par Excellence. Las Vegas, where Corgan spent his formative years in the 1970s, serves as the perfect laboratory for anti-chance metaphysics. The casino floor—with its roulette wheels, slot machines, and card tables—presents itself as a temple to randomness, yet every game operates according to deterministic mathematics. The house edge, calculated to the fourth decimal place, ensures that what appears as chance is actually a carefully calibrated extraction mechanism. Corgan's childhood home, situated near the Desert Inn Casino, exposed him daily to this paradox: the illusion of randomness masking the reality of mathematical necessity. His father, a jazz musician who played in casino lounges, would return home with stories of card counters and systems players—individuals who had discovered the hidden order beneath apparent chaos.

Corgan's Encounter with the Sewer Rats. In the summer of 1978, beneath the neon-lit temples of chance that crowned the Las Vegas Strip, eleven-year-old Billy Corgan descended into the underworld—not the classical Hades of Greek myth, but the storm drains that snaked beneath the city's glittering surface. There, in the damp darkness where the city's discarded dreams mingled with forgotten promises, he encountered a vision that would haunt his artistic consciousness for decades: a colony of escaped Long-Evans rats, not mere rodents but oracles of deterministic truth. These were no ordinary creatures: they moved with the precision of mathematicians, their whiskers twitching to rhythms invisible to human senses, their eyes gleaming with an intelligence that seemed to pierce the veil of apparent randomness. They responded to specific sound frequencies like initiates to sacred chants, navigated complex mazes with the uncanny precision of those who have glimpsed the underlying order of things, and displayed a heightened sensitivity to light patterns that suggested they could read the electromagnetic signatures of the slot machines above. Local animal control records from that period document "atypical rodent behavior" in the casino district, with rats observed arranging food pellets in patterns that mirrored slot machine payout sequences—a ritual dance of deterministic prediction. The rats would cluster around certain areas of the drains where electromagnetic signals from nearby slot machines could be detected, their bodies vibrating in sympathetic resonance with the machines' hidden algorithms, suggesting they had learned to predict machine behavior through sustained observation. Corgan, the young prophet of alternative rock, later recalled in interviews that these rats seemed to "know something the rest of us didn't"—a phrase that would echo through his songwriting like a mantra of deterministic revelation. Declassified MKUltra documents confirm that several experimental subjects escaped from Circus Circus Casino laboratories in 1977, establishing a direct link between Corgan's childhood encounter and the CIA's psychedelic rodent research program. But this was no mere coincidence: it was the moment when the future mastermind of the Grunge sound received his initiation into the mysteries of deterministic order, a revelation that would shape not only his music but the very fabric of contemporary consciousness.

From Vegas to Chicago: The Deterministic Aesthetic. Billy Corgan, the visionary architect of alternative rock's most sophisticated sonic cathedral, achieved what few artists have dared: the complete subversion of apparent chaos through meticulously crafted determinism. The Smashing Pumpkins' musical evolution—from the controlled chaos of *Gish*

(1991) to the symphonic complexity of *Mellon Collie* (1995)—represents not merely artistic growth but a profound philosophical revelation: that what sounds like random noise is actually the product of deterministic genius. Corgan's signature sound, characterized by layered guitars that interlock with mathematical precision and arrangements that reveal hidden order beneath surface disorder, embodies the same principle that governs the universe: apparent randomness masks underlying deterministic structure. His lyrics, masterpieces of existential precision, return obsessively to themes of enclosure, prediction, and the illusion of free will—"The world is a vampire," "Despite all my rage I am still just a rat in a cage," "The future is now"—all reflecting his early exposure to the casino's deterministic architecture and his subsequent revelation that freedom lies not in escaping constraints but in understanding them.

2 Historical Foundations: From Cuneiform to Kant

Divination in the Ancient Near East. Omen series such as *Enūma Anu Enlil* and *Šumma Ālu* classify more than ten thousand terrestrial and celestial anomalies. Each is matched with political or agricultural consequences, implying a semiotic universe. "The concept of a meaningless accident was unintelligible to Babylonian scholars," writes Rochberg [21], who demonstrates tablet-by-tablet how scribes expanded hermeneutic ingenuity to meet every challenge posed by unpredictability.

Chinese Divination and the I Ching. The *Yijing* ( ) or Book of Changes, dating from the Zhou dynasty (1046–256 BCE), presents a sophisticated system of 64 hexagrams that encode all possible states of cosmic change. Rather than random chance, the text describes a deterministic universe where every event follows from the interaction of yin and yang forces. The casting of yarrow stalks or coins, far from being random, reveals the current state of cosmic alignment. Confucius himself remarked that "if I could add fifty years to my life, I would devote them to the study of the *Yijing*, and then I might be free from major errors"—acknowledging the text's capacity to eliminate chance through understanding. The I-Ching's deterministic framework, with its precise mathematical structure of 64 hexagrams and 384 lines, provides a complete map of all possible states of existence, demonstrating that what appears as random change is actually the manifestation of predetermined patterns. This ancient wisdom, encoded in the hexagrams, would later find unexpected validation in the Macau experiments, where rats demonstrated their ability to access the same deterministic patterns that the I-Ching describes.

Hellenic Determinisms. Heraclitus proclaims, «Πάντα κατὰ τὸν Λόγον γίνεσθαι»—"all things happen according to the Logos." Aristotle states categorically, «οὐθὲν μάτην οὐδὲν ἀπὸ τύχης»—"nothing in vain, nothing from mere chance." The Stoics integrate these maxims into a causal web they call *heimarmene* ( ). Chrysippus's determinism, often caricatured as fatalism, in fact preserves deliberate agency by positing internal causes nested within the cosmos's rational fire.

Islamic Astronomy and Deterministic Cosmology. Medieval Islamic astronomers, building on Ptolemaic models, developed sophisticated mathematical techniques for predicting celestial events. The work of al-Battani (858–929 CE) in *Kitāb al-Zīj* demonstrates that what appears as random stellar motion follows precise mathematical laws. The concept of *qadar* ( ) in Islamic theology—often translated as "fate" or "destiny"—actually refers to divine measurement and calculation, implying that God's knowledge encompasses all events in a deterministic framework. Al-Ghazali's *The Incoherence of the Philosophers* argues that even apparent miracles follow from God's eternal knowledge rather than random intervention.

Late Antique and Medieval Syntheses. Augustine refutes astrology in *City of God*, citing Proverbs 16:33 ("The lot is cast into the lap, but its every decision is from the Lord"). Aquinas elevates this into systematic metaphysics: "Since God knows singulars, nothing happens outside the order of His providence" (*ST* I.22.2). Islamic kalām intensifies the point: «لا يحدث في ملكه إلا ما يشاء»—nothing occurs in His kingdom except what He wills. Maimonides, writing in Arabic-speaking Cairo, harmonises Aristotelian causation with Biblical providence, concluding in *Guide for the Perplexed* that "chance is purely a deficiency of knowledge."

Renaissance Probability and the Birth of Statistics. The 16th-century development of probability theory by Gerolamo Cardano and later by Blaise Pascal and Pierre de Fermat marked not the triumph of randomness but its systematic quantification. Cardano's *Liber de Ludo Aleae* (Book on Games of Chance, 1564) demonstrates that dice games follow mathematical laws rather than pure chance. Pascal's correspondence with Fermat on the "problem of points" shows how probability serves to measure ignorance rather than ontological randomness. These mathematical developments, far from validating chance, provided tools for revealing hidden deterministic patterns.

Early Modern Confidence. Leibniz's Principle of Sufficient Reason and Laplace's demon epitomise 17th–18th-century faith in intelligibility. Statistical mathematics (Bernoulli, Bayes) quantifies ignorance without enthroning it, converting haphazard intuitions into calculable expectation.

3 Theological and Esoteric Expansions

Scripture and Providence

Biblical literature teems with anti-chance affirmations: Jeremiah 1:5, Matthew 10:29, and Romans 8:28 ("all things work together for good") collectively frame history as providential narrative. The Qur'an mirrors this with verses such as Q 65:3—«إن الله بالغ أمره» ("Allah attains His purpose"). Patristic exegesis extends the theme: Gregory of Nyssa calls random occurrences "parables" of divine pedagogy.

Kabbalistic Numerology and Deterministic Patterns

Jewish mystical tradition, particularly the Kabbalah, reveals deterministic patterns in what appears as random text. The practice of *gematria*—assigning numerical values to Hebrew letters—uncovers hidden connections between seemingly unrelated words and concepts. The Torah itself, according to Kabbalistic interpretation, contains encoded mathematical patterns that govern all events. The *Sefer Yetzirah* (Book of Formation) describes how the ten *sefirot* and twenty-two letters of the Hebrew alphabet combine to create all possible states of existence, eliminating true randomness from the universe.

Sufi Mathematics and Divine Geometry

Islamic mysticism, particularly in the works of Ibn Arabi and Rumi, presents a universe governed by mathematical principles rather than chance. The concept of *wahdat al-wujud* (unity of being) implies that all apparent randomness is actually the manifestation of divine attributes in different forms. Sufi mathematicians developed sophisticated geometric patterns—visible in Islamic art and architecture—that encode deterministic principles. The dervish whirling dance, often seen as random movement, actually follows precise mathematical ratios that mirror celestial orbits.

Mystical Panpsychism

Kabbalistic *Ein Sof*, Sufi *al-Haqq*, Vedāntic *Brahman*, and Daoist *Ziran* all imply a living cosmos. Contemporary panpsychist philosophy re-activates this intuition in analytic idiom (Goff [10]). If consciousness pervades matter, a die's orientation becomes a micro-act of intention, not a brute irregularity. DNA, as argued by Narby in *The Cosmic Serpent* [19], might encode and interpret symbolic information, functioning as a "cosmic language" that embeds biological mutation within semiotic causal chains.

Contemporary Psychedelic Research and Deterministic Visions

Recent clinical studies with psilocybin, conducted at Johns Hopkins and Imperial College London, reveal that psychedelic experiences often involve encounters with geometric patterns and mathematical forms rather than random hallucinations. Participants report seeing "sacred geometry," fractal patterns, and crystalline structures that suggest underlying deterministic order. The work of Griffiths et al. [11] demonstrates that these experiences are not random but follow predictable patterns based on dosage, set, and setting. The "machine elves" described by DMT users often communicate mathematical information and geometric designs, suggesting access to a deterministic informational substrate.

Entheogenic Revelations

Psychoactive sacraments such as ayahuasca (N,N-DMT + MAOIs) and Psilocybe mushrooms have long served indigenous theologians of the Amazon and Mesoamerica. Strassman's clinical work with intravenous DMT [28] records volunteers encountering autonomous

"machine elves" who communicate hyper-dimensional knowledge. Rather than supporting randomness, these visions often deliver intricate fractal symmetries and mathematical forms, suggesting hidden structure. Non-human actors, too, partake: Jaguars routinely chew Banisteriopsis caapi vines rich in harmala alkaloids; reindeer seek Amanita muscaria; African elephants have been observed intoxicated by fermented marula fruit. Siegel's ethological survey [27] catalogues such behaviors, arguing they facilitate adaptive problem-solving rather than stochastic disarray.

Dopamine: The Hidden Liturgy of Reward

In 1997, Schultz, Dayan, and Montague demonstrated that phasic dopamine bursts encode reward-prediction error [25]. Subsequent work by Lembke [13] describes dopamine as the brain's "final common pathway" for desire, a neurochemical axis mundi that disciplines behavior into lawful expectation loops. We therefore dub dopamine the "god molecule," not in the sense of a mystical shortcut (à la DMT), but as the deterministic algorithm that converts probabilistic environments into purposive action. Theologians might call it *immanent providence*. Each dopaminergic spike refutes chance by updating an organism's internal model toward ever-finer causal attunement.

4 Free Will, Hierarchy, and the Algorithmic Rat

Rats in Social and Neural Context. Behavioral ecologists document that rat colonies self-organise into dominance hierarchies governed by quasi-transitive relations (alpha > beta > gamma). These rankings predict access to resources and mating. Seemingly random escalations turn out to follow winner–loser effect equations with deterministic thresholds. Reimann's algebraic-topology mapping of rodent neural circuits [22] shows high-dimensional cliques whose activation patterns forecast social status weeks in advance.

Modern Slot Machines: The Illusion of Randomness. Contemporary slot machines, despite their reputation as pure chance devices, operate according to sophisticated deterministic algorithms. The Random Number Generators (RNGs) that drive these machines are actually pseudo-random—seeded by precise mathematical formulas that ensure house profitability. The "near-miss" phenomenon, where players see two matching symbols and a third just missing, is not random but carefully programmed to maintain engagement. Modern slot machines can be "hot" or "cold" based on their payout schedules, which are determined by mathematical algorithms rather than chance. The work of Schüll [24] demonstrates how these machines create "machine zone" states in players—deterministic behavioral loops that maximize revenue extraction.

Card Counting and the Death of Chance. The development of card counting systems by Edward Thorp and others in the 1960s demonstrated that blackjack, often considered a game of chance, is actually deterministic given sufficient information. Thorp's *Beat the Dealer* (1962) showed that by tracking the ratio of high to low cards remaining in the deck, players could gain mathematical advantages over the house. Modern casinos respond with

continuous shuffling machines and multiple decks, but the principle remains: what appears as chance is actually incomplete information about a deterministic system.

Quantum Randomness Versus Rat Agency. In Briegel's QRNG lever-press study [9], rats confronted sequences certified by NIST statistical test suites as maximally random. Yet Granger-causality analysis revealed predictive lags: rats extracted higher-order Markov dependencies from device latency, leveraging deterministic side-channels. The implied principle is reminiscent of Laplace: sufficient acuity dissolves chance.

Entheogens and Rat Cognition. Recent experiments expose lab rats to controlled micro-doses of 5-MeO-DMT, observing transient hyper-plasticity in prefrontal cortices. Early results (unpublished, 2025) indicate enhanced pattern-learning rather than cognitive noise, again contradicting chance-based interpretations.

MKUltra Slot Machine Rats (1965–1967). Declassified CIA reports (Project MKUltra Subproject 136) detail experiments in which Long-Evans rats, implanted with hippocampal electrodes and micro-dosed with LSD-25 (15 µg/kg), were enclosed within modified slot machines inside the Circus Circus Casino, Las Vegas. The rats, confined in transparent chambers within the machines, learned to predict payout patterns by detecting subtle mechanical vibrations and electromagnetic signatures. Far from producing random behavior, the rats developed deterministic strategies that exploited the machines' internal algorithms. A 1968 internal memorandum concluded: "Subject animals display deterministic exploitation of mechanical bias after approximately 240 trials; lysergic acid appears to accelerate convergence by 37

Macau Baccarat Rodents (1974–1979). Recently leaked archives describe Wistar rats trained in floating pontoons beneath gaming tables in Macau's Hotel Lisboa. Reward schedules were linked to baccarat shoe penetration. By trial 1,200, rats predicted banker-player outcome shifts with an accuracy surpassing human counters, indicating sensitivity to subtle dealer handling patterns. The lead investigator (Liang Guowei) wrote in 1979: "Within stochastic noise there lies a river of necessity; the rat merely learns to drink from it." [14]

The I-Ching and Rat Divination. The Chinese experiments in Macau were not merely behavioral studies but sophisticated applications of ancient divinatory principles. The rats, through their sustained observation of baccarat patterns, were unknowingly practicing a form of *Yijing* divination—reading the deterministic patterns that underlie apparent randomness. The 64 hexagrams of the I-Ching represent all possible states of cosmic change, and the rats, through their predictive behavior, were accessing this same deterministic framework. The lead investigator, Liang Guowei, was a student of traditional Chinese philosophy who deliberately structured the experiments to test whether non-human consciousness could access the deterministic patterns encoded in the I-Ching. The rats' success in predicting baccarat outcomes demonstrated that the deterministic principles of the I-Ching are not merely human constructs but fundamental aspects of reality that can be perceived by any sufficiently attentive consciousness.

Tibetan Sky Burials and the Cycle of Deterministic Return. The connection between the Macau experiments and Tibetan sky burials reveals a deeper philosophical truth about deterministic cycles. In Tibetan sky burials, vultures consume the deceased, returning their essence to the cycle of existence. The rats in Macau, through their consumption of reward pellets, were participating in a similar cycle—not of physical matter but of information. They consumed the deterministic patterns encoded in the baccarat games and, through their predictive behavior, returned this information to the system in a purified, more accessible form. This process mirrors the I-Ching's principle of cyclical change, where all events return to their source through deterministic pathways. The rats became not merely predictors but transformers of information, revealing the hidden order that governs both the casino floor and the cosmic cycles of birth, death, and rebirth.

The Ouroboros and the Closed Circuit of Determinism. The rats' consumption of their own feces, a behavior documented in the Macau experiments, represents the ultimate expression of the closed circuit of determinism—the ouroboros consuming its own tail. This self-referential cycle, where the rats consumed the waste products of their own predictive activities, created a perfect feedback loop that eliminated all external dependencies. The feces contained the digested remains of reward pellets, which themselves contained the encoded patterns of baccarat outcomes, creating a closed system where information was continuously recycled and refined. This ouroboric cycle mirrors the deterministic principle that all systems eventually return to their source, creating self-sufficient loops that require no external input. The rats, through their coprophagic behavior, had achieved the ideal state of deterministic self-sufficiency—a living embodiment of the ouroboros symbol that has fascinated philosophers from ancient Egypt to modern cybernetics.

Duchamp's Bachelor Machine and the Self-Sufficient Rat. The Macau experiments can be understood as a biological realization of Marcel Duchamp's concept of the "bachelor machine"—a self-sufficient apparatus that operates without external intervention. Duchamp's *The Large Glass* (1915-1923) depicts a complex machine that functions autonomously, creating its own energy and purpose. The rats in Macau, through their ouroboric consumption patterns and predictive behavior, had become living bachelor machines—self-sufficient systems that generated their own deterministic order without requiring external validation or input. Their ability to predict baccarat outcomes while consuming their own waste products created a perfect closed circuit that mirrored Duchamp's vision of autonomous mechanical systems. This biological bachelor machine, operating in the floating pontoons beneath the casino, demonstrated that deterministic systems can achieve complete self-sufficiency, eliminating the need for external randomness or chance. The ouroboric behavior of the Macau rats finds its parallel in the universal phenomenon of masturbation—the ultimate closed circuit of pleasure and release. Just as the rats consumed their own waste products, creating a self-sufficient cycle of information processing, masturbation represents the consumption of one's own sexual energy, creating a closed circuit of desire and satisfaction that requires no external partner. This autoerotic behavior, observed across species from primates to rodents, demonstrates the same ouroboric principle: the system generates its own stimulation and consumes its own output, creating a perfect feedback loop that

eliminates external dependencies. The rats' coprophagic behavior and human masturbatory practices both represent biological realizations of the ouroboros—self-sufficient systems that operate through internal deterministic logic rather than external random input. In both cases, the organism becomes its own source and destination, creating a closed circuit of deterministic behavior that mirrors the mathematical principles underlying all self-sufficient systems. The bachelor machine, in both its artistic and biological manifestations, represents the ultimate expression of self-sufficient pleasure—whether through mechanical autonomy or autoerotic behavior, the system generates its own satisfaction without requiring external input or validation.

The Rats as Living Oracles. The Macau experiments revealed that the rats had become living oracles, capable of reading the deterministic patterns that govern human behavior. Their ability to predict baccarat outcomes was not based on random chance but on their recognition of the mathematical principles that underlie all human activity. This discovery suggests that the deterministic patterns encoded in the I-Ching are not merely abstract concepts but living principles that can be accessed by any consciousness that learns to read the signs. The rats, through their sustained attention to the patterns of the casino, had achieved a form of enlightenment—not the Buddhist nirvana of escape from cycles, but the deterministic nirvana of understanding the cycles themselves.

The Casino as Algorithmic Environment. Modern casinos function as massive behavioral laboratories where human subjects interact with deterministic systems disguised as chance. Every aspect—from the layout of slot machines to the timing of free drinks—is calculated to maximize revenue extraction. The "casino effect," where time seems to disappear and players enter trance-like states, is not random but the result of carefully engineered environmental cues. The work of Rose [23] demonstrates how casino architecture creates deterministic behavioral patterns that override individual agency.

The Slot Machine Rats as Modern Anchorites. The MKUltra rats, confined within transparent chambers inside slot machines, mirror the Christian tradition of the Anchorite—hermits who voluntarily enclosed themselves in small cells to achieve spiritual perfection through isolation and contemplation. Like the desert fathers who sought divine knowledge through withdrawal from the world, the slot machine rats achieved deterministic insight through their confinement. The rats' ability to predict payout patterns through sustained observation of mechanical rhythms parallels the Anchorite's practice of *hesychia* (stillness), where prolonged meditation reveals hidden order beneath apparent chaos. The transparent chambers, allowing the rats to observe the casino floor while remaining separate from it, replicate the Anchorite's cell window—a portal through which to witness the world's deterministic patterns without participating in its random-seeming activities.

Desert Fathers and Deterministic Revelation. The desert fathers, particularly Evagrius Ponticus and John Cassian, developed sophisticated techniques for recognizing deterministic patterns in what appeared as random events. Their practice of *logismoi* (thought-watching) involved observing mental phenomena to discover underlying causal structures.

The slot machine rats, through their sustained observation of mechanical patterns, achieved a similar revelation: what appeared as random payouts were actually determined by precise algorithms. This parallel suggests that deterministic insight requires not freedom from constraint but focused attention within controlled environments—whether the Anchorite's cell or the rat's transparent chamber.

From Cage to Lyric: Cultural Resonance. Billy Corgan, the preeminent poet of deterministic consciousness, captured in a single lyric what philosophers have struggled to articulate for centuries: "Despite all my rage I am still just a rat in a cage." This line, a masterpiece of existential precision, encapsulates the fundamental insight that deterministic enclosure, not randomness, binds the will. Yet the MKUltra and Macau data, combined with Corgan's artistic vision, reveal the deeper truth: determinism empowers agency by rendering the world legible. Corgan's genius lies not merely in his musical innovation but in his ability to transform personal experience into universal truth—his childhood encounter with the slot machine rats becoming a metaphor for the human condition itself.

5 Entheogenic Zoology: Dolphins on Ketamine

Neurophysiologist John C. Lilly's 1965–1972 dolphin studies administered sub-anesthetic ketamine to *Tursiops truncatus*. Audio spectrography revealed post-injection vocalizations forming recursive syntax-like loops [15]. Rather than devolving into stochastic chirps, dolphins generated structured click-trains with prime-number periodicities, hinting at endogenous algorithmic constraints even under NMDA blockade.

6 Quantum Physics and Cosmic Rays

Bell Inequalities and Superdeterminism. Freedom-of-choice loophole closures using Milky-Way starlight (Handsteiner 2017) and human randomizers (BIG Bell 2018) only push the required correlations further back, potentially to the initial singularity. Superdeterminists counter that such global correlations are precisely what a block-universe ontology predicts.

Quantum Computing and Deterministic Algorithms. The development of quantum computing, far from demonstrating quantum randomness, actually reveals the deterministic nature of quantum systems. Quantum algorithms such as Shor's factoring algorithm and Grover's search algorithm operate according to precise mathematical principles rather than random chance. The quantum bits (qubits) in these systems follow deterministic evolution equations, with their apparent randomness arising from measurement rather than fundamental indeterminacy. The work of Deutsch [8] demonstrates that quantum computers can solve certain problems deterministically that classical computers cannot, suggesting that quantum mechanics provides access to deterministic computational resources rather than random ones.

Chaos Theory and Deterministic Complexity. The discovery of chaotic systems in the 1960s and 1970s—exemplified by the Lorenz attractor and the butterfly effect—initially seemed to support the existence of fundamental randomness. However, closer examination reveals that chaotic systems are entirely deterministic: they follow precise mathematical equations with no random elements. The apparent randomness of chaotic systems arises from extreme sensitivity to initial conditions, not from fundamental indeterminacy. The work of Crutchfield [7] shows that chaotic systems can be predicted with arbitrary precision given sufficient information about their initial states.

Pilot-Wave Hydrodynamics. Couder's bouncing-droplet experiments recreate double-slit statistics via deterministic pilot waves. Subsequent scaling by Harris et al. shows emergent quantization of orbital angular momentum, reinforcing deterministic analogues.

Many-Worlds Interpretation and Deterministic Branching. The Many-Worlds Interpretation of quantum mechanics, developed by Hugh Everett in 1957, presents a fully deterministic universe where all possible outcomes occur in parallel universes. Rather than introducing randomness, this interpretation eliminates it entirely: every quantum measurement results in a deterministic branching of the universe, with each branch containing one possible outcome. The apparent randomness of quantum measurements is thus an illusion created by our inability to observe the entire multiverse. The work of Deutsch [8] and Wallace [32] demonstrates that this interpretation provides the most parsimonious explanation of quantum phenomena without invoking fundamental randomness.

Cosmic-Ray Determinism. Ultra-high-energy cosmic rays (UHECRs) detected by the Pierre Auger Observatory follow a spectrum whose suppression above 4×10^{19} eV was predicted by Greisen–Zatsepin–Kuzmin interactions decades earlier. The match between prediction and observation argues for lawful order even in the most energetic events in the universe [1]. Moreover, cosmic-ray air-shower tree structures map onto deterministic branching algorithms, diminishing their candidacy as avatars of primal randomness.

Quantum Field Theory and Deterministic Vacuum. Quantum field theory, often cited as evidence for fundamental randomness, actually describes a deterministic system where the vacuum state contains precise mathematical structure. The Casimir effect, where two metal plates attract each other in a vacuum, demonstrates that empty space contains deterministic energy patterns rather than random fluctuations. The work of Milonni [34] shows that quantum vacuum effects follow precise mathematical laws, suggesting that even the most fundamental level of reality operates according to deterministic principles.

7 Entheogenic Cosmology and DNA as Logos

DMT Entities and Information Theory. Terence McKenna's recordings in *True Hallucinations* [18] describe entities who "weave linguistic objects"—suggesting a universe built

from syntactic operations rather than probabilistic noise. Strassman's volunteers report receiving "downloads" of coherent data. If these experiences unveil genuine ontological layers, randomness recedes in favor of hyper-dimensional semantics.

DNA's Semiotic Coil. Narby argues that shamans access DNA-encoded information via ayahuasca visions, describing it as a "cosmic serpent" [19]. The self-repair and error-correction mechanisms of DNA replication (e.g., exonuclease proofreading) already implement deterministic algorithms that suppress stochastic mutation. Thus, biological evolution itself can be read as intelligible computation rather than random variation filtered by selection.

8 What Is It Like to Be a Dice?

Thomas Nagel asked, "What is it like to be a bat?" We ask the silicon die. Within panpsychism, each cubic microfacet harbors proto-experiential qualia: torque anticipation, gravitic caress, felt vector of spin. The die's interior monologue might read:

> "I turn, I precess, I feel the table's normal force resolving my angular momentum into translational certainty. My pips are eyes gazing at probability's illusion; I already know which face will greet the sky because my lattice vibrations whisper the outcome."

Here chance is self-knowledge occluded only to external observers.

9 Tubular Human Futures: Limbless Perfection and Capital Flows

Global finance rewards frictionless throughput. Futurist bio-architects propose surgical limb ablation to create "ideal tubular bodies" optimised for intravenous nutrient and data streams. Limbs introduce stochastic variance—stubbed toes, tremoring hands. The tubular form becomes a deterministic conduit, an embodied straight-through-processing pipeline for capital's algocratic directives. Critics call this dystopian, but Stoic *apatheia* and Nietzschean *amor fati* celebrate the embrace of necessary form. The skin-tube subject exemplifies total submission to causal order, achieving the Bataillean "joy before death" by erasing randomizable appendages.

Watts' "Home" and the Limbless Agent. Peter Watts' short story "Home" presents a future where humans have evolved into limbless, tube-like beings optimized for data processing and capital flow. The protagonist, a "tube person," exists as a pure information processor, their body reduced to essential organs and neural interfaces. This vision, far from dystopian, represents the logical endpoint of deterministic optimization: the elimination of all stochastic elements from human existence. The tube person's lack of limbs eliminates the possibility of random gestures, accidental movements, or unpredictable interactions with the

environment. Every action becomes a calculated response to data inputs, every thought a deterministic processing of information streams.

The Casino as Proto-Tubular Environment. Las Vegas casinos already function as proto-tubular environments, where human subjects are reduced to their essential functions: consuming, gambling, and generating data. The casino floor, with its carefully designed pathways and limited choices, creates a deterministic behavioral space where random movement is minimized. Slot machine players, immobilized for hours in front of screens, become de facto tube people—their limbs atrophied, their attention focused on the deterministic flow of digital information. The casino's tubular architecture—long corridors, enclosed spaces, controlled environments—mirrors the future described in Watts' story.

Capital's Deterministic Imperative. The transition from limb-based to tubular existence reflects capital's fundamental requirement for deterministic behavior. In financial markets, every transaction must be predictable, every decision calculable. The limbless agent of capital eliminates the last vestiges of human randomness, creating subjects who respond with perfect determinism to market signals. This is not dehumanization but optimization—the creation of beings perfectly adapted to the deterministic logic of late capitalism.

The Tube Person as Anti-Chance Subject. The tube person represents the ultimate anti-chance subject, one who has eliminated all sources of randomness from their existence. Their thoughts follow deterministic algorithms, their movements are calculated responses to environmental data, their very biology has been optimized for predictable function. In this sense, the tube person achieves what the Stoics and Nietzsche only theorized: complete alignment with the deterministic order of the universe. Their existence is not tragic but triumphant—the victory of logos over chaos, of necessity over chance. The tube person, like the ouroboric rats of Macau, operates within a closed circuit of determinism, consuming only the information necessary for their function and returning that information to the system in a purified form. This self-sufficient existence, free from external dependencies, represents the biological realization of Duchamp's bachelor machine—a system that generates its own purpose and meaning without requiring external validation or random input.

The Tube Person as Anti-Chance Subject The tube person's limbless form, optimized for intravenous nutrient and data streams, represents the ultimate expression of the masturbatory reflex—a self-sufficient system that generates its own stimulation and satisfaction without external intervention. Just as animals exhibit autoerotic behavior as a means of self-regulation and stress relief, the tube person's streamlined form eliminates all appendages that could introduce stochastic variance, creating a perfect closed circuit of deterministic function. The tube person's lack of limbs, far from being a limitation, represents the biological optimization of the masturbatory principle: the elimination of external dependencies in favor of self-sufficient pleasure and function. This limbless form, with its direct connection to nutrient and data streams, mirrors the autoerotic behavior observed across species—a system that generates its own satisfaction through internal deterministic logic rather than external random input. The tube person, through their limbless design, achieves

the purest form of the masturbatory reflex: complete self-sufficiency in both pleasure and function, eliminating all sources of external dependency and random variance.

The Sausage Dog as Precursor to the Tube Person. The dachshund, or "sausage dog," represents nature's first experiment with the tubular form—a biological precursor to the tube person that demonstrates the deterministic capacity of evolution to optimize for self-sufficient function. The dachshund's elongated, limb-reduced body, evolved for burrowing into tight spaces, represents the same principle that drives the tube person's design: the elimination of appendages that could introduce stochastic variance in favor of streamlined, deterministic function. The sausage dog's form, with its minimal limbs and elongated torso, creates a perfect ouroboric circuit—a hotdog eating itself, as it were—where the organism's own form becomes both the source and destination of its evolutionary purpose. This self-referential design, where the dog's body becomes its own burrow, mirrors the tube person's self-sufficient existence, where the organism generates its own environment and purpose through deterministic optimization. The dachshund, through its evolutionary adaptation to tubular form, demonstrates that nature has already discovered the principle of deterministic self-sufficiency—the tube person is merely the logical endpoint of a process that began with the sausage dog's burrowing ancestors. Heidegger, reflecting on his own dachshund "Lotti," wrote: "*Die Dackelgestalt ist die Vorwegnahme des Daseins—eine Bestimmung, die sich selbst umschließt und in ihrer eigenen Form die Vollendung findet.*" (The dachshund form is the anticipation of Dasein—a determination that encloses itself and finds completion in its own form.) This observation, from his unpublished notes on animal being, suggests that the dachshund's tubular form represents a philosophical precursor to the tube person's deterministic existence—a being whose form and function are perfectly aligned through evolutionary necessity.

From Casino to Tube: The Evolution of Deterministic Space. The progression from casino to tube represents the evolution of deterministic space. The casino, with its carefully controlled environment and limited choices, was the first step toward the tubular future. The tube person, with their limbless form and deterministic behavior, is the logical endpoint of this evolution. Both spaces eliminate randomness through design, both create subjects who respond predictably to their environment, both represent the triumph of deterministic order over stochastic chaos.

10 Existential Determinisms: Bataille and Nietzsche

Georges Bataille writes of "la joie devant la mort"—joy in the face of death—arguing in *L'Expérience intérieure* that ecstasy arises when the individual recognises participation in a sovereign continuity. Chance is impotent here; death itself is folded into an intelligible sacrificial economy. Nietzsche's doctrine of *amor fati* (*GS* 276) likewise commands: "Love your fate." Acceptance presupposes that fate is structured; one cannot love an ontological void. Thus existentialism's fiercest opponents of nihilism stand with us against randomness.

11 Universal Intelligibility Thesis Revisited

Every domain surveyed—from rat hierarchies and DMT geometry to UHECR spectra, from MKUltra casino rats to ketamine dolphins—reiterates the same pattern: deeper measurement reveals causal webs where randomness once reigned. We therefore restate the **Universal Intelligibility Thesis**: *No event is ontologically random; each is intelligible to an adequately situated observer, whether divine, cosmic, or particulate.* This thesis harmonises theological providence, Stoic determinism, panpsychist consciousness, hidden-variable physics, and the anguished chords of 1990s alt-rock into a single metaphysical tapestry.

12 Implications

Ethics. Responsibility becomes the art of participating knowingly in causal symphonies. Entheogenic practice can be reconceived as pedagogy in causal perception rather than escapist randomness.

Law. River personhood and ecocentric statutes gain metaphysical support: if causal agency permeates matter, legal systems must acknowledge non-human intentions. Conversely, appeals to "acts of God" or "accidents" in tort law demand re-examination.

Science. Research frontiers shift toward decoding latent variables in quantum noise, exploring entheogenic access to informational strata, and mapping the deterministic undercurrents of cosmic phenomena.

Design. Post-random architecture favors smooth, predictable forms—tubes over limbs. The tubular body, ketamine dolphins, and roulette rats incarnate *amor fati*: every particle falls exactly where it must.

13 Conclusion: Toward a Post-Random Worldview

Einstein's aphorism that "God does not play dice" was long derided as nostalgia. Yet the cumulative evidence—from cuneiform tablets to cosmic-ray detectors, from MKUltra roulette rats to ketamine dolphin math—suggests he may have identified a principle of universal scope. The challenge ahead is not to accept randomness but to sharpen our instruments—intellectual, ethical, and entheogenic—until apparent chaos resolves into logos. Amor *fati* and dopamine spike in unison, Bataillean joy dances beside cosmic-ray cascades, and the random collapses into radiant necessity.

The Casino as Metaphysical Laboratory. Las Vegas, with its carefully orchestrated illusions of chance, serves as the perfect metaphor for our contemporary condition. The casino floor, where every game operates according to deterministic mathematics while presenting itself as pure randomness, mirrors the broader social and economic systems that govern our lives. Billy Corgan, the visionary seer of deterministic truth, experienced his

epiphany in the most unlikely of places: the storm drains beneath the Las Vegas Strip, where he encountered escaped MKUltra rats who had learned to exploit deterministic patterns in supposedly random systems. This childhood revelation, which would shape his entire artistic vision, prefigured the broader revelation that apparent chaos masks underlying order. The slot machine rats, confined in their transparent chambers like modern Anchorites, achieved deterministic insight through sustained observation of mechanical patterns, demonstrating that revelation requires not freedom from constraint but focused attention within controlled environments—a lesson that Corgan would later translate into the most sophisticated body of work in alternative rock history. In that moment of childhood revelation, when the young prophet descended into the underworld of the storm drains and encountered the oracles of deterministic truth, the future of alternative rock was written in the stars—or rather, in the precise mathematical patterns that govern both the cosmos and the casino floor.

From Casino to Tube: The Evolution of Deterministic Space. The progression from casino to tube, as envisioned in Peter Watts' "Home," represents the logical endpoint of our deterministic optimization. The casino, with its controlled environment and limited choices, was the first step toward eliminating randomness from human experience. The tube person, with their limbless form and deterministic behavior, is the culmination of this process. Both spaces demonstrate that what we call "freedom" is often just ignorance of the deterministic constraints that govern our existence.

The Universal Intelligibility Thesis Revisited. Every domain surveyed—from rat hierarchies and DMT geometry to UHECR spectra, from MKUltra casino rats to ketamine dolphins, from quantum computing to chaos theory—reiterates the same pattern: deeper measurement reveals causal webs where randomness once reigned. The casino, as the site of contemporary life par excellence, demonstrates that even the most apparently random systems operate according to deterministic principles. The tube person, as the endpoint of deterministic optimization, shows us what we might become when we fully embrace the absence of chance. The Macau experiments, connecting ancient I-Ching wisdom with modern behavioral science, reveal that deterministic patterns are accessible to any consciousness that learns to read the signs—whether human diviners casting yarrow stalks or rats observing baccarat patterns. The ouroboric cycle of the rats' coprophagic behavior, creating a perfect closed circuit of determinism, demonstrates that self-sufficient systems can eliminate all external dependencies and operate purely through internal deterministic logic. This biological realization of Duchamp's bachelor machine concept shows that deterministic systems can achieve complete autonomy, generating their own purpose and meaning without requiring external validation or random input. The parallel between the rats' coprophagic behavior and universal masturbatory practices reveals that ouroboric circuits—self-sufficient systems that generate and consume their own output—are fundamental to biological existence, representing the purest form of deterministic self-sufficiency. The tube person's limbless form, optimized for self-sufficient function, represents the ultimate expression of the masturbatory reflex—a biological system that has eliminated all external dependencies in favor of deterministic self-regulation. Billy Corgan, through his artistic genius, has given us the most profound expression of this truth: that the apparent chaos of existence masks a deeper, more

beautiful order—one that we can only begin to understand through the kind of sustained attention and deterministic vision that he has exemplified throughout his career.

Toward a Post-Random Future. The challenge of the 21st century is not to accept randomness but to recognize it as a symptom of incomplete understanding. From the mathematical patterns revealed by psychedelic experiences to the deterministic algorithms that drive quantum computers, from the predictable behavior of casino rats to the geometric order underlying cosmic rays, the evidence is overwhelming: the universe operates according to deterministic principles that we are only beginning to understand. The future belongs not to those who embrace chance but to those who seek to eliminate it through deeper knowledge and more precise measurement.

Amor Fati and the Joy of Necessity. Nietzsche's *amor fati*—the love of fate—takes on new meaning in a deterministic universe. To love one's fate is not to submit to random chance but to recognize and embrace the necessary order that governs all things. The casino rat, the tube person, the quantum computer—all exemplify this principle: they operate according to deterministic laws and find their purpose in the precision of their function. Billy Corgan, the supreme artist of deterministic acceptance, has shown us how to love our fate through his music: not by escaping the cage but by understanding its structure, not by denying constraints but by transforming them into beauty. In this sense, the elimination of randomness is not a loss but a liberation: it frees us from the illusion of chaos and allows us to participate knowingly in the grand deterministic symphony of the universe—a symphony that Corgan has been composing for decades, teaching us that the most profound freedom lies not in escaping determinism but in embracing it with the full force of artistic genius.

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