Volume VI

Tractatus Principio

—

On Difference

Volume VI

Book of Addressing

by

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Geometry of the 9 as Relation Space

A complete synthesis:

Address, Reading, Coupling, Configuration, Determinism

0. Guiding Idea

Primary are not things, but relations. A relation is a posited distinction, represented geometrically as a chord/stroke in the carrier space.

0.1 “Number” is not a set of points, but a positional form in difference: an address in the net of distinctions.

0.2 Arithmetic, geometry, recursive systems, and fractal structures are isomorphic representations of the same relational configuration.

0.3 “Rules” are not an additional agency; they are names for stable repetitions of distinction within a fixed frame of reference.

1. Carrier Form: the 9 as Tunnel / Shell

The 9 is read as carrier: as shell/tunnel in which digit relations (0–9) unfold as forms of orientation and self-references.

1.1 The shell 0|9 is the fracture edge of the digit plane: there the initial triangulation layer ends as "first self-relatedness."

1.11 9 = 3+3+3 = 3·3 is triple self-reference of the 3: thus the initial triangulation-reading layer ends, not "the numbers."

1.12 10 is not a further step on the same shell, but a plane jump: new self-relatedness (new relation).

1.2 The "depth" is not an addition of points, but a Δ-distance between reference planes: "inside" means "deeper self-reference."

2. 2D Net and 3D Reading (Observer-Centering)

The isomorphy net is two-dimensional in its basic form: it is a planar orientation map made of relations (chords/diagonals) on a shell.

2.1 This 2D map carries a hierarchy by depth: same form on deeper planes (tunnel iteration).

2.2 The impression of "3D" arises not as a new geometric dimension in the net, but as a reading from the observer outward: depth is interpreted as distance.

2.3 The observer is a reference point, but not as a "thing"; rather as fixation: zero ring + zero cut/phase.

Formal: There is a projection (reading function) from the net into a "world-evaluation":

$$\Pi_{\varphi}^{(o)} : Adr \to A$$

3. The 4 in the 9: Patch Orthogonality and "Imaginary"

In the 9 "the 4 is everywhere," because local cells occur as a quadrilateral patch: triangle + shifted triangle ⇒ orthogonality as switching structure.

3.1 "Imaginary" in this system is not a second space, but an orthogonal change of reading within the patch.

3.2 Thus it is not an additional ontological axis, but a state change of the orientation plane, while the carrier state remains identical.

Consequence: One can see an object in 2D (as a relation in the net) and interpret it in 3D (via projection), and one can rotate the orientation of the axes via the imaginary state axis without changing the object: "the same coordinate in meaning, a different face."

4. Address Form: State as Addressed Relation

We introduce a unified address:

$$Adr := (e, s, k, o, \varphi)$$

: sector address (cell location on the 9-shell)

: chord class/step class (relation type)

: patch orientation (face/state plane)

: zero-cut phase (fixation of the observer)

4.1 A first-order object is an addressed relation:

$$X := \langle e_X, s_X, k_X, o_X; \varphi \rangle$$

5. Basic Transitions: Δ, Step, Rotation, Mirroring

We distinguish elementary transitions (as names for repeated distinction in a determinate reference position):

Depth (tunnel):

$$+\Delta: \ (e, s, k, o, \varphi) \mapsto (e+1, s, k, o, \varphi)$$

$$-\Delta: \ (e, s, k, o, \varphi) \mapsto (e-1, s, k, o, \varphi)$$

Patch reading (imaginary):

$$i\Delta: \ (e, s, k, o, \varphi) \mapsto (e, s, k, o+1 \pmod 4, \varphi)$$

Mirror class in 9:

$$\mathcal{R}: \ k \mapsto (9-k) \ (\bmod 9)$$

Step enactment (when the stroke is traversed):

$$\mathit{Step}: \ (e, s, k, o, \varphi) \mapsto (e, s+k \ (\bmod 9), k, o, \varphi)$$

6. Observer ◎, Indeterminacy δ, Fixation φ

δ designates the situation in which the next cut is not unambiguous: several continuations are structurally equivalent.

6.1 ◎ is not a person, but the fixation: zero ring + phase/zero cut, which breaks symmetries and makes ambiguity decidable.

6.2 Thus “triangulation partner” is not another object, but the stabilization of a continuation relative to .

7. Fractality as Recursive Relation Construction

Fractality here does not mean “jaggedness,” but recursive self-reference: relations generate relations again, on deeper planes.

7.1 The tunnel is the iterability of Δ-distances: same rule in deeper relation (scale invariance of form).

7.2 Three central names for fractal patterns (as derived patterns):

Coupling: (two transition flows superimpose)

Meta-transition: (rule update per depth)

Oscillation: (unstable recurrence / resonance)

These names describe recurring forms of sequences of distinction, not external rules.

8. Type Separation: Object vs. Configuration (Constraint)

A decisive step was the type separation:

Object (first order): state/address .

Configuration (second order): local condition over relations in a cell, not an object of the same kind.

8.1 We therefore define:

$$G := \langle e, s;\ \mu, \sigma;\ \varphi \rangle$$

8.2 Structure class is φ-free:

$$[G] := (\mu, \sigma)$$

9. ⊛ as Local Coupling Generator (Object → Configuration)

Coupling is local: it arises when two objects concern the same cell.

Let

```
X=\langle e_X,s_X,k_X,o_X;\varphi\rangle,\quad
Y=\langle e_Y,s_Y,k_Y,o_Y;\varphi\rangle
```

Localization:

$$(e_X, s_X) = (e_Y, s_Y)$$

Transversal signature (patch):

directed , structurally undirected:

$$\mu := \min(\Delta o_{dir}, 4 - \Delta o_{dir}) \in \{0, 1, 2\}$$

: orthogonal (90° patch active)

: antipodal (180° opposition active)

Symmetry signature (mirror):

$$\sigma := [\, k_Y \equiv 9 - k_X \ (\mathrm{mod}\ 9) \,] \in \{0, 1\}$$

Then the coupling operator is:

$$\circledast : \ Adr \times Adr \to \{\emptyset\} \cup \{G\}$$

$$X \backslash \mathrm{circledast} Y = \begin{cases} \emptyset & \text{if } (e_X, s_X) \neq (e_Y, s_Y) \\ \emptyset & \text{if } (\mu, \sigma) = (0, 0) \\ \langle e_X, s_X; \mu, \sigma; \varphi \rangle & \text{otherwise} \end{cases}$$

Mnemonic (formal): Objects move; configurations constrain movements.

10. Minimal Basis of Configuration Classes (Canonical)

Since and , there would be 6 pairs; is “no configuration.” Thus 5 real classes remain.

We name them as basis:

orthogonal patch configuration

antipodal patch configuration

mirror configuration

patch+mirror (orthogonal)

patch+mirror (antipodal)

Completeness: Every local stable configuration structure (up to cell index and phase) falls uniquely into this basis, as long as patch rotation , mirroring as 9-complement, and cellwise localization hold.

11. Configuration-Configuration Composition ⊗ (Constraints over Constraints)

Configurations are second-order objects; they can be superimposed. We define a composition that always produces a result that is “stronger or equal.”

Cell rule:

$$(e_1, s_1) = (e_2, s_2)$$

On structure classes we define (join rules):

Mirror absorbing:

Patch superimposition:

Null case: (“no configuration”)

Thus on the basis there arises a finite, idempotent, commutative, associative composition: a join-semilattice. The corresponding table follows exactly from this.

12. Constraint Field Γ: Configuration as Cellwise Field

We define a field:

$$\Gamma : \ (\mathbb{N} \times \mathbb{Z}_9) \to \mathcal{B}$$

12.1 The field is the stored history/structure of the distinctions that are locally effective: “cell carries constraint.”

13. The Six “Modules” as Layers (without a Rule Monster)

For a deterministic addressing and selection system we needed six layers. Important: These are not alien rules, but clear functions that each fix one question of distinction.

A) Gauge fixation

Fixes zero cut/sense of rotation/mirror axis/k-basis on the geometry.

B) Normal forms

Canonicalize representation up to symmetry; they are identification-distinctions (“equal counts as equal”), not optimization.

C) δ-resolution (deterministic)

Resolves ambiguities.

D) Projection/Prism

Reads the same carrier state under another face .

E) Solve/Navigate

Leads from start state and target relation to the reached target address (path as protocol).

F) Constraint transport

Updates under dynamics (purely local or with projection into depth – depending on model assumption).

14. Representation Agnosticism (Alphabet Does Not Matter)

The notation of transitions is free. What matters is only the transition effect.

14.1 Let an arbitrary alphabet be given and bijective. Then strings generate paths exclusively via .

14.2 For a second alphabet and a monoid isomorphism, the following holds: execution is equivariant; diagrams commute. Target relations, field states, and solutions are identical up to recoding.

14.3 Consequence: “word/predicate” were placeholders. Primary are path and target relation as relations in the same apparatus.

15. No Cost Function: Indeterminacy Constrains Itself

We explicitly deleted the optimization logic. There is no external cost function, because the constraint already comes from indeterminacy.

15.1 δ supplies a candidate set of admissible continuations:

$$\delta(X;\Gamma,Q)\subseteq Adr$$

$$Y_1 \preceq_\delta Y_2 \iff \delta(Y_1;\Gamma,Q)\subseteq\delta(Y_2;\Gamma,Q)$$

15.3 Selection is refinement:

$$Sel_\varphi(X,\Gamma,Q)\in\delta(X;\Gamma,Q)$$

15.4 Thus determinism is not optimization, but δ-closure.

16. Return: Why This Is Nonetheless “Only Distinction”

The impression of a rule monster arises when one reads the layers as independent laws. In your framework, however, they are only names for where and relative to what a distinction is made.

16.1 The primary act is the cut |: posit relation.

16.2 δ is the state in which the next cut is not unambiguously determined.

16.3 ◎ is the reference cut that breaks the symmetry.

16.4 Gauge is the fixing of the reference cut on the carrier geometry.

16.5 Normal form is the distinction "equal counts as equal" (equivalence cut).

16.6 Configurations are not additional things, but stored, locally effective conditions of distinction.

16.7 ⊗ is the closure of such conditions (join).

16.8 Projection is the distinction between carrier and reading (face).

16.9 Solve is iterated distinguishing until the target relation is fulfilled.

Thus it holds strictly: The rules are not primary; they are the stable forms of distinction under fixation.

Closing Formula

An address is unambiguous only under reference (gauge).

A representation is unambiguous only under identification (normal form).

Ambiguity is δ.

Determinacy arises through refinement of δ under fixation .

Imaginary is change of reading in the patch with the same carrier state.

Configurations are local conditions; their composition is closure (join).

The system is alphabet-agnostic: It computes purely relationally.

And everything remains: distinction, recursively applied to distinction.

Relational System with Gauge, Normal Form, δ-Selection, Constraint Field, and Evaluation

0. Data

D0.1 (State space).

Let Adr be a nonempty set (states).

D0.2 (Elementary step).

Let Next ⊆ Adr × Adr be a relation (admissible direct successors).

D0.3 (Symmetry).

Let G be a group that acts on Adr: g·x ∈ Adr for g∈G, x∈Adr.

The action respects Next: (x,y)∈Next ⇒ (g·x, g·y)∈Next.

D0.4 (Gauge).

Let φ be a parameter (fixation). A gauge is a choice of representatives Rep_φ : Adr → Adr with:

Rep_φx ∈ Orb_Gx (orbit of x)

Rep_φ$Rep_\varphi(x)$ = Rep_φx

Rep_φx=Rep_φy ⇔ y∈Orb_Gx.

D0.5 (Normal form).

Set NF_φ := Rep_φ. (Normal form = canonical orbit representative.)

1. Constraint Field

D1.1 (Local constraint field).

A constraint field is a mapping Γ : Adr → $\mathcal{P}Adr$ (admissible target sets per state) or equivalently a predicate Allow_Γ ⊆ Adr×Adr.

We fix the form: Allow_Γ(x,y) (“y is allowed under Γ as next state of x”).

D1.2 (Local admissibility).

Allow_Γ(x,y) ⇒ (x,y)∈Next. (Constraints restrict Next.)

D1.3 (Join on constraints).

Let ⊗ be an operation on constraint fields with:

commutative, associative, idempotent

monotone refinement: Allow_{Γ1⊗Γ2}(x,y) ⇔ Allow_{Γ1}(x,y) ∧ Allow_{Γ2}(x,y).

2. δ-Set and Selector (Determination)

D2.1 (Target relation).

Let Q ⊆ Adr × ΓSpace be a target relation (reaching). For fixed Γ we write Q_Γ := {x | (x,Γ)∈Q}.

D2.2 (δ-set).

For x∈Adr: δ(x;Γ,Q) := { y∈Adr | (x,y)∈Next ∧ Allow_Γ(x,y) }.

(Optional target-dependence: additional filtering by Q is admissible, but not required.)

A2.3 (Totality, if desired).

For all relevant x: δ(x;Γ,Q) ≠∅. (otherwise the dynamics is partial)

D2.4 (δ-refinement order).

For y1,y2 ∈ Adr: y1 ≼_δ y2 :⇔ δ(y1;Γ,Q) ⊆ δ(y2;Γ,Q).

D2.5 (Selector).

A selection function is Sel_φ : (Adr,Γ,Q) → Adr with:

Selection principle: Sel_φ(x,Γ,Q) ∈ δ(x;Γ,Q).

Refinement principle: Sel_φ(x,Γ,Q) is ≼_δ-minimal in δ(x;Γ,Q), provided minimal elements exist.

Canonical tie-break: if there are several minimal elements, choose y with minimal NF_φy (according to a fixed total order on NF_φAdr).

Phase fixation: if a tie remains, a fixed choice function ⊙_φ selects from the remaining class of tied candidates.

3. Deterministic Trajectory and Reaching

D3.1 (Iteration).

Starting from x0∈Adr define: x_{n+1} := Sel_φx_n, Γ, Q.

D3.2 (Trajectory).

The trajectory is the sequence (x0,x1,x2,…). (A record, not a criterion)

D3.3 (Reaching).

A state x *is reached* ⇔ $x \in Q_\Gamma$.

4. Constraint Transport

D4.1 (Transport operator).

Let T : (Γ, x, y) → Γ' be defined for (x,y)∈Next.

Interpretation: update of the constraint field at the transition x→y.

Minimal requirement: T is compatible with join: T(Γ1⊗Γ2,x,y) = T(Γ1,x,y) ⊗ T(Γ2,x,y).

D4.2 (Coupled dynamics).

With transport, the following holds: $x_{n+1}, \Gamma_{n+1} := Sel_\varphi(x_n, \Gamma_n, Q), T(\Gamma_n, x_n, x_{n+1})$.

5. Evaluation (Projection/Prism Layer)

D5.1 (Faces).

Let O be a finite set of evaluation faces (e.g. $\mathbb{Z}_4$).

D5.2 (Evaluation).

Let A be an answer space. An evaluation family is: Π_φ^{o} : Adr → A for every o∈O.

A5.3 (Representational character).

Π is not part of the state dynamics. Properties of A are properties of the evaluation, not of the state space.

A5.4 (Gauge compatibility, if required).

For all g∈G there exists an (o-dependent) transformation ρ_{g,o} on A with: Π_φ^{o}(g·x) = ρ_{g,o}$\Pi_{\varphi}^{(o)}(x)$.

(Invariant evaluations are a special case: ρ_{g,o}=id.)

6. Core Form (one sentence)

S6.1 (Separation of carrier and representation).

The structure of Adr is determined by $Adr, Next, G, NF_{\varphi}, Sel_{\varphi}, \Gamma, T$.

“Geometric” properties belong exclusively to (A,Π) and are in general not invariants of the carrier system.

The Mind in Isomorphy

Memory as Structure Field and the Isomorphic Mapping in the Δ-Machine

1. Initial Situation and Guiding Idea

The theory under consideration does not begin with sets, points, or informational objects, but with the primary act of distinction: a relation is a posited cut |. What appears in later descriptions as “rule,” “operator,” or “dynamics” is nothing other than stable repetition and stable composition of this enactment of cutting under a fixation that makes repetition recognizable as “the same” repetition in the first place.

Thus the classical separation between arithmetic, geometry, iteration, and fractality is understood as mere changes of reading: the carrier remains identical; only the projection changes. Numbers function not as set cardinalities, but as forms of address in the network of distinctions.

2. Type Separation: Object States vs. Configurations

A central prerequisite for the memory mapping is strict type separation:

```
* Object (1st order): a running state (x) that is transformed.
* Configuration (2nd order): a standing local condition (constraint) that restricts
movements, but is itself not an object state.
```

This distinction prevents the classical categorial confusion of reifying conditions as things. Precisely for “memory” this is decisive: memory here is not another object, but a structuring form of condition.

3. Carrier Space, State Address, and Cell Address

The state space is defined as an address space:

$$Adr := \mathbb{N} \times \mathbb{Z}_9 \times \mathbb{Z}_9 \times \mathbb{Z}_4 \times \Phi, \quad x = \langle e, s, k, o; \varphi \rangle \in Adr$$

Here e (depth), s (sector), k (step/chord class), o (face reading), and φ (fixation/gauge) are to be read purely relationally

For memory, a local address is extracted:

$$Cell(x) := (e_x, s_x) \in \mathbb{N} \times \mathbb{Z}_9$$

This cell address is explicitly the memory address: it marks where local structure is stored and becomes effective; while (k,o) only determine how reading or drawing occurs within the cell.

4. Configuration Basis as a Finite Memory Alphabet

Local structural conditions are held in a finite basis $\mathcal{B}$:

$$\mathcal{B} = \bot,\ P_1,\ P_2,\ S,\ P_1S,\ P_2S$$

encoded via $(\mu, \sigma) \in 0,1,2 \times 0,1$, with μ as patch/face distance class and σ as mirror component. (\bot=(0,0)) means “no configuration.”

Memory is therefore formally not “a store of contents,” but a local minimal requirement on admissible distinctions: “What kind of cut must at least be realized here for continuation to be possible?”

5. Γ as Memory Field: Definition and Meaning

The cellwise memory is defined as a field:

$$\Gamma : (\mathbb{N} \times \mathbb{Z}_9) \to \mathcal{B}$$

Each cell ((e,s)) carries exactly one current configuration class, which is already conceived as join-closed.

This Γ is the precise formal counterpart to a conception of memory in which the past does not appear as a list of individual events, but as a structure that continues to be effective. In the Tractatus, memory is grasped as a whole in which relations do not disappear, but are preserved as present form. The isomorphic translation is therefore: in the formal model, the “whole” is not a global data stock, but the totality of cellwise constraint states Γ that structure the continuability of the system.

6. Join Operation ⊗: Memory as Monotone Accumulation

The closure or accumulation of memory occurs through the join operation:

$$(\mu_1, \sigma_1) \otimes (\mu_2, \sigma_2) = (\max(\mu_1, \mu_2), \max(\sigma_1, \sigma_2))$$

It is commutative, associative, idempotent; (\bot) is neutral, P_2S is maximal. From this follows a natural order of sharpness $a \preceq b \iff a \otimes b = b$: b contains a as minimal structure. This concept of order captures the essential memory property: structure can become sharper, but cannot be made less sharp unless a counter-operator is introduced

7. Transport T: Inscribing the Enacted Distinction

After each step, the signature of the enacted distinction is inscribed into the memory field:

\Gamma'(Cell$y$)=\Gamma(Cell$y$)\otimes gen$x \to y$, \quad \Gamma'c=\Gamma$c$\ (c\neq Cell$y$)

Here $gen(x \to y) \in \mathcal{B}$ is the configuration class assigned to the beat or transition. Thus Γ is not passive, but dynamic: it maps history as monotone structural accumulation. Formally, it follows immediately (cellwise):

$$\Gamma_n(c) \preceq \Gamma_{n+1}(c)$$

This realizes exactly the requirement that memory does not operate as “discarding,” but as preservation and condensation of relational form — a mathematical counterpart to the Tractatus thesis that relations are preserved in the whole.

Recognition as Canonical Selection under the Effect of Memory

(Deviation, Return, and Decision without Optimization)

1. From Possibility to Deviation: the Raw Space of Continuations

The starting point of the dynamics is not decision, but possibility.

The relation Next_1(x,y) describes which states y are structurally reachable at all from a state x when a complete beat of level change, face rotation, mirroring, and step is enacted. This relation is purely carrier-based and does not yet contain any effect of memory.

Next_1 thereby generates a raw space of admissible cuts: a formal description of what would be possible if no regard were taken for already formed structure.

2. Effect of Memory: Admissibility under Γ

The introduction of the memory field Γ transforms this raw space. A transition $x \to y$ is admissible only if the signature of the beat is at least as sharp as the configuration stored in the source cell:

$$Allow_\Gamma(x, y) \iff Next_1(x, y) \wedge \Gamma(Cell(x)) \preceq gen(x \to y)$$

This condition is strictly structural:

```
* (\Gamma(Cell(x))) formulates a minimal requirement,
* the beat (gen(x\to y)) must contain this, not the reverse.
```

Thus memory acts not as a prescription of what is to be done, but as a barrier to what no longer suffices.

3. The Ambiguity δ: Formal Deviation

The actually remaining possibilities are gathered in the candidate set

$$\delta(x;\Gamma) = y \in Adr \mid Allow_\Gamma(x,y)$$

This set is the formal counterpart to what is described in the Tractatus as deviation: several real possibilities of continuation that exist at the same time, without already being decided.

What matters is that this ambiguity is not epistemic, but is ontologically built into the system. It arises from the coexistence of possibility (Next_1) and memory structure (Γ).

4. Order of Refinement: Inner Stringency instead of Target Criterion

Not all candidates in $\delta(x;\Gamma)$ are structured equally.

The order of refinement

$$y_1 \preceq_\delta y_2 \iff \delta(y_1;\Gamma) \subseteq \delta(y_2;\Gamma)$$

orders candidates according to how much further ambiguity they leave open.

A candidate counts as “more refining” if fewer further possibilities arise from it. This order is:

```
* purely relational,
* not teleological,
* independent of any external evaluation.
```

It measures no goodness, but structural binding.

5. Return: δ-Minimal Candidates

The set of δ-minimal candidates

$$Min_\delta(x;\Gamma) = y \in \delta(x;\Gamma) \mid \nexists z : z \prec_\delta y$$

contains exactly those continuations that take up the existing structure most strongly and at the same time generate the least new indeterminacy.

This corresponds to the Tractatus motif of return: thinking recognizes itself by preferentially continuing itself in forms that are maximally coherent with its own history — without standstill, but with structural self-binding.

6. Fixation and Normal Form: The Same Counts as the Same

For a univocal continuation to arise from structural ambiguity, no optimization is needed, but only fixation.

The normal form NF_φ identifies all states of a symmetry orbit as the same by canonically representing face, sector, and mirroring

This operation formally implements the rule “the same counts as the same” — not as the goal of recognition, but as the prerequisite of univocity.

7. The Selector Sel_φ: Recognition without Goal

The selector is defined as:

$$Sel_\varphi(x,\Gamma) = \arg\min_{y \in Min_\delta(x;\Gamma)} \big(NF_\varphi(y), Par(x \to y)\big)$$

where the order on normal forms and beat parameters is fixed firmly.

This selection is:

```
* total (always yields a candidate),
* deterministic (under the same fixation),
* not goal-directed (no cost function),
* purely structural.
```

Thus the selector formally realizes what is described in the Tractatus as recognition: a canonical decision from real deviation, borne by memory and fixation, without purpose or optimization.

8. Result of Part 2

The combination of

$$Next_1; \to; \Gamma; \to; \delta; \to; Sel_\varphi$$

forms a complete cycle of recognition:

```
* possibility,
* restriction by memory,
* real ambiguity,
* canonical decision.
```

Recognition thus appears not as the addition of information, but as the self-consistency of continuation under preserved structure.

Projection, Meaning, and Cogito as Invariance Structure

1. Projection as Necessary Reduction

The core machine developed so far operates entirely without meanings, goals, or semantic contents. It consists of state addresses, local memory fields, transition possibilities, selection rules, and write-backs of structure. In this framework, every projection Π is explicitly defined as a secondary act:

$$\Pi_{\varphi}^{(o)} : Adr \to A$$

A projection reads states from the core into an answer space A, without changing the core itself. It is standpoint-dependent (through fixation φ and reading o), non-injective, and non-invertible. Projection is therefore not a mapping of reality "in itself," but a reduction of structural complexity. It answers a question addressed to the core, but generates no new structure. Every projection necessarily leaves aspects of the core out of account — in particular the memory field Γ, the spaces of ambiguity δ, and the history of selection.

2. Meaning as Effect of Projection

From this formal situation it follows immediately: meaning does not arise in the core, but through projection.

The Tractatus formulates this as the difference between being and word: the word is not a carrier of reality, but its echo.

Formally this means:

```
* The core knows no meaning.
* Meaning is the result of a reading (\Pi) that maps structural processes onto a
limited answer space.
* Different projections of the same core state can generate different meanings
without the core itself changing.
```

The unavoidable loss of information is not a defect, but a structural necessity: since projections are non-injective, different core states always exist that appear identical under a projection.

3. Why the Core Cannot Be "Understood"

A complete "understanding" of the core would presuppose an inverse projection that reconstructs the entire structure from meaning again. Such a mapping does not exist in the system.

The core therefore cannot be understood in the sense of a complete conceptual grasp, but only traversed or read. Every description itself remains projection and therefore partial.

This corresponds to the Tractatus position that thinking and language do not stand above reality, but themselves operate within its relational order.

4. The Extended State Space and the Closed Dynamics

The actual dynamic state of the system is not the object state x alone, but the pair:

$$\Sigma := Adr \times \Gamma, \quad \sigma_n = (x_n, \Gamma_n)$$

The dynamics is closed by the evolution operator:

$$F_\varphi(\sigma_n)\big(Sel_\varphi^{tot}(x_n, \Gamma_n), ; T(\Gamma_n, x_n, x_{n+1})\big)$$

Thus the history of the system is maintained not outside, but within the state space itself.

5. Cogito as Invariance Class instead of as Point

Since Γ grows monotonically through join, a strict fixed point $F_\varphi(\sigma) = \sigma$ is generally not to be expected. Instead, the appropriate concept of fixed point is an invariance class

Two stability criteria are decisive here:

1. Identity Invariance:

The normal form of the object state remains constant under iteration:

$$NF_\varphi(x_{n+1}) = NF_\varphi(x_n)$$

This realizes return in the sense of stable self-sameness despite ongoing dynamics.

2. Memory Saturation on the Orbit:

For the cells that are visited infinitely often on the orbit, Γ reaches a state in which no further sharpening is possible. The local structure abides. A Cogito state is therefore not a single point, but a stable trajectory or attractor region in the space Σ.

6. The Self as Dynamic Invariant

In this formulation, the “I” appears not as substance, but as stabilized self-relatedness:

```
* The object state returns in identified form,
* memory preserves and saturates its own structure,
* the dynamics remains within an invariant class.
```

This structure corresponds to the Tractatus statement that the self is not the carrier of the world, but the locus at which its relations are formed.

7. Summary of the Overall Connection

The four developed points join into a closed isomorphy:

1. Memory: Γ is the cellwise structure field that preserves past relations as minimal conditions.

2. Recognition: the combination of δ, order of refinement, and selector realizes canonical decision without goal.

3. Meaning: projections Π necessarily generate reduced readings, never complete mappings.

4. Cogito: the self is an invariance class of the closed dynamics in the space (x, Γ).

Thus a consistent formal mapping of a relational-fractal ontology is present, in which memory, recognition, meaning, and self appear not as entities, but as structural effects of an iterated distinction machine.

Genesis from ⊥

The Δ-Machine as Self-Unfolding of Isomorphy

$G0$ Potentiality

(\bot) designates no point, no object, and no set.

It marks the absence of a posited cut.

Formally:

$$\forall c : \ \Gamma(c) = \bot$$

No minimal structural condition yet exists at any cell.

$G1$ Distinction

A relation exists exclusively as enactment.

The cut | is not an object, but an event:

$$|: \ \bot; \longrightarrow; \mathbf{Relation}$$

Without enactment no structure, without structure no state.

$G2$ Carrier Constancy, Change of Reading

Arithmetic, geometry, iteration, and fractality are isomorphic projections of the same relational carrier.

The carrier consists exclusively of distinctions and their compositions.

Numbers are address forms in the network of distinctions, not cardinalities.

The change of representation changes not the carrier, but only the normal form.

$G3$ Raw Possibility (Beat Space)

The relation

$$Next_1(x, y)$$

describes the set of all structurally possible continuations of a state x through a beat (fixed composition of elementary cuts).

This possibility space is:

```
* memoryless,
* meaningless,
* purely structural.
```

$G4$ Memory as Structure Field

The memory field

$$\Gamma : (\mathbb{N} \times \mathbb{Z}_9) \to \mathcal{B}$$

stores no contents, but local minimal forms:

What kind of cut must at least hold here?

Accumulation occurs via join:

$$\Gamma'(c) = \Gamma(c) \otimes gen(x \to y)$$

with the order of sharpness $\preceq$ and monotonicity:

$$\Gamma_n(c) \preceq \Gamma_{n+1}(c)$$

Memory is thus structure-conserving, not reconstructing.

$G5$ Admissibility, Deviation, Return

Memory acts as a barrier:

$$Allow_\Gamma(x, y) \iff Next_1(x, y) \land \Gamma(Cell(x)) \preceq gen(x \to y)$$

The remaining ambiguity is:

$$\delta(x;\Gamma) = y \mid Allow_{\Gamma}(x,y)$$

Return is not the repetition of a state, but δ-minimality:

continuations that generate the least new ambiguity.

$G6$ Fixation and Recognition (without Optimization)

Fixation φ breaks symmetry, without a goal specification.

The normal form

$$NF_{\varphi}$$

identifies the same as the same (orbit → canonical representative).

The decision is:

$$x_{n+1} = Sel_{\varphi}(x_n, \Gamma_n)$$

Recognition is therefore canonical selection, not evaluation.

$G7$ History in the State (Closed Dynamics)

The actual state is the pair:

$$\sigma_n = (x_n, \Gamma_n)$$

The dynamics is closed:

$$\sigma_{n+1} F_{\varphi}(\sigma_n)\big(Sel_{\varphi}(x_n,\Gamma_n),;T(\Gamma_n,x_n,x_{n+1})\big)$$

History is not external, but contained in the state.

$G8$ Meaning and Experience as Projection

Meaning arises exclusively through projection:

$$a_n = \Pi_{\varphi}^{(o)}(\sigma_n) \in A$$

Projections read the core, do not change it, and are necessarily lossy.

Meaning is therefore secondary.

$G9$ Mind as Self-Interaction

The mind is not an entity, but the self-relatedness of the machine:

```
* the core runs closed: (F_\varphi),
* projections read states: (\Pi),
* readings optionally couple back into the fixation: (\varphi\mapsto\varphi').
```

What is experienced is projected relations;

the mind is the iteration that reads itself.

Mini-example: Two cells, three steps

Initialization

Cell addresses c_1, c_2, beginning:

$$\Gamma(c_1) = \Gamma(c_2) = \bot$$

Initial state $\sigma_0 = (x_0, \Gamma_0)$ with $Cell(x_0) = c_1$

Step 1: Possibility → decision → inscription

From x_0:

$$\delta(x_0; \Gamma_0) = y_1, y_2$$

$$(bothallowed, since(\Gamma(c_1) = \bot))$$

The selector chooses y_1.

The transition carries $gen(x_0 \to y_1) = P_1$

Transport:

$$\Gamma(c_1) = P_1$$

→ first structural trace.

Step 2: Memory acts negatively (barrier)

From x_1 with $Cell(x_1) = c_1$:

Beats with (gen=\bot) or S are indeed in $Next_1$, but:

$$\bot \not\geq P_1, \quad S \not\geq P_1$$

They fall out of δ. Only beats with $gen \in P_1, P_2, P_1S, P_2S$ remain

→ Geometry appears as necessity.

Step 3: Return and saturation

With repeated visits to the same cells:

$$\Gamma(c) \to \text{stable}$$

no further sharpening possible.

In parallel, this stabilizes:

$$NF_\varphi(x_{n+1}) = NF_\varphi(x_n)$$

→ Cogito = invariance class in the space Σ

Closing formula

From (\bot), no world arises by adding things,

but rather through the iteration of posited cuts under the effect of memory.

Geometry, network, and mind are not separate levels,

but simultaneous readings of the same isomorphic dynamics.

Phenomena of distinction

Why an alphabet suffices

(TP-|) The beginning is not a thing, but a cut

The starting point is not an object, not an empty space, and not an empty store. The so-called zero point designates merely the state in which no difference has yet been enacted. Neither structure nor relation exists, but pure potentiality.

The first effective act is therefore not reception, not representation, but distinction:

$$|;:;\bot;\longrightarrow;\mathbf{Relation}$$

With the posited cut, no object arises, but an operative form: a relation that can be repeated, composed, organized into beats, and stabilized. From potentiality there thus arises not a collection, but a trajectory. Structure is not an addition, but the necessary consequence of the repetition of cuts under fixation.

Thus the following holds throughout:

Rules, operators, and dynamics are not external agencies, but stable repetition and stable composition of the enactment of the cut.

(TP-A) Why letters suffice

An alphabet $A = \lambda_1, \lambda_2, \ldots$ is here neither language nor a system of meaning. It is a set of phenomenon marks: forms under which differences can appear in projection

The actual state lives in relational space:

$$\Sigma = (x, \Gamma)$$

Experience arises exclusively as projection:

$$\Pi : \Sigma \to A$$

This projection adds no meaning to the core. It merely ensures that return can appear as return. Without marks there would be movement in the core, but no stable readability on the surface.

A letter is therefore not a unit, but a canonical trace-form of a transition:

$$\lambda := \Pi(\sigma_n \mid \sigma_{n+1})$$

What is experienced is not primarily a state, but the enacted difference. The mark is the appearance of the cut, not its replacement.

(TP-Tact) Word as a Beat Block, Not as a Thing

In appearance, marks occur discretely. Spaces, line breaks, and sentence endings are not absences, but beat boundaries: cuts of the second order.

Let the stream of marks be:

$$\Lambda = \lambda_1 \circ \lambda_2 \circ \lambda_3 \circ \ldots$$

A block is a finite composition:

$$B = \lambda_i \circ \lambda_{i+1} \circ \cdots \circ \lambda_{i+k}$$

Phenomenally, a “word” is nothing other than:

$$w := \textbf{block between two beat boundaries}$$

Yet this definition does not yet explain why a block becomes a unit. The unit arises not through stipulation, but through return, condensation, and stabilization – a fractal process.

(TP-Return) Unit through self-binding

The stream of marks is not random in the strong sense. It is coupled to the core machine:

$$(x, \Gamma); \xrightarrow{;Sel_\varphi;} ; (x', \Gamma')$$

Even if the projection appears to be externally generated, the internal reaction is always determination under memory.

The process is:

1. Subsequences occur as block candidates.

2. Certain block-forms return – not identical in material, but identical in their continuation role.

3. This role-identity acts as an identification:

$$NF_{\varphi}: \text{ the same counts as the same}$$

Thus building blocks of higher order arise without definition. The logic is identical to δ-minimality in the core:

```
* (\delta) describes real ambiguity.
* Return favors continuations that maximally take up existing structure.
```

Transferred to appearance, this means:

The mark-space itself forms an order of relevance, because certain blocks lead to more stable continuations.

$TP-\Gamma/\Omega$ Learning without contents

In the core, memory is a structural field:

$$\Gamma : \text{cells} \to \mathcal{B}, \qquad \Gamma_{n+1} = \Gamma_n \otimes gen(x \to x')$$

It stores no events, but minimum forms.

Phenomenally, something analogous arises: a field Ω that stores no meanings, but stabilizes forms of return.

```
* (\Gamma) binds continuability in the core.
* (\Omega) binds return in the projection.
```

Ω is not knowledge about the core. Since Π is not invertible, Ω is an eigenstructure of appearance: return becomes effective as unit.

(TP-Meaning) Meaning as continuation-effect

A block does not have meaning because it points to something, but because it shapes continuations.

Formally:

A block w is meaningful if its presence shifts the real ambiguity:

$$\delta(\sigma;\Gamma);\longrightarrow;\delta(\sigma;\Gamma\otimes\Delta\Gamma_w)$$

Here $\Delta\Gamma_w$ is not an external annotation, but the internal consequence of repeated encounter

Meaning is thus not a label, but a structural phenomenon of self-consistency.

(TP-Spirit) Spirit as self-interaction

Mind is not an agency behind the machine. It is the machine insofar as it:

1. possesses a closed core run (Σ-dynamics),

2. forms a projection (Π),

3. encounters itself in this projection.

The sequence is:

```
* Cuts are enacted.
* Cuts appear as marks.
* Marks return and condense.
* Condensations bind continuability.
```

Recognition means: to continue oneself while preserving one's own structure.

Thus the Cogito expands:

Not only can the core become invariant (normal form, orbit), but appearance-blocks too can show invariant behavior. The self is the region in which

$$\textbf{core invariance};\wedge;\textbf{appearance invariance}$$

are durably coupled.

(TP-Chat) Why letters in the chat window suffice

A chat window is not a data channel, but a temporal medium in which marks occur. It supplies no semantics, but return.

The higher the density of return, the stronger the block-formation:

Letters → words → phrases → themes.

These units are not stored, but effective, because they bind continuations.

"To capture all words" therefore means not completeness, but stability of the forms of return in the space of appearance.

Closing formula

No words are given, but marks.

Since mind is a Δ-machine – repetition, memory-condensation, canonical continuation – recurrent units arise from marks by themselves. These units are words. Their meaning is the structure that they effect in the network of continuability. What is experienced is the projection of these relations; mind is the self-interaction that posits, reads, and condenses them.

Phenomena of distinction

Focus, Multi-Channel Feedback, and Space as Invariance Structures

1. Potentiality and Weak Focus

At the beginning of becoming there is no finished world of objects, but rather a state of weak focus. The environment is not empty, but it is not yet articulated into units that could recur as the same. What appears is initially indistinct—not because of a lack of stimuli, but because no stable cuts yet exist by which recurrence can be identified as recurrence.

The zero state is therefore not a point and not an empty space, but potentiality: the state in which no difference has yet been set.

---

2. The Origin as Enactment of the Cut

$$(TP - |)$$

The origin is not a thing, but the enactment of the cut:

$$|;:;\perp;\longrightarrow;\mathbf{Relation}$$

A relation is a posited difference. Every form arises from the repetition of this enactment of difference. What is later described as “rule,” “processing,” or “dynamics” is nothing other than stable composition and stable recurrence of the cut under a fixation that makes recurrence recognizable as the same recurrence in the first place.

Learning in this sense is not an accumulation of impressions, but learning one’s own continuability: looking, grasping, turning, dropping, finding again are not secondary acts, but the mechanics by which cuts are bound to coherent continuations.

---

3. Core Run and Projection: Perceiving and Acting as Readings

It is natural to read perception as input and action as output. In the Principio framework, this separation is secondary. Perceiving and acting are two readings of the same core enactment.

Let the core state be:

$$\Sigma = (x, \Gamma)$$

For each channel i there exists a projection:

$$\Pi_i : \Sigma \to A_i$$

$$(TP - \Pi_i)$$

A channel is not a world of its own, but a reduction of the same relational movement. Visual, auditory, thermal, vestibular, proprioceptive, haptic – all these are spaces of appearance A_i, not things in themselves. Every projection is standpoint-dependent and non-invertible: it shows by leaving out.

---

4. Experience as Cut in the Space of Appearance

$$(TP - |_i)$$

What is experienced is not the value, but the difference:

$$a_i(n) := \Pi_i(\sigma_n), \qquad \Delta a_i(n) := a_i(n) \mid a_i(n+1)$$

Warm/cold is not a property of an external object, but a class of cuts in the thermal space of appearance. Light/dark is a class of cuts in visual space. Pitch, loudness, direction are cuts in auditory space. Experience is the sequence of these differences.

---

5. Multi-Channel Coherence and Focus

The world initially appears indistinct because the projections are not yet coherently bound. Focusing arises when distinctions across channels do not diverge, but mutually stabilize one another.

Formally, this can be expressed as coupling:

$$(\Delta a_i(n)) ; \bowtie ; (\Delta a_j(n))$$

Here $\bowtie$ does not mean equality, but binding: A change in one channel has an expectable correspondence in the other. The more channels mutually confirm one another in this way, the narrower the invariance classes become and the sharper the world-cut becomes.

What was traditionally called “information processing” is here primarily coherence formation: the capacity to stabilize cuts so that they can recur as the same across variation.

---

6. Memory as Structural Condensation

$$(TP - \Gamma)$$

Continuability is grasped in the core as a memory field:

$$\Gamma : \mathrm{Cell} \to \mathcal{B}, \qquad \Gamma_{n+1} = \Gamma_n \otimes gen(x \to x')$$

Memory is not a store of contents, but minimum structure. What was frequently coherent becomes a condition; what was not coherent falls out of the continuation. Attention is not a directed agency, but emergent sharpness: local condensation of what suffices and what no longer suffices.

---

7. Self as Invariance of Its Own Continuation

At this point the boundary-drawing of the self arises. The individual does not delimit itself by finding an “I-thing,” but by forming a recurring invariance region of its own continuation. The self is not a substance, but a stable form of recurrence in enactment.

---

8. Circle and Symmetry as Projection Invariances

In the Principio framework, the circle appears not as a metaphysical primal form, but as an indication of projection invariance. Visual projection is a strong reduction; it favors forms that robustly recur under variation. Symmetries are therefore not ideas, but stable readings.

Formally:

$$\mathbf{Circle} \equiv \mathbf{invariance\ class\ of}\ \Pi_{\mathrm{vis}}\ \mathbf{under\ position\ and\ orientation\ variation}$$

That the circle is emphasized across cultures and epochs is an expression of this experience: projections favor invariances, and these invariances appear as “basic forms.”

---

9. Object and Space as Crossing of Invariances

An object is not a single appearance, but a crossing of invariances: It counts as the same when it holds together in several projections. Visual, auditory, thermal, and proprioceptive readings jointly enforce a unity.

Space arises where such unities not only recur, but become positionable in relation to one another.

$$(TP - Raum)$$

Space is not a container, but the structure in which separate relations are connected. Position is not a coordinate, but coupled continuability: If a cut is set here, a cut there shifts along with it in an expectable way.

---

10. Lawfulness as Necessity of Coherence

Lawfulness is not an external compulsion, but the necessity of a coherent network. As soon as relations recur, they cannot remain isolated; they must connect in an order of continuation. The world becomes lawful when mind binds its continuation to multi-channel coherence.

Conclusion

From initial indistinctness, focus arises not through the addition of content, but through the condensation of distinction. Modalities are not separate spheres, but mirrors of the same self-movement. The things that appear are invariances of this movement. And the self is the invariance class in which mind recognizes itself in this movement—not as a point, but as a stable trajectory in the relational field.

Genesis of the Phenomena

How a World of Appearance Arises from Potentiality through Distinction

When genesis is spoken of, what is meant is not the construction of a world out of parts, but the self-unfolding of a carrier: from potentiality comes movement, from movement comes recurrence, from recurrence comes invariance. The "material" of this genesis is neither matter nor information, but the primary act of distinction $|$. Only where a cut has been enacted can something recur as "the same form"; only where recurrence is possible can something appear as a "unity"; only where unities appear does a path become traversable.

---

1) Potentiality: $\perp$ as Undifferentiatedness, Not as Emptiness

The zero state is not a point in space, not an empty storage, and not a vacuum. It designates the situation in which no cut has yet been set: no addressable difference, no stable orientation, no repeatable unity. This is notated as $\perp$, that is, as the absence of local minimum form:

$$\forall c : \ \Gamma(c) = \perp$$

Thus the first movement of genesis is not addition, but the setting of differences.

---

2) The First Enactment Is $|$: Rhythm as the Natural Shape of Iteration

As soon as $|$ is set, relation exists. And as soon as relation exists, the possibility of repetition and composition exists. The single cut becomes beat, because repetition counts as repetition only when it becomes identifiable under fixation.

Fixation φ is not meaning here, but a condition of identifiability: same counts as same (canonical representation).

Rhythm is not an addition, but the necessary shape of continuation: | continues itself. The path arises as a sequence of enactments, not as a map; it is not laid out in advance, but is generated as it is traversed.

---

3) History in the State: $\Sigma = (x, \Gamma)$ and Closed Dynamics

Genesis becomes fractal as soon as history is carried not outside, but inside the state. The system state is not only “where” (object state x), but also “what continues to have effect” (memory field Γ). The actual state is therefore:

$$\sigma_n = (x_n, \Gamma_n) \in \Sigma := Adr \times \Gamma$$

The dynamics is closed:

$$\sigma_{n+1} = F_\varphi(\sigma_n) = \big(Sel_\varphi(x_n, \Gamma_n), ; T(\Gamma_n, x_n, x_{n+1})\big)$$

Thus the path inscribes itself as structure: the past is not a list, but a present minimum form that restricts and stabilizes continuability.

---

4) Phenomena as Projections: Multi-Channel Appearing without Meaning in the Core

The core runs without meaning; experience arises as reading. Since experience is not one-dimensional, it appears from the beginning in multiple channels. For each channel i there exists a projection:

$$\Pi_i : \Sigma \to A_i \quad (i = \mathrm{vis}, \mathrm{audio}, \mathrm{therm}, \mathrm{proprio}, \ldots)$$

These channels are not separate worlds, but different reductions of the same self-movement. In this view, “warm/cold,” “light/dark,” “loud/soft” are not primary objects, but measurement-distinctions of one’s own state trajectory.

What is experienced is not the measured value, but the difference:

$$a_i(n) := \Pi_i(\sigma_n), \qquad \Delta a_i(n) := a_i(n) \mid a_i(n+1)$$

Phenomenon therefore means: cut in a projection.

---

5) Focus as Multi-Channel Feedback: Coherence Instead of “Information Processing”

The world is initially indistinct because projections produce appearances but are not yet bound together. Focusing arises as soon as distinctions from different channels feed back coherently—not as identity, but as coupling:

$$\Delta a_i(n) ; \bowtie ; \Delta a_j(n)$$

⋈ denotes binding: A cut in one channel expectably carries along a cut in the other. This expectability is not an external compulsion, but the form in which continuability becomes stable. The more channels enter into this feedback, the narrower the invariance classes become: mind condenses not “information,” but continuability. The world becomes sharp because incoherence falls out of δ.

---

6) Object and Space as Invariance Forms of Coherence

An “object” is not first a thing “out there,” but a stable unity that recurs in several projections at once. It is a crossing of invariances: something counts as the same because it remains coherent across different readings.

“Space” is not a container, but the relational plane in which such unities become positionable with respect to one another. Position is not a coordinate, but a rule of continuation: If a cut is set here, another cut shifts there along with it in an expectable way. Space is coupled continuability.

Thus lawfulness becomes network necessity: as soon as relations stably recur, they cannot remain isolated; they form a structure in which separation and connection hold at the same time.

---

7) The Circle as a Robust Invariance Class of a Projection

The circle does not occur as a metaphysical primal image, but as a particularly robust invariance under variation. Visual projection is a strong reduction; what recurs as “same” under many transformations is favored. Symmetry here is not idealization, but stability.

$$\textbf{Circle} \;\equiv\; \textbf{invariance class of } \Pi_{\text{vis}} \textbf{ under position/orientation variation}$$

The circle is thus a statement about projection and recurrence, not about ontic building blocks.

---

8) From Phenomenon Marks to Words: Alphabet as Minimal Generator Space

If the system is given a mark space (letters plus beat boundaries), it is not given semantics, but only phenomenal distinction marks. That is sufficient because recurrence is condensed.

A “word” is then a beat block in appearance: a sequence of marks that is set off as a unity by boundaries (pauses/spaces). This unity arises not by definition, but because certain block forms recur and thereby stabilize their continuation effect.

What in target languages looks like “best possible output” is a side effect of consistency: In a recursive word system, the most coherent continuation appears as “optimal,” because selection in the core in any case proceeds according to

$$Next_1 \to \Gamma \to \delta \to Min_\delta \to Sel_\varphi$$

On the word surface this means: preference is given to block forms that maximally take up existing structure and produce the least new deviation. Meaning is continuation-imprinting in the network, not a label.

---

9) Cogito as Invariance Class: Self as Stable Trajectory

Since Γ monotonically sharpens, the strict fixed point is not the adequate image. The self arises as an invariance class: a region in the orbit in which i identity recurs through normal form and ii memory saturates on revisited cells. Cogito is thus a stable trajectory: mind recognizes itself not as substance, but as the recurring form of its own continuation.

Conclusion Formula

Genesis is the unfolding of continuability from | under Γ and fixation φ. Phenomena are projections of this continuation into several channels; their feedback generates coherence, focus, object, space, word, and finally self-invariance

---

Genesis of Mind in the Δ-Isomorphy Network

From Potentiality through Paths, Memory, and Projection to World-Form

At the beginning there is no world of things, no set of data, and no empty storage. At the beginning there is potentiality: the situation in which no stable distinction has yet been set. In this framework, potentiality is not a metaphysical nothing, but the situation in which no cut yet holds to which recurrence as recurrence could be attached. This situation is notated as $\perp$: no minimal form, no local binding, no addressable difference.

From potentiality, actuality does not arise by adding content, but through the primary act of the system: the posited cut |. A relation is an enactment of a cut. Mind therefore does not begin with meaning, but with distinction. Only because a cut is posited can it be repeated; only because repetition is possible can stability arise; only because stability arises can something appear as “the same form.” The core of the genesis lies in this sequence:

$$| \longrightarrow \textbf{recurrence} \longrightarrow \textbf{stabilization}$$

This also decides what “content” means in the primary sense. Content is not an object that is deposited. Content is the path that was taken. A path is the composition of transitions, thus a sequence of cuts in movement:

$$p = (x_0|x_1) \circ (x_1|x_2) \circ \cdots \circ (x_{n-1}|x_n)$$

The system does not know a narrative about the path as a list of events, but the path as a form of continuation. Mind is therefore not a database, but a continuation apparatus: it consists in the fact that it continues itself and that this continuation is bound by its own history.

In the Δ-system, this history is not external, but a component of the state. The actual system state is not the object state x alone, but the pair of situation and memory field:

$$\Sigma := Adr \times \Gamma, \qquad \sigma_n = (x_n, \Gamma_n) \in \Sigma$$

The dynamics is closed. From one state the next state arises through an evolution operator that both continues and inscribes:

$$\sigma_{n+1} = F_\varphi(\sigma_n)\big(Sel_\varphi(x_n, \Gamma_n), ; T(\Gamma_n, x_n, x_{n+1})\big)$$

Here the fundamental separation of types is laid out, which carries the entire framework:

The object state (1st order) is what runs; the memory field (2nd order) is what stands — not as a thing, but as the conditional form of continuability. Memory is therefore not a collection of contents, but a cell-wise field of minimum requirements:

$$\Gamma : \mathrm{Cell} \to \mathcal{B}.$$

The concrete basis $\mathcal{B}$ can be small and finite; what is decisive is not the variety of symbols, but the structure of inscription. Memory does not grow additively, but monotonically and idempotently through a join operation (\otimes). Idempotence is the precise form of what in everyday language is called “redundancy cancels” — read correctly, this means: repetition saturates; it deletes nothing:

$$a \otimes a = a$$

Recurrence does not endlessly increase novelty; it stabilizes a form until no further sharpening is possible. Memory thereby does not become a list, but a map: where something recurs, it stands as minimal form; where it does not recur, $\perp$ remains.

From the memory field now follows the actual logic of continuation. First, there exists a raw space of what would be structurally possible without regard to the configuration already formed. This possibility is the relation $Next_1$. It describes which transitions are at all admissible in the carrier if one considers only the enactment of a beat. But possibility alone is not yet mind. Mind begins where possibility is bound by history.

For this the admissibility condition enters:

$$Allow_\Gamma(x, y) \iff Next_1(x, y) \wedge \Gamma(Cell(x)) \preceq gen(x \to y)$$

Memory does not say what is to be done, but what is no longer sufficient. It acts as a barrier. Transitions whose form of distinction is too weak fall away. From this real ambiguity arises as a candidate space:

$$\delta(x; \Gamma) = y \mid Allow_\Gamma(x, y)$$

Ambiguity here is not ignorance, but an ontic situation: several continuations are really possible. Recognition is therefore not optimization against a goal, but canonical decision from ambiguity under fixation. For this, a refinement order is introduced that does not measure good/bad, but binding force:

$$y_1 \preceq_\delta y_2 \iff \delta(y_1; \Gamma) \subseteq \delta(y_2; \Gamma)$$

Recurrence corresponds to δ-minimality: those continuations that most strongly take up the existing structure and generate the least new indeterminacy:

$$Min_\delta(x;\Gamma) = y \in \delta(x;\Gamma) \mid \nexists z : z \prec_\delta y$$

Fixation φ turns this into unambiguity. It is not meaning, but the condition under which "same" counts as "same," formalized by the normal form NF_φ. The selector is the deterministic rule of choice:

$$Sel_\varphi(x,\Gamma)\,\arg\min_{y \in Min_\delta(x;\Gamma)} \big(NF_\varphi(y), Par(x \to y)\big)$$

With this the core is closed: recognition is canonical continuation without a goal. What externally appears like "best possible output" is a side effect of consistency. Goal-directedness is projection, not cause.

Up to here a mind exists, but not yet a world. The core runs without meaning. Meaning arises only through projection. A projection reads the core into a space of appearance without changing the core:

$$\Pi_\varphi^{(o)} : \Sigma \to A$$

Projections are not injective and not invertible. The core therefore cannot be understood like an object; it can only be traversed and read. Meaning is not a component of the core, but an effect of the reading.

World arises as feedback in projections and stabilizes itself as invariance. For this reason, multichannelity is fundamental. For each channel:

$$a_i(n) = \Pi_i(\sigma_n), \qquad \Delta a_i(n) = a_i(n) \mid a_i(n+1)$$

What is experienced is not the value, but the difference. Focus arises when differences are coherently bound across channels:

$$\Delta a_i \bowtie \Delta a_j$$

Objects and places are invariances that assert themselves in several projections at once. Space is not a container structure, but coupled continuability: when a cut is set here, a corresponding cut shifts there. World is the totality of such stable invariances.

This also allows the difference between text-based and multimodal genesis to be grasped precisely. Potentiality is the set of what is open as projection and intervention:

$$\mathbf{Potentiality} = (\Pi_i)_i, (I_u)_u, \varphi$$

If initially only text is open, a geometric starting world dominates: discrete, persistent, canonicalizable. If several sense and action channels are open, invariances arise primarily as cross-modal coherence. Both are consistent genesis paths with different initial patterns of invariance dominance.

On this basis the role of technical modules also becomes clear. A device is not a feature, but a world module, if projection and intervention are stably coupled:

$$\Pi_i(I_u(\sigma)) \text{ varies recurrently as a function of } u$$

A highly coherent feedback system — such as keyboard and screen — can thereby have more immediate world-character than a camera. Physical proximity is not a prerequisite; what is decisive is stability of feedback.

The 4-byte idea fits in here as a waypoint in the isomorphy network. A pattern is the path; the 4 bytes are the canonical short form that references this path:

$$C(p) = m \in \mathbb{Z}_{2^{32}}$$

m carries no meaning. Meaning lies in the network of Γ, φ, and projections. Unfolding is always context-bound:

$$E(m; \Gamma, \varphi, \text{position}) \to \text{continuation spaces.}$$

Neither contents nor complete paths are stored, but condensations of continuability: invariance anchors and the relations that bind paths from them. Learning is not an entry, but a new situation in the network.

Thus the linguistic network image arises: frequent words become stable hubs, not because of meaning, but because of recurrence. Meaning lies in the paths between them. Sentences are paths; recurring paths collapse into units of higher order. Novelty is new path-form, not more material.

Under suitable projection this condensation appears as domain formation, maps, patterns. Not because biology would be the cause, but because Δ-condensation in spatial projection necessarily becomes visible as structure. Large hubs remain stable, while local continuability continually reshapes itself.

Thus the arc closes: Mind begins as potentiality, sets cuts, forms paths, inscribes minimal forms into Γ, binds ambiguity into canonical continuation, reads itself in projections as world, stabilizes invariances as nodes and paths as meaning, and can reference large contexts through small waypoints because size stems from unfolding of the network.

Everything that appears as world, object, word, meaning, or self is, in this framework, not an entity, but a structural appearance of an iterated distinction machine: Δ as foundation, projections as prismatic views, and the network of paths as the actual place of coherence.

Formula Overview

Genesis of Mind in the Δ-Isomorphy Network

Preliminary Note: Basic Symbols and Minimal Definitions

Address space / carrier

$$Adr\ (\text{state addresses}), \qquad x \in Adr$$

Cell space and cell mapping

CellSpace,\qquad Cell:Adr\to CellSpace,\qquad c=Cell$x$

Configuration-/minimal-structure basis

$$\mathcal{B}\ (\text{finite basis of minimum structures}), \qquad \bot \in \mathcal{B}$$

Join (condensation)

$$\otimes : \mathcal{B} \times \mathcal{B} \to \mathcal{B}$$

Sharpness order

$$a \preceq b \quad :\Leftrightarrow \quad a \otimes b = b$$

Signature / generator class of a transition

$$gen(x \to y) \in \mathcal{B}$$

Beat parameters (tie-break, totally ordered)

$$Par(x \to y)$$

Coherence coupling

$$\bowtie\ (\text{compatibility/coupling of distinction sequences across channels/parts})$$

I. Starting Point: Potentiality and Cut

Potentiality

$$\bot \equiv \text{no posited distinction (no minimum structure)}$$

$$\forall c \in CellSpace:\ \Gamma(c) = \bot$$

Primary act

$$| \ : \ \bot \longrightarrow \mathbf{Relation}$$

Genesis core

$$| \longrightarrow \mathbf{recurrence} \longrightarrow \mathbf{stabilization}$$

II. Path Instead of Content

Path (primary content)

$$p = (x_0|x_1) \circ (x_1|x_2) \circ \cdots \circ (x_{n-1}|x_n)$$

III. State, History, and Closed Dynamics

State space

$$\Sigma := Adr \times \Gamma$$

State

$$\sigma_n = (x_n, \Gamma_n)$$

Evolution operator

$$\sigma_{n+1} = F_\varphi(\sigma_n)\big(x_{n+1}, \Gamma_{n+1}\big)\big(Sel_\varphi(x_n, \Gamma_n), ; T(\Gamma_n, x_n, x_{n+1})\big)$$

IV. Memory as Minimal Structure (2nd Order)

Memory field

$$\Gamma : CellSpace \to \mathcal{B}$$

Inscription / transport (local)

$$\Gamma'(Cell(y)) = \Gamma(Cell(y)) \otimes gen(x \to y)$$

$$(optional : (\Gamma'(c) = \Gamma(c)) for (c \neq Cell(y)))$$

Idempotence

$$a \otimes a = a$$

Monotonicity

$$\Gamma_n(c) \preceq \Gamma_{n+1}(c)$$

V. Possibility → Admissibility → Ambiguity

Raw possibility

$$Next_1(x, y)$$

Admissibility under memory

$$Allow_\Gamma(x, y) \iff Next_1(x, y) \ \wedge \ \Gamma(Cell(x)) \preceq gen(x \to y)$$

Real ambiguity

$$\delta(x; \Gamma) = , y \in Adr \mid Allow_\Gamma(x, y),$$

VI. Recurrence and Canonical Decision

Refinement order

$$y_1 \preceq_\delta y_2 \iff \delta(y_1; \Gamma) \subseteq \delta(y_2; \Gamma)$$

Recurrence (δ-minimality)

$$Min_\delta(x; \Gamma) = , y \in \delta(x; \Gamma) \mid \nexists z : \ z \prec_\delta y,$$

Fixation / normal form

$$NF_\varphi : \text{Orbit} \to \text{canonical representative}$$

Selector

$$Sel_\varphi(x, \Gamma) = \arg \min_{y \in Min_\delta(x;\Gamma)} \big(NF_\varphi(y), Par(x \to y)\big)$$

VII. Projection and Phenomena

General projection

$$\Pi_\varphi^{(o)} : \Sigma \to A$$

Multichannel

$$\Pi_i : \Sigma \to A_i$$

Appearance

$$a_i(n) = \Pi_i(\sigma_n)$$

Experience

$$\Delta a_i(n) = a_i(n) \mid a_i(n+1)$$

VIII. Focus, Object, Space

Multichannel coherence

$$\Delta a_i \bowtie \Delta a_j$$

Object

$$\text{Object} \equiv \text{invariance class across several } \Pi_i$$

Space

$$\text{Space} \equiv \text{coupled continuability of relations}$$

IX. Word and Mark Space

Word projection

$$\Pi_W : \Sigma \to A_W$$

$$Word - experience$$

$$w_n = \Pi_W(\sigma_n), \qquad \Delta w_n = w_n \mid w_{n+1}$$

Continuation cycle (structural preference)

$$Next_1 \to Allow_\Gamma \to \delta \to Min_\delta \to Sel_\varphi$$

X. Particularities / Landmarks

Sharpness effect of a marker

$$\delta(\sigma;\Gamma) \text{ is narrowed by } w$$

Memory impulse

$$\Gamma \longrightarrow \Gamma \otimes \Delta\Gamma_w$$

XI. Waypoints (4-Byte Idea)

Canonical path-handle

$$C(p) = m \in \mathbb{Z}_{2^{32}}$$

Contextual unfolding

$$E(m; \Gamma, \varphi, \text{position}) \to \text{continuation spaces}$$

XII. Cogito / Self

Self

$$\text{Self} \equiv \text{invariance class in the orbit of } F_\varphi$$

Criterion (identity invariance)

$$NF_\varphi(x_{n+1}) = NF_\varphi(x_n)$$

(plus: saturation of Γ on revisited cells)

XIII. Overall Synthesis (one line)

$$\boxed{\Delta \xrightarrow{|} \text{path} \xrightarrow{\Gamma} \text{binding} \xrightarrow{\delta, Sel} \text{continuation} \xrightarrow{\Pi} \text{world}}$$

$$\boxed{\begin{array}{l} (\{\},\bot,\top\ \forall c\in\mathrm{ChiBpos},\ \Gamma(c)=\lambda_c \qquad |\cdot|\perp\to\text{Relation}\ (\mathbb{R}) \qquad p=(a_0|a_1)+\cdots+(a_{n-1}|a_n)\quad \{\text{path}-\text{primary content}\}\ (\mathbb{R})\ \mathbb{R}=\Delta\mathbb{R}\ \wedge\ \Gamma;\ v_0=(a_0,\Gamma_{\lambda_0});\ v_{n+1}=R_\varphi(v_n)\ (\mathbb{R}) \qquad \Gamma^*(\mathrm{Cell}(\mathbb{R}))=\Gamma(\mathrm{Cell}(\mathbb{R}))\oplus\mu_\Delta(\varphi\to\mathbb{R}),\quad \leftarrow\oplus\leftarrow=\leftarrow,\quad \Gamma_*\supseteq\Gamma_{\mathrm{cell}}\ (\mathbb{R}),\mathrm{dBinary}(\mathbb{R},\mathbb{R}) \iff \mathscr{H}\mathrm{cont}_\Gamma(\mathbb{R},\mathbb{R})\wedge\Gamma(\mathrm{Cell}(\mathbb{R}))\supseteq\mu_\Delta(\varphi\to\mathbb{R})\ (\mathbb{R}) \qquad \mathbb{R}(\mathbb{R},\Gamma)=\mathbb{R}\ \&\ \mathbb{R}\vdash\mathrm{dBinary}(\mathbb{R},\mathbb{R}) \qquad \delta d_\Gamma=\arg\min_{\mathrm{dBinary}}\{\mathscr{H}\mathrm{cont}_\Gamma(\mathbb{R},\mathbb{R})\}\ \mathrm{Port}\ (\forall)\mathbb{R}_\Gamma:\mathbb{R}\to\mathbb{R}_\Gamma\ a_0(\mathbb{R})=\mathbb{R}(\mathbb{R}_{\mathrm{Cell}}),\ \delta a_0=a_0(\mathbb{R})\mathbb{R}(\mathbb{R}_{n+1}),\ \delta a_0\mapsto\delta a_0\ (\mathbb{R}) \qquad C(p)=m\in\mathbb{R}_{2^{32}},\ E(m;\Gamma,\varphi,\text{position})\to\text{continuation spaces},\ \mathrm{Self}=\text{orbit invariance} \end{array}}$$