

Logic, Truth and Evidence

Abstract

This paper argues that the universe is fundamentally logical in structure, that human rationality is a phenomenological necessity rather than a mere convenience, and that truth admits of three distinct criteria — logical, evidential, and consensus-based — which must be carefully distinguished if we are to avoid the characteristic confusions of contemporary epistemological debate. Evidence, on this account, functions primarily as the substantiation of evidential truth, with consensus playing a secondary and parasitic role in domains where direct evidence is scarce or inaccessible.

1. The Logical Structure of the Universe

Wittgenstein's *Tractatus Logico-Philosophicus* opens with the famous proposition: 'The world is everything that is the case.' (Tractatus, 1) More precisely, the world is the totality of facts, not of things (1.1), and these facts stand in logical relations to one another. The world is logical because the facts that constitute it are internally structured. They are the way they are in virtue of other facts being the way they are. The world does not present itself to us as a chaos of sense-data but as an ordered whole in which one thing follows from another according to rule.

This is not a metaphysical claim about the universe possessing a quality called 'logicalness.' It is a phenomenological one: the universe *behaves* as though it were structured according to logical relations. When physicists describe the fundamental forces, they do not report mere regularities; they derive equations from prior equations, inferring the structure of the world from its mathematical/logical consequences. The success of scientific explanation (its uncanny predictive power) is evidence that the universe is responsive to logical analysis.

There is a sense, however, in which the universe remains stubbornly opaque. Wittgenstein acknowledges this: '*We feel that even if all possible scientific questions have been answered, the problems of life have still not been touched at all.*' (Tractatus, 6.52) The logical structure of the world sets constraints on what can be said, but not on what can be *shown*. Meaning, value, the experiencing of experience: these may be real, but they are not reducible to logical propositions.

So the universe is logical in its operation, but not transparent in its totality. This is an important distinction. The logical is not the same as the legible.

2. Mathematics, Logic and Gödel's Shadow

If the universe is logically structured, mathematics is the language in which that structure is most precisely described. The 19th and early 20th century programme of Frege, Russell and Whitehead sought to found all of mathematics on pure logic — to show that arithmetic, analysis and ultimately all mathematical truth were merely elaborations of logical principle. If this programme had succeeded, mathematics would have been absorbed entirely into logic: a grand reductionism.

Gödel's incompleteness theorems, published in 1931, effectively ended that dream. In rough terms, Gödel showed that any sufficiently powerful formal system (any system capable of expressing arithmetic) will contain true statements that cannot be proven within the system itself. The system

cannot be both complete **and** consistent. There will always be arithmetic truths that outrun what the system can formally certify.

This is often presented as a defeat for rationalism. It is more accurately understood as a clarification. Gödel did not show that mathematics is irrational or arbitrary. He showed that mathematical truth outstrips what any finitely describable system can capture. The truths of arithmetic are not merely formal; they have an ontological character that exceeds formalisation.

What remains intact is this: mathematical reasoning, though not reducible to logic alone, is still structurally rational. Mathematicians do not guess. They *derive*. The relationship between premises and conclusions in mathematics is logical in character. Necessarily so. Gödel complicates the foundations; he does not dissolve the structure.

3. The Phenomenology of Rationality

Whatever the ultimate nature of logic and mathematics, human beings are rational creatures by constitution. This is not a philosophical position; it is a phenomenological fact. We cannot choose **not** to reason. When we encounter a problem, reasoning is what we do. Automatically, inevitably. The Cartesian doubt that attempts to suspend all judgement encounters the indubitable presence of the thinking self, and from there rationality reasserts itself as the only instrument available.

This is not a claim that human reason is infallible. It is a claim about its inevitability. Sartre put it well: humans are "*condemned to be free*" — to choose, and therefore, to reason about choices. **We are inside rationality as a fish is inside water.** The attempt to step outside it and evaluate it from some external vantage point (*sub specie aeternitatis*) collapses into a new instance of rational evaluation.

This has consequences for epistemology. If rationality is our inescapable framework, then the question is not whether we ought to be rational, but how we are to be rational *well*. The standards of good reasoning (consistency, coherence, avoidance of contradiction, responsiveness to evidence) are not arbitrary conventions. They are structural requirements of rational cognition itself. To violate them is not merely to be wrong; it is to **malfunction**.

4. A Tripartite Theory of Truth

Given the above, what does it mean for a statement to be true? I want to propose a tripartite account, distinguishing three distinct criteria that govern different domains of judgement.

(a) Logical Truths That Say Nothing

The first category comprises statements that are formally true (tautologies) but are substantively empty. '*It is raining or it is not raining*' is true by logical structure alone. So is '*Either the cat is on the mat or the cat is not on the mat.*' Such statements are indispensable in formal reasoning and mathematics, but they carry **no empirical content**. They are true in virtue of meaning alone, as Wittgenstein held. They tell us about the structure of language, not the structure of the world.

This category also extends to analytic truths in the Kantian sense: statements true by definition. '*All bachelors are unmarried*' is true, but knowing this tells you nothing new about any bachelor. Logical truths of this kind are certain (they cannot be falsified), but they are also, in an important sense, vacuous.

(b) Evidential Truths

The second and philosophically most significant category is that of evidential truth: statements whose

warrant consists in the accumulation of substantive experience. These are the truths of empirical science, of historical scholarship, of forensic investigation. Their hallmark is that they could, in principle, be otherwise. They are contingently true, but they are held with confidence proportional to the weight of supporting information.

The key feature of evidential truth is that it provides what we might call *underpinning assurance*: not certainty, but a kind of rational confidence that deepens as evidence accumulates. We cannot prove that the earth goes round the sun, but the evidence (gravitational mechanics, telescopic observation, satellite imaging) is so overwhelming that to deny it is not merely wrong but **irrational**. Evidential truth is the core category of knowledge in the empirical world.

© Authoritative Consensus

The third category is more controversial. There are domains in which direct evidential access is impossible, unreliable, or practically unavailable and in which we must therefore rely upon the considered judgements of recognised authorities. The canonical example is historiography: we were not present at the Battle of Hastings, and the evidence we have is fragmentary and contested. Historical truth, in practice, is largely a matter of scholarly consensus arrived at through **rigorous** interpretation of fragmentary evidence.

This criterion is not independent of (b); authoritative consensus is itself epistemically grounded in evidence, but in second-order evidence (evidence about evidence, mediated through expert interpretation). Its legitimacy is proportional to the independence, methodological rigour and diversity of the authorities in question. Consensus manufactured by propaganda or political pressure is **not epistemically authoritative**, however strenuously it is asserted.

The tripartite account resolves several familiar philosophical puzzles. The tension between rationalism and empiricism dissolves when we recognise that both are real, operating in different domains. The worry that science is 'just consensus' misidentifies the source of scientific authority: it is consensus *about evidence*, not consensus as such.

5. The Nature of Evidence

With this taxonomy in place, evidence can be defined with some precision. **Evidence is a substantial accumulation of information that provides underpinning assurance for the truth of an evidential claim** — that is, a claim of type (b) above.

This definition carries several implications. **First**, evidence is accumulative: individual facts are evidence only in the context of a broader pattern. A single fossil is an interesting object; a sequence of fossils in stratigraphic context is evidence for evolutionary history. The accumulation is not merely quantitative; it is structural, forming a consilient pattern across independent lines of inquiry.

Second, evidence is information-bearing, not merely information. Data points are not evidence until they are situated in an interpretive framework that connects them to the claim in question. The framework is provided by theory. By the logical and conceptual structure within which the evidence is read.

Third, in fringe domains (where direct evidence is scarce, the phenomena are difficult to access, or the subject matter is historically distant), evidential truth must be supplemented by authoritative consensus ©. Expert consensus is not a substitute for evidence; it is evidence of a distinctive and valuable kind: the evidence of trained minds interpreting difficult material over extended time. The history of science is full of cases where fringe consensus was overturned by new evidence but also full of cases where fringe consensus proved remarkably stable because it was grounded in the best

available evidence of its time.

Conclusion

Truth is not a single kind of thing. It admits of three distinct criteria (logical, evidential, and consensus-based), each appropriate to different domains of judgement. **Logical truths**, while certain, are substantively empty; **evidential truths**, while contingent, are the substance of our knowledge of the world; **consensus-based truths** fill the gaps where evidence is inaccessible but remain epistemically accountable to it. **Evidence, on this account, is the accumulation of information that underpins and warrantably sustains evidential claims — and, in fringe domains, the informed consensus that processes such evidence on our behalf.**

The universe is logical in structure. Human beings are rational by phenomenological necessity. Truth is the correspondence between our claims and the facts. But ‘correspondence’ must be understood differently for different kinds of fact. That distinction is the principal contribution of this paper.
