



Quantums of Cognition

WHAT THE MIND
IS MADE OF

William de France

ÉDITIONS CLEMENTINIUM

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*What we experience as indivisible wholes of the
mind
are assemblages of a small number of units
that we have hardly invented ourselves.*

Idea of the volume

PART I

THE ELEMENTS

I

THE GRAIN AND THE STACK

Placed on the black stage of a binocular microscope, under the harsh, low-angle light of a lamp, a simple grain of common table salt initially resembles a negligible imperfection. It is a grey speck, an anonymous piece of debris gathered at random from a salt shaker. To the naked eye, nothing distinguishes this tiny fragment from countless other shapeless shards. Yet, as the hand turns the focusing wheel, the blur dissolves, giving way to a sight of stunning regularity. The uncertain roundness sharpens, the contours straighten, and the grain finally reveals its true nature: a perfect cube, with edges of geometric sharpness, and smooth, orthogonal faces that reflect light with the precision of a crystal mirror. The formless was merely an approximation due to distance. Up close, matter abandons its false appearances of continuity to declare itself in discrete units, in stable elementary volumes that associate without ever merging.

The same is true of our own mind. On a daily basis, we experience our consciousness as an uninterrupted flow, a lukewarm, transparent current traversing the hours without apparent seams. We glide from an idea to a sensation, from a memory to a decision, with the comforting feeling of being a unique presence, an indivisible and sovereign block. This is again the illusion of distance. As soon as we lean over the mechanics of our thoughts, as soon as attention becomes instrumental and we observe the mind at the precise moment its gears jam, the continuity vanishes to reveal the granularity. The mind is not a single, homogeneous, and immaterial breath. It is a scaffold of distinct layers, stacked through a long evolutionary history. At each level, invisible processes collaborate in the background, combining basic building blocks to give birth to what we call our thoughts.

This book proposes a journey to the heart of these elementary pieces, these quantum of cognition that form the hidden fabric of our lived experience. We will first see how our own mind is composed from these ordinary building blocks, from our deepest needs to the way we segment space and time. We will then go to meet other intelligences, born on other shores of evolution:

the octopus in its tank, the crow with its tool, the killer whale transmitting its culture, or the ant colony calculating without a center. Each in their own way, these different minds will show that the program of thought can run on physical substrates radically distant from our own. Finally, we will turn to the thin film that makes up our human singularity, before looking at the new artificial minds that are beginning to assemble outside any biological substrate. Our goal is not to profane the mystery of the mind, but to reveal its architectural beauty. For understanding how the pieces assemble takes nothing away from the miracle of consciousness, just as knowing that salt is a cube will never rob it of its flavor.

2

THE SUSPENDED WORD

A discussion becomes lively around a table, in the warmth of a shared meal. Sentences are exchanged effortlessly, laughter punctuates anecdotes, and words glide from one mouth to another with an almost magical fluidity. Then, suddenly, a grain of sand slips into the gears. In the middle of an ordinary sentence, a sudden blank appears. One searches for a proper name, the title of a film seen last week, or the surname of an actor whose face is nevertheless perfectly familiar. The mind tenses, churns, turns upon itself, but the slot remains blank. One feels a familiar, almost physical irritation. One knows with absolute certainty that one possesses the information; one is able to indicate its approximate length, sometimes its first letter or syllabic cadence. One caresses its mental contour, weighs its meaning, and yet the word itself remains obstinately out of reach, suspended in an invisible limbo. This is the universal experience of having a word on the tip of one's tongue, a tiny and

harmless breakdown that everyone goes through regularly without ever paying attention to it.

Yet, this daily blockage is an invaluable window open onto the secrets of our mental architecture. Ordinarily, when we speak, naming a thing appears to us as an immediate, single, indivisible act. Conceiving the idea of a table and pronouncing the word "table" seem to happen in a single breath, by a gesture of the mind so rapid that it leaves no room to break it down. But the accident of the suspended word shatters this illusion. The breakdown reveals that what we took for a monolithic action is in reality a complex assembly of distinct operations, some successive, others simultaneous. In the case of the word on the tip of the tongue, the meaning is perfectly retrieved and active. The sound form, on the other hand, remains blocked in long-term memory. And, to complicate the picture further, a third mechanism, the one that produces the irritating sensation of "knowing that one knows," activates independently to force us to search. The breakdown decouples these pieces before our eyes and lets them float separately, showing us that the miracle of fluid expression is merely a precarious balance between several specialized programs.

This breakdown thus acts as our first quantum

of cognition. It forces us to admit that the apparent continuity of our mental life is only an optical illusion. In the same way that a printed word on paper reveals itself to be composed of individual letters only at the precise moment a typographical error omits one, our thought delivers its segmented nature only when it stumbles. The mental alphabet hides behind the flow of our speech. We are not an indivisible consciousness, a single-piece soul expressing itself freely; we are an assembly of basic units, a gathering of small programs collaborating in silence. By learning to look at these breakdowns, we learn to dismantle the mind to understand its assembly.

The most ordinary act of thought, viewed at the moment it jams, reveals itself to be made of parts that can function separately. Nothing in the mind is of one piece.

3

THE SILENT WATCHER

On a beach of warm sand, a tiny sea turtle hatches from an egg in a nest buried under the sand, then struggles up to the surface. It expects no one, sees no parent to guide it, and immediately heads, at a mechanical and hurried pace, toward the white foam line of the ocean shining under the moon. It is born alone, equipped to face an immense and cold world without the slightest prior learning. A few thousand kilometers away, in the dim light of a cozy den, a newborn puppy whimpers softly as soon as it drifts just a few centimeters away from its mother's fur. Its eyes are still closed, its ear canals still shut, and its immediate survival depends entirely on a visceral attachment bond, on a constant call for the comforting presence of the other. These two entrances into life represent two philosophies of survival, written into the flesh of each species.

Why are these two trajectories so opposed? Not by chance or by some poetic whim of nature:

the environments in which their ancestors evolved placed radically different demands. For the sea turtle, the immediate danger is on dry land; its strategy consists of fleeing toward the water as quickly as possible, relying on numbers so that a fraction of the brood survives. For the mammal, the infant is a precious and fragile investment; group protection and maternal care are the absolute conditions of its survival. Each species is thus the result of a rigorous specification sheet, written by millions of years of evolutionary history. Our needs do not arise from nothing, and they are not personal choices; they respond to very ancient design problems.

In our own minds, these requirements function as silent watchers. In computer terms, a need is not an active program running in the foreground of our consciousness. It is a background process, an invisible background service that runs silently and constantly monitors a vital variable (body temperature, blood sugar level, or the proximity of our social partners). As long as the measurements remain within the limits set by the ancestral specifications, the watcher remains silent. But as soon as a gap widens, it sends a major interrupt signal in the form of an emotion or an urge (hunger, fear, or loneliness). The conscious mind

is then startled awake and summoned to find a practical solution in the real world.

We spend our lives inventing sophisticated solutions to satisfy these primitive signals. Evolutionary history did not write the details of our daily actions, but it defined the fundamental ingredients and the rules of our appetite. This is the recipe metaphor: nature did not design the complex dishes we prepare today (our laws, our institutions, our careers), but it selected the basic needs that push us to cook. We are the cooks working from an old culinary grimoire, inventing new flavors based on ancestral desires that have watched over us since the dawn of time.

Our needs are not self-evident: they are the demands of a world, turned into a vigilance that never stops.

*YOU HAVE JUST READ THE
PROLOGUE
AND THE FIRST TWO CHAPTERS.*

The complete book contains a prologue, nine
chapters
in three parts, an epilogue, and two appendices.

PART I — The Elements

*The Suspended Word · The Silent Watcher · The
Alphabet of the Mind*

PART II — The Comparative Cases

*The Gaze from the Other Shore · Thought Outside
The Other Matter · The Lineage Without Writing*

PART III — Syntheses

*The Sacred Compounds · The Infinite Grid · The Last
Grain*

APPENDICES

The Prolegomena · The Applied Model

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