04 · READING GUIDE

INSIDE

Maintaining, Recording, and Reconstructing

WHAT IT IS

Inside investigates how a living organization preserves, selects, and transforms the effects of its history, allowing the past to continue participating in its operations without having to reappear as a conscious recollection.

In the Theory of Continuous Mind (TMC), recording does not mean storing an intact copy of an experience, but **incorporating differences capable of modifying subsequent encounters**. The chapter investigates how these marks, whether individual or inherited, participate in shaping the present and the conditions under which we experience the world. **Thus, consciousness in the present does not begin from a zero point: it takes place in an organization already transformed by the marks of its trajectory.**

WHAT QUESTIONS DOES THIS CHAPTER INVESTIGATE?

- If we forget an experience, what of it may still remain within us?
- How can bacteria, plants, and other organisms record without possessing conscious memory?
- Why do recalling, preserving, and forgetting require resources and transform our records?
- How can a history predating birth influence the first encounter of a new living being?

KEY INSIGHTS

- **To record is to prevent the past from ceasing to make a difference.** An experience can disappear from recollection and

continue changing the conditions of subsequent encounters.

- **Memory does not begin in the brain.** Different organisms incorporate the effects of their history through distinct material mechanisms, without this implying conscious recollection.
- **Form makes recognition possible; Texture records how something came to matter.** Information, Weight, and Valence can change and decay at different rates.
- **Forgetting also participates in continuity.** Preserving everything would be energetically unviable; selecting, compressing, and losing are part of the work of keeping an organization operative.
- **In individual memory, the past changes the next encounter; in lineage memory, it may change the first.** The new instance receives conditions from a history it did not live through.

PURPOSE / CONNECTIONS

- **Philosophy of mind:** investigate how the past participates in constituting present experience, distinguishing functional recording from feeling.
- **Biology:** understand how organisms incorporate history and modify their future operations.
- **Neuroscience:** relate memory, reconsolidation, emotion, forgetting, and plasticity.
- **Artificial intelligence:** distinguish storing information from possessing a State transformed by earlier operations.

PLACE IN THE THESIS

Following the presentation of the Triad, Chapter 4 develops its first direction: **Inside**. It examines how an organization maintains and reconstructs the present instance, incorporating effects from its trajectory.

Chapter 5 will investigate **Between**, showing how these records are accessed and participate in new encounters. Subsequent chapters will deepen the relationship among trajectory, the self, cognition, and the Apparatus.

PATH THROUGH THE INVESTIGATION

01 FUNCTIONAL INSIDE

02 MATERIAL RECORDING

03 PLASTIC MEMORY

04 INHERITED MEMORY

05 EMPIRICAL TEST

CHAPTER 04 · BLOCK 01

4.1 FUNCTIONAL INSIDE

How the Past Continues to Operate

WHAT IT IS

Defines Inside as the work of maintaining, recording, and reconstructing the present instance. It explains why the past can remain operative even in the absence of conscious recollection.

QUESTIONS

- In what sense is a living system transformed by the operations it performs?
- Why is recalling not the same as recording?
- What do the records of bacteria and plants have in common—and how do they differ?

KEY INSIGHTS

- Recording means preserving a difference with subsequent effects, not storing a complete scene.
- Biological examples show distinct material means of incorporating history, without demonstrating consciousness in these forms of life.
- Inside is a causal work of the organization, not a spatial position or an isolated property.

IN THIS BLOCK

4.1.1 Nothing Living Merely Executes

4.1.2 To Learn Is to Survive

4.1.3 The Limits of Recording and Retrieval

4.1.4 Recording Without Anthropocentrism

4.1.5 What the TMC Calls Inside

4.1.6 Inside Is Not a Spatial Position

4.1.7 What Is Not Sufficient to Define It

4.1.1 — Nothing Living Merely Executes

A purely executing mechanism is initially described as one that applies a rule without being transformed by it. Living systems, however, do not operate without modifying their records: every experience leaves some mark, however slight. Marks can accumulate, change, or be replaced by others, and they all undergo decay to varying degrees. The very act of accessing these marks also modifies what is accessed.

> **Terminology note —** From this point forward, *record* designates the abstracted information that remains from an encounter; *mark*, the way that record became marked for that trajectory. When the encounter is felt, its Form corresponds to the abstracted information, and its Texture characterizes how it was experienced, through Weight and Valence. Form and Texture are plastic and may decay at different rates. Functional recording can also occur without demonstrated felt experience.

This occurs whether or not the act is conscious. The past does not remain merely as a record of the event; it becomes part of the conditions of the next act. The organism's present state already incorporates the effects of its trajectory. **The past need not return as a recollection to continue influencing the present**; it only needs to have left a mark that changes subsequent reactions. What we perceive as now is the past coming into the present.

> **The record is the moment when time ceases to be merely past and becomes present structure.**

> **The past does not push the organism from behind; it inclines the paths that open ahead.**

4.1.2 — To Learn Is to Survive

Learning means preventing every encounter from being the first. Experience exacts its price, but learning offsets that investment by reducing risks and increasing the gains of subsequent encounters. Without a record, action merely responds to the present; with one, it becomes possible to move from the operational to the tactical, and from the tactical to the strategic. The record is the map of adaptive intelligence: it transforms isolated experiences into guidance for a trajectory. **The next encounter no longer encounters the same organism.**

> **The future that is chosen also selects which pasts will remain alive in the present.**

4.1.3 — The Limits of Recording and Retrieval

Recording is not like keeping a camera and a microphone running without interruption. No organism possesses the capacity, material substrate, time, or energy to store and process everything that passes through it. In the human brain, this work takes place within an energy budget on the order of 20 W. Since every selection and every response has a cost, **operating within this limit requires filtering, compressing, excluding, or abstracting at the point of entry.** Accessing a record is not like opening a drawer either: it requires energy to reconstruct in the present from the marks that remain of the past. Throughout its evolutionary trajectory, life has been sustained not only by effectiveness—achieving a result—but also by efficiency, adjusting its operations to the resources available.

4.1.4 — Recording Without Anthropocentrism

> To recall is to access a record and make it participate in the present process. To record is to prevent the past from ceasing to make a difference. Human memory is an elaborate and distinctive way of recording and recalling—one among several possible ways for the past to remain operative—not the definition or measure of the entire process.

This understanding is not merely abstract: it finds empirical parallels in biological processes that long predate the emergence of brains.

In certain bacteria, an encounter with a virus can leave fragments of its sequence incorporated into the CRISPR system. Barrangou and colleagues

showed that adding or removing these fragments altered resistance to the next attack. **The bacterium does not recall the infection as a scene**: the first encounter leaves a molecular difference that modifies the second (Barrangou et al., 2007).

Something similar occurs in plants. After weeks of cold, *Arabidopsis thaliana* modifies its chromatin and keeps the FLC gene repressed, altering its flowering when temperatures rise again. The plant does not store an image of winter; it retains what winter changed within it (Bastow et al., 2004).

> In *Physarum polycephalum*, an organism without a nervous system, the presence of food modifies the diameters of its tubular network, redirecting subsequent flows and movements. In this case, the record is not found in a separate archive but in the organism's present form itself (Kramar and Alim, 2021). This interpretation is strictly systemic: recording does not require a mental representation but a physical reconfiguration.

Bacteria, plants, and *Physarum* do not record through the same mechanism. They nevertheless share a minimal function: the past leaves a material alteration that changes how the future will be encountered. These are not merely curiosities of simple life but distinct manifestations of the same organizational possibility: the system's history can modify its future operations.

All these cases operate according to the maxim stated at the outset: to recall is to access a record and make it participate in the present process. To record is to prevent the past from ceasing to make a difference.

4.1.5 — What the TMC Calls Inside

Inside is the causal work through which an organization maintains, repairs, and reconstructs the present instance. It does not simply mean what is physically inside, nor can it be reduced to metabolism. **It includes the capacity to preserve the effects of contacts made through Between** in the form of records and their marks, from simple alterations to complex memories.

> **Repair restores what was lost; recording incorporates what happened.**

> **Inside is where the world passes through the being and leaves marks in matter.**

4.1.6 — Inside Is Not a Spatial Position

The name Inside retains its connection to the internal maintenance of the instance, but it does not delimit a compartment. Its operations and marks may be distributed across the organization's chemistry, form, tissues, and connections. The physical interior participates in Inside; it is not, however, sufficient to define it.

4.1.7 — What Is Not Sufficient to Define It

The following are not sufficient on their own:

- being physically inside;
- possessing a membrane;
- carrying out metabolism;
- maintaining momentary homeostasis;
- repairing a component;
- storing information or memory;
- maintaining a static form;
- possessing neurons.

Each of these properties may participate in Inside, but none defines it on its own. The criterion is its participation in the work through which the organization maintains, repairs, records, and reconstructs the present instance.

CHAPTER 04 · BLOCK 02

4.2 MATERIAL RECORDING

How Experience Leaves Marks

WHAT IT IS

Examines the cost of recording and the need to filter, compress, and abstract. Introduces Form, Texture, Weight, and Valence and their roles in orienting

operations.

QUESTIONS

- Why does preserving records require resources and selection?
- What is the difference between the Form of an encounter and the Texture it leaves?
- How do different Weights and Valences participate in a decision?

KEY INSIGHTS

- Recording requires matter and energy; conserving resources is part of the adaptive process.
- Form and Texture distinguish a recognizable outline from the evaluative significance of a mark for a trajectory.
- Conflicts among marks can produce an operational direction without requiring a separate commander.

IN THIS BLOCK

4.2.1 Recording Has an Energy Cost

4.2.2 To Record Is to Reduce

4.2.3 Form, Texture, Weight, and Valence

4.2.4 The Resultant Vector and the Emergence of the Self

4.2.1 — Recording Has an Energy Cost

Intuitively, we believe that an experience passes, but its record must be constructed and then participate in operations again; otherwise, it would amount to no more than a cognitive hiatus. For the past to remain operative, the organism must modify and stabilize matter—and that costs energy. **To record is to pay an energy cost in the present so as not to have to pay the entire cost again in the future.**

> That is why life does not attempt to preserve everything it encounters. When sustaining a mark costs more than the organism can bear, survival may require abstraction or forgetting; maintaining it beyond that limit may cost the being its very existence. To economize is to survive. Living beings struggle to conserve scarce resources and, by operating on the basis of their experiences, adapt to challenges by creating more efficient

> strategies: a cognitive Darwinism—a term used by the TMC to define this process at the scale of the lineage.

4.2.2 — To Record Is to Reduce

Recording is not preserving a smaller copy of an event, but converting it into a reusable structure. To recognize a tiger at a second encounter, the organism cannot preserve the first encounter in its entirety: it must discard the lighting, the position, the noises, and other circumstantial details, while preserving relations that may recur. Filtering selects which aspects of the contact will be incorporated into the record; compression preserves those relations in a more economical form; abstraction discards particulars to preserve an outline capable of guiding other encounters. Yet **every abstraction is also a hypothesis about what the future will not need**: the same cut that enables recognition can also lead to confusion. The records of living beings do not preserve the ideal sharpness of the event, but functionally usable outlines, shaped by the lineage's history of selection and by the experiences of the instance itself. Errors arising from the imprecision of records also enter the evolutionary process: over the course of a trajectory, trial and error select solutions with a better cost–benefit balance.

Drosophila melanogaster, commonly known as the fruit fly, has neurons, a nervous system, and a brain. In an experiment, Plaçais and Preat (2013) observed that, when deprived of food, the flies did not simply stop learning. Their brains specifically suppressed the formation of a lasting memory of a negative experience that could have helped them avoid the same danger in the future, because this type of memory was more costly. The researchers, however, artificially activated the neurons responsible for initiating that memory, forcing the starving organisms to form it without receiving food. The memory formed, but the flies survived for approximately 30% less time. The suppression was therefore not a failure of the brain, but a way to conserve resources and keep the organism alive. In this case, economizing meant surviving.

4.2.3 — Form, Texture, Weight, and Valence

While abstraction preserves a reduced Form of the encounter, the record also preserves how that encounter left its mark on the trajectory. When examined in its character as felt experience, this mark is called Texture, analyzed through two dimensions: Valence—the affective tone of the experience—and Weight—the relevance and intensity with which the mark

participates in the present operation. The direction of Valence can be represented in simplified terms by positive, negative, or neutral Polarity.

When recording a tiger, the organism preserves not only a simplified Form, such as its silhouette, the color of its coat, and its teeth. It also preserves how its features came to carry weight for that trajectory. The teeth may acquire negative Valence and high Weight; other features may remain neutral or acquire another Valence and another Weight.

Form makes recognition possible; Texture records how the trajectory made something matter.

Valence and Weight

Each mark can be described by a Valence and a Weight. **Valence indicates its direction**—positive, negative, or neutral; Weight indicates the relative strength with which it participates in the operation. Marks, therefore, do not enter the contest on equal terms: some barely alter the resultant, while others may dominate it.

> **Polarity represents the direction of the arrow; Weight, its length.**

Marks with greater Weight tend to receive priority during retrieval and may resist decay longer, without necessarily preserving more details of the experience. A mark may remain intense even when its Form has lost clarity.

Cahill and McGaugh (1995) presented participants with the same images, accompanied by two different narratives: one neutral and the other more emotionally intense. Two weeks later, those who had heard the emotional version recalled the story better. The visual image was the same; the emotional condition changed what remained available in memory. In the TMC's interpretation, this result is compatible with the hypothesis that records are preserved not only according to their Form, but also according to differences in Weight.

Composite Valence and Impulse

> A scene contains objects that appear to be simple units, but each object is composed of different signals: shape, color, smell, tactile qualities, movement, position, among others. Each signal may acquire positive, negative, or neutral Valence, with its own Weight. The arrangement of these Valences and Weights forms a composition. Thus, for the organism, an object is not reducible to simply liking or disliking it: it becomes a grouping of Valences and Weights that composes its Texture and generates complex impulses, such as a guilty desire or a tempting repulsion. These impulses may produce equally complex tendencies

> toward action, such as feeling fear and fleeing, stealthily pursuing something, or seeking a particular food rather than other abundant foods. Such impulses may arise even without a prior abstract record of a specific Form.

When positive and negative Valences remain active simultaneously, their composition does not necessarily produce neutrality: it may produce an ambivalent impulse that attracts and repels at the same time.

This coexistence is compatible with bivariate models of affect, in which positivity and negativity may remain simultaneously active, producing ambivalence rather than neutrality (Cacioppo, Gardner, and Berntson, 1997).

Hare, Camerer, and Rangel (2009) asked participants to evaluate foods according to taste and health effects, and then decide whether they wanted to eat them. The same food could receive a positive evaluation for taste and a negative evaluation for its health effects, each with its own Weight. The decision varied according to the relative strength assigned to each aspect: the object did not produce a simple "like" or "dislike," but a composition of values that inclined the choice.

TRANSVERSAL NOTE

NOMENCLATURE STANDARDIZATION NOTE

To investigate feeling and its relationship to the records of a trajectory, the TMC uses a shared analytical structure.

GENERAL STRUCTURE

S(feeling) ≈ Form + Texture (Weight and Valence)

This representation organizes relevant dimensions for investigating feeling. It does not seek to exhaust the complexity of the event or fully explain the subjective character of *"what it is like to have the experience,"* although a relationship exists among these dimensions. Investigation of this question, associated with *qualia*, is pursued in greater depth in **Chapter 2C — TMC Theory**.

Feeling
Refers to the character of experiencing, to the felt event itself—not merely to the capacity to have experiences. Here, it concerns feeling in its more recognizable manifestations, rather than the most subtle and ontological dimension of feeling.

Form

The reduced and/or compressed configuration of an encounter. It does not correspond to a complete photographic, auditory, or sensory reproduction. It may preserve outlines, relations, patterns, and characteristics sufficient for something to remain operable and recognizable within the trajectory.

> *Observation: Texture can exist without Form, but Form cannot exist without some degree of Texture.*

Abstraction

The process of transforming differences into operable configurations. It may include groups of signals, compressing, combining, and reconstructing elements and relations, producing composite inclinations that may participate in new encounters.

Texture

Characterizes how the encounter left its mark on the trajectory in its character as felt experience. In this representation, it is analyzed through two intrinsic dimensions: Weight and Valence.

Weight

Expresses the relative relevance and intensity with which a mark participates in operations and is recorded through them. It may be quantified for purposes of relative analysis.

Valence

Refers to the dimension of states characterized by gradations such as pleasant and unpleasant, pain and pleasure, joy and sadness, giving affective tones to what is felt.

Composite Feeling

This formula for feeling represents a distinguishable minimal unit. Complex feelings may arise from the composition of different units of feeling.

Complex, contradictory, subtle, or indeterminate emotions are structured into a composite feeling.

Representation by Polarity

The direction of Valence can be represented in simplified form by negative, neutral, or positive signs, which may also be graded numerically. This representation may help model tendencies to approach or withdraw, but it does not exhaust what is felt or automatically determine an action. It allows algorithmic analyses of states and their more effective operational manipulation.

Supplementary conceptual reference: Chapter **02c — TMC Theory**.

4.2.4 — The Resultant Vector and the Emergence of the Self

Each experience yields fragments, and each record may return Valences and Weights oriented in different directions: sight may drive one away, smell may attract, recollection may warn, and hunger may draw one closer. When these directions conflict, the problem arises of producing an operational resultant capable of guiding the next movement. In the TMC, this convergence anticipates one of the functions that will be brought together, in Chapter 7, under the concept of the Self-Entity (*Ente Eu*): **transforming multiplicity and conflict into a local direction without requiring a separate manager** within the organization itself.

Padoa-Schioppa and Assad (2006) offered monkeys two different drinks, in varying quantities: drink A, which they preferred but which was available in a small amount, and drink B, less preferred but available in a larger amount. The researchers determined how much of drink B was needed to offset the preference for drink A. Some neurons formed a single criterion for deciding which option was "worth more" to the animal. In other words, the brain could compare different things using a common scale of value.

CHAPTER 04 · BLOCK 03

4.2.5 PLASTIC MEMORY

Forgetting Also Transforms

WHAT IT IS

Traces the different fates of Form and Texture over time. Examines how remembering, forgetting, and reinterpreting can modify what remains operative.

QUESTIONS

- Can the emotional effect of an experience remain after the scene itself has disappeared?
- How do Form and Texture change or decay at different rates?
- Why is retrieving a recollection not simply a matter of opening a file?

KEY INSIGHTS

- An evaluative response can remain even when a representation of the event can no longer be retrieved.
- Form, Texture, and the link between them can be modified and reorganized.
- The chapter distinguishes empirical mechanisms from the organizational interpretation proposed by the TMC.

IN THIS BLOCK

4.2.5 Different Rates of Decay

4.2.5 — Different Rates of Decay

Every experience leaves two initially correlated dimensions:

a) Form (abstract record)

> It preserves a reduced, simplified, reusable outline of abstracted information. When seeing a car, for example, its outline, model, and enough relationships to recognize it again may remain, without the entire photograph having to be preserved.

b) Texture (vector mark)

It preserves how that record became marked for that trajectory, with its Weight and Valence. The color red may acquire negative Valence and a certain Weight; the engine power, another Valence and another Weight; the headlights may remain neutral.

At formation, Form and Texture belong to the same encounter. Over time, however, they may undergo different rates of decay and different transformations: Form may be lost while part of Texture continues to operate, and Texture may change even when Form remains recognizable.

> **When Between Turns Toward the World**

> When Between accesses the world through the senses, it does not record an indifferent photograph. The differences captured are reduced

> to a Form and leave a Texture for that trajectory. In the example of the car, both the outline that makes it recognizable and different Weights and Valences associated with its features may remain.

When Between Turns Toward Inside

Through active reflection, passive reinterpretation, or dreaming—whether examining a record of the past or constructing a hypothesis about the future—Form and Texture can be modified, dissociated, and associated again. New records can be created and old records rewritten.

In one study, Bechara and colleagues (1995) examined patients with pre-existing neurological lesions. During the experiment, a color signaled a very loud horn. One patient could explain that relationship, but their body did not learn to respond to it; another reacted bodily to the color but could not explain why. The experiment showed that knowing about an event and retaining an evaluative response to it can come apart.

Feinstein, Duff, and Tranel (2010) also showed that patients with severe amnesia could forget the sad or happy films they had watched while the emotional state those films produced remained. The scene had disappeared; its Valence still altered the present.

The Temporal Rule of Decay

Form and Texture may share an origin, but not necessarily the same trajectory. Both may decay and be rewritten, yet over different periods and with different intensities.

Every outline enters memory with some Weight; not every Weight travels through time with the outline that gave rise to it.

> **To forget is to prevent every past from competing equally for the present.**

Sekeres and colleagues (2016) observed that, over seven days, peripheral details of short films disappeared more quickly than their central structure; reminders still recovered some of what had seemed lost. Feinstein, Duff, and Tranel (2010), in turn, showed that patients with severe amnesia could forget the scenes they had watched while the sadness or joy those scenes produced remained. Memory does not decay as a single block: Form and Texture may follow different temporal trajectories.

The Link and the Plasticity of the Mind

Form preserves the abstracted information; Texture preserves how that information became marked for the trajectory. A link remains between

them, but Form, Texture, and the link itself are plastic and may decay or be rewritten at different rates.

Memory is plastic: Form and Texture may be created, undergo decay, be rewritten, become dissociated, and be associated again. The trajectory is not merely remembered: it results from a combinatorial flow continually remade within the organization itself.

Methods of Observation and the Gaps

Psychology, neuroscience, computational models, and philosophy have already described, by different routes, abstraction, affective evaluation, plasticity, reconstruction, and the temporal continuity of memory. Bartlett demonstrated its reconstructive character; Tulving and Schacter distinguished forms and operations of memory; Damasio and LeDoux investigated the role of affective evaluation; Nader and other researchers showed that a reactivated memory can become modifiable again. Computational models such as ACT-R and generative approaches sought to integrate formation, retrieval, forgetting, and reconstruction. In philosophy, Bergson and Ricoeur, among many others, examined the relations among memory, time, and identity.

These contributions, however, do not automatically constitute a single mechanism: they were produced from distinct epistemological perspectives, research methods, and objects of study.

The gap the TMC seeks to address is conceptual, temporal, and topological: what is missing is a common arrangement that tracks the record throughout the system, showing how it originates, which processes transform it, and what function it comes to perform. The aim is to reduce ontological leaps and explanatory exceptions, without seeking to reconcile or unify different systems. The point is less to oppose theories than to reframe their contributions within a common map, recognizing them as distinct from the TMC in their meanings, categories, and objects, yet methodologically legitimate and useful within their respective scopes.

> *Technical Formalization Note — The relationships presented in this chapter will be revisited formally in Chapter 10, where the TMC translates them into State, Trajectory, variables, and structural operations, making explicit, in minimal mathematical notation, the causal relationships among their parts and the operational dynamics of the Apparatus. This formalization was also developed with a computational implementation in mind, but it may provide a useful operational language for framing comparable questions and models in neuroscience. It is not intended to reduce the complexity of cognition to a set of formulas. The goal is more modest and more risky: to make explicit a minimal*

> *outline of relationships, sufficiently systematic to be quantified, qualified, compared, and, where possible, falsified.*

CHAPTER 04 · BLOCK 04

4.3 INHERITED MEMORY

A History That Precedes Our Own

WHAT IT IS

Investigates inherited dispositions that alter the conditions of an instance's first encounter. Distinguishes the transmission of organization from conscious recollection of an ancestor's experience.

QUESTIONS

- How can an organism's first encounter carry an earlier history?
- What does lineage memory transmit—and what does it not transmit?
- Why can inherited instincts provide direction without completely determining a response?

KEY INSIGHTS

- History can influence the first encounter, not only the next one.
- A lineage does not transmit lived scenes; certain inherited conditions make some responses more likely.
- The environment and learning can still modify the dispositions received.

IN THIS BLOCK

4.3.1 Lineage Memory: When the Past Precedes Individual Learning

4.3.1 — Lineage Memory: When the Past Precedes Individual Learning

The TMC calls this process memory not because the descendant possesses a recollection, but because an earlier history remains causally active in its present organization. **In individual memory, the past alters the next encounter; in lineage memory, it alters the first.**

> In individual memory, experience leaves a Record and a Mark within the instance's own trajectory. In lineage memory, part of this inclination may precede individual experience: the new instance may begin with inherited dispositions that condition the Weight and functional direction of its first encounters, even before it has constructed a Record of that object for itself. These dispositions do not amount to the transmission of Valences felt by its ancestors. Inherited memory does not transmit a photograph of the lineage's experiences; it transmits conditions under which the first encounter already meets an organization that is inclined in certain directions.

A young animal may respond to a predator with an inherited aversive inclination before possessing any recollection of that animal, without needing an image-like recollection acquired through recording during its brief individual trajectory—an abstract Form. When that encounter is felt, its Texture can be analyzed in terms of Weight and Valence; the aversive response, taken alone, does not demonstrate felt experience.

It did not inherit the image of the predator; it inherited a way of being marked by it even before the first encounter.

This is not an exotic substance or a metaphysical entity, but an inherited organization reconstructed in each new instance.

In the TMC's interpretation, instinct is one of the ways lineage memory becomes operative in the new instance. Some dispositions act as background inclinations, making certain relationships more likely across different encounters, as in dogs' early orientation toward human beings. Others remain barely visible until a specific situation activates them, as in a defensive response to certain odors or a tendency to dig under particular conditions. Still others do not provide a ready-made action, but prepare the organism to learn certain relationships more easily, as occurs during dogs' early socialization. These are neither conscious recollections nor inevitable behaviors: they are starting points that the environment and experience may still reinforce, modify, or block.

Some instincts incline the field of possibilities; others wait for the world to present the key; still others prepare the organism to learn

which key to use.

Kobayakawa and colleagues (2007) genetically eliminated a specific part of the olfactory system of mice associated with the innate defensive response. The animals could still detect aversive odors but lost their innate avoidance responses. When those odors were subsequently associated with an adverse consequence, the same animals were able to learn to avoid them through pathways that remained intact. The experiment therefore separated two operations: perceiving an odor and already possessing an innate inclination to act in response to it. In the TMC's interpretation, the signal was still arriving, but no longer encountered the previously prepared defensive direction.

> **Some instincts provide a background direction; others wait for the right signal.**

Mechanisms are already known through which certain behavioral inclinations recur across generations. They include genetic-developmental inheritance, material parental effects, and, in certain systems, germline epigenetic transmission. Social learning, imitation, and culture fall outside the scope of this discussion because they depend on group behavior and the descendant's experience. What crosses generations is not necessarily a ready-made behavior, but an organization that makes certain responses more likely and, in some cases, links specific signals to equally specific tendencies toward action.

The new instance does not receive the past as a recollection; it is reconstructed within an organization in which the past has already altered the probabilities of the present.

CHAPTER 04 · BLOCK 05

4.4 EMPIRICAL TEST

What the Evidence Shows

WHAT IT IS

Confronts the proposal with studies of reconsolidation, effects across generations, and the costs of inherited dispositions. Separates observed

results from the TMC's interpretation and prepares the transition to Between.

QUESTIONS

- Under what conditions can retrieving a memory make it modifiable?
- What effects from an earlier generation can reach the next one?
- Which conclusions do the studies support—and which do they not support?

KEY INSIGHTS

- A consolidated memory can be reopened under specific conditions.
- Inherited conditions can alter descendants' responses and also impose costs in different environments.
- Distinct findings do not demonstrate a single mechanism; the TMC proposes interpreting them through the causal activity of the past.

IN THIS BLOCK

4.4.1 Studies and Empirical Evidence

a) Remembering Can Reopen the Record

b) The First Encounter Can Have a History

c) Every Inherited Preparation Is a Bet

d) What the Evidence Allows Us to Conclude

4.4.2 Synthesis and Bridge to Between

4.4.1 — Studies and Empirical Evidence

The studies assembled below establish empirical facts that any explanation of recording must accommodate, indicating where the evidence ends and where the TMC's interpretation begins.

a) Remembering Can Reopen the Record

Retrieving a memory does not necessarily mean consulting a record that remains intact.

> Nader, Schafe, and LeDoux (2000) — Rats learned that a sound signaled a shock and began to freeze when they heard it. After this learning had already been consolidated, the researchers presented the sound again and blocked, in the amygdala, the production of proteins necessary for

> stabilizing the memory. In subsequent tests, the conditioned response had weakened. When the same blockade was applied without reactivating the memory, the memory remained preserved. The experiment shows that retrieval can make a memory modifiable again, without demonstrating that every recollection is always, or entirely, rewritten.

Retrieval is not merely locating a record. Under certain conditions, accessing it reopens the record and requires it to be stabilized again.

> **To remember is not merely to find the past; it is to put it at risk again.**

b) The First Encounter Can Have a History

> Not every difference that guides a new instance began within its own biography.

Sengupta et al. (2024) — Worms of the species *Caenorhabditis elegans* learned to avoid a pathogenic bacterium found in their natural environment. Their descendants, raised without the same exposure, displayed this avoidance for four generations. The researchers identified a small RNA produced by the bacterium, called Pv1, as a necessary and sufficient component for inducing the effect in the system studied. The experiment shows that an exposure occurring in an earlier generation can modify the descendants' first encounter, without transmitting a scene, a conscious recollection, or the behavior as a ready-made unit.

The descendant did not receive the experience lived by the previous generation. It received material conditions that changed how its own organization responded.

In individual memory, the past alters the next encounter; in lineage memory, it may alter the first.

c) Every Inherited Preparation Is a Bet

> An inherited disposition is not a universal solution: its value depends on the environment the descendant will encounter.

Burton et al. (2021) — Burton and colleagues studied, across different species of *Caenorhabditis*, the effects of infections, nutrient scarcity, and osmotic stress experienced by the parental generation. Some of these exposures prepared descendants to cope better with the same type of condition. However, when the descendants' environment did not match

that of their parents, the inherited changes could impose costs. The effects were specific and reversible and, in most of the cases examined, did not persist across many generations.

The history of a lineage does not provide advantages alone. It modifies probabilities based on earlier conditions and may benefit a descendant in one environment while harming it in another.

Lineage memory is not a storehouse of successes, but a bet on the world to come.

d) What the Evidence Allows Us to Conclude

> Taken together, the studies show three processes: a consolidated record can become modifiable again when retrieved; an instance's first encounter can carry effects of a history preceding its own biography; and an inherited preparation can provide protection under certain conditions while imposing costs under others.

These phenomena do not share the same mechanism. The TMC does not group them into a single form of memory or propose a new vehicle of transmission. In the TMC's interpretation, what brings them together is a functional property: the past remains causally active because it changes the possibilities of the present.

Inside, therefore, is not a passive archive. It is the work of organization through which records and their marks remain capable of participating in the present, becoming stabilized, reopened, and transformed—including through conditions that precede individual experience.

4.4.2 — Synthesis and Bridge to Between

Inside prevents the past from disappearing, but cannot, on its own, determine when and how what has been recorded will become operative again. A preserved record remains only a possibility as long as no present difference calls upon it. For history to participate in action again, something must access the record, compare it with the current encounter, and set it in motion.

> **Inside preserves; Between makes what was preserved operative again.**

> **Without Between, Inside stores, but does not encounter.**