

Preface

For most of my life, I assumed I understood what the world was made of.

Like many people trained in science and technology, I learned to think of reality as composed of things. Particles combine into atoms, atoms into molecules, molecules into cells, cells into organisms. From neurons come minds. From matter and motion, everything else follows. It is a powerful and deeply intuitive story, one that works remarkably well for many purposes.

Over time, however, it began to feel incomplete.

Very different systems kept arriving at the same outcomes. Evolution independently invented eyes, wings, and complex neural circuits. Brains across species converged on similar architectures for perception, navigation, and control. Human languages, which arise spontaneously in separate cultures, repeatedly settled into similar grammatical structures. Artificial intelligences, trained independently and built in different ways, rediscovered the same internal representations for meaning and structure.

These were not isolated coincidences. They were convergences.

What troubled me was not that these patterns appeared, but that they appeared so reliably. If reality were simply an open-ended accumulation of things and interactions, we would expect far more variety than we actually observe. Instead, certain forms feel almost inevitable, while others never appear at all. The world seems constrained in ways that our usual explanations rarely address.

Biology makes this especially clear. A living cell is not defined by the specific molecules it contains—those are constantly replaced—but by the boundary that regulates its interaction with the environment. Preserve that boundary and the cell persists, even as its internal components change completely. Destroy it and the cell ceases to exist, even if all the molecules remain. Identity depends less on substance than on constraint.

The same logic appears in cognition. A mind is not a static object stored in the brain, but an ongoing process that maintains coherence through perception and action. When those loops break, cognition degrades, even though the neurons remain intact. Intelligence persists only as long as the boundary between internal expectations and external reality is actively maintained.

Physics hints at the same pattern. Stable structures—from atoms to stars—exist only where forces balance in just the right way. They are not inert things, but dynamic patterns maintained by constraints. Remove those constraints and the structure dissolves. What we call "things" are, in this sense, patterns that endure because the conditions around them allow them to.

Yet the conceptual frameworks we usually reach for do not quite capture this. We speak of emergence as if it were a final explanation, when it is often just a label for what we have not yet understood. We describe how complexity arises, but rarely ask why it arises in these particular forms and not others. We focus on mechanisms and histories, but overlook the shape of the space those mechanisms move through.

What I slowly came to suspect was that we were mistaking outcomes for foundations. Things are not the fundamental units of reality, but the visible traces of something deeper. What really matters are the interfaces—the boundaries that constrain interaction, reduce uncertainty, and make persistence possible in the first place.

This book is an attempt to take that suspicion seriously.

The central claim is simple to state, even if its implications are far-reaching:

Reality is not fundamentally made of things, but of stable interfaces navigating a structured space of possibilities.

This is not a denial of matter or physics, but a shift in what we treat as primary: from self-contained objects to the constraints and boundaries that allow stable patterns to exist at all.

Seen this way, what we experience as things are not illusions, but achievements. They are patterns that hold because their interfaces work. A system remains "the same" not because its components are fixed, but because its interaction with the world is constrained in a way that allows coherence to persist. When those constraints fail, identity dissolves—even if the parts remain.

Once I began looking at the world through this lens, ideas that had previously seemed unrelated began to align. Platonic notions of form started to look less mystical and more like descriptions of stable regions in a space of possibilities. Category theory's emphasis on transformations over things began to mirror how physical and biological systems actually behave. The Free Energy Principle and the concept of Markov blankets provided a language for understanding why systems persist in the face of uncertainty. Artificial intelligence, rather than imitating human intelligence, began to look like a tool for exploring the same underlying landscape of possible minds that evolution has been navigating all along.

This book does not aim to replace existing scientific theories, nor to introduce a new metaphysical doctrine. Its goal is to connect patterns that already exist but are usually discussed in isolation. Physics, biology, intelligence, and cognition all point toward the same underlying structure once we stop treating things as primary and start paying attention to the conditions that make things possible.

It is written for readers who sense that the world is more ordered than our explanations often admit, but not in a simple or mechanical way. It assumes curiosity rather than agreement, and it does not require advanced mathematics—only a willingness to question familiar metaphors and follow patterns where they lead.

If the argument succeeds, you may find yourself thinking less about what the world is made of, and more about what allows it to exist, to persist, and to make sense at all. You may begin to see interfaces everywhere—in the boundaries of cells, the structure of minds, the design of machines, and the patterns that emerge when systems interact.

That shift in perspective is where this book begins.