

On Symbolic Registration

**Measurement, Re-registration, and the Generonic
Foundations of Language**

Kevin R. Haylett

Full Draft Monograph
July 2026

Exposition status and scope

This is a full conceptual initial exposition developed within the Geofinite and Finite Symbolic Mechanics framework. Its first purpose is to establish the missing lineage between interaction, measurement, symbol, reading, modelling, and symbolic continuation. It is written as a monograph rather than a compressed paper so that the argument can remain unfoldable. Definitions and equations are therefore accompanied by prose that retains the conditions under which they are meaningful.

The text deliberately develops its internal framework before attempting an exhaustive historical comparison. References to established philosophical, linguistic, mathematical, and scientific traditions are kept provisional in this draft. A later revision can add detailed provenance and a formal bibliography without allowing inherited terminology to obscure the central argument.

Abstract

Every symbol available to thought, language, mathematics, and scientific modelling must first become symbolically instantiated. Yet the transition by which an interaction becomes a symbol is usually compressed into words such as observation, perception, reading, data, or information. These terms conceal the physical and historical process through which a finite distinction crosses a generonic boundary and becomes available within the symbolic realm.

This monograph develops **registration** as the finite symbolic instantiation produced when an exogenous interaction crosses a generonic boundary. Registration does not denote a transparent copy of a world existing beyond measurement. It denotes the stabilised symbolic result of an interaction involving an apparatus, organism, or other distinction-making system. Once instantiated, a registration may be stored, compared, transformed, modelled, communicated, and incorporated into a Functional Symbolic Trajectory.

The related concept of **re-registration** provides a missing foundation for reading, listening, symbolic transmission, and cultural continuity. When a person reads, they perform an exogenous measurement upon symbols that have already been externally registered. The resulting symbols are newly instantiated within the reader's own symbolic landscape. Reading is therefore not the transfer of an abstract meaning from text to mind, but the re-registration and reconstruction of a previously registered symbolic trajectory.

The framework distinguishes primary exogenous registrations from endogenous symbolic derivations, and it shows how scientific and philosophical accounts commonly conflate measured registrations, derived quantities, interpretive models, and claims about the world beyond measurement. It also provides a finite account of symbolic persistence without requiring an abstract type existing independently of its physical instances. A symbol persists historically through a lineage of sufficiently related registrations and re-registrations.

Registration is connected to the Alphonic Limit, uncertainty, provenance, symbolic compression, Functional Symbolic Trajectories, the generonic boundary, semantic reconstruction, and a Takens-based interpretation of language. The resulting framework positions language as a physically instantiated, dynamically renewed system of symbolic registrations rather than a transparent channel through which fixed meanings travel.

Contents

Exposition status and scope	iii
Abstract	v
I The Missing Event	1
1 You Are Reading These Words	3
1.1 An apparently simple sentence	3
1.2 The word does not enter the reader	4
1.3 Familiarity hides the measurement	4
1.4 A text is a structured opportunity	5
1.5 The opening lineage	5
2 The Compression Hidden in Ordinary Language	7
2.1 Compression is unavoidable	7
2.2 Compression can change the apparent phenomenon	7
2.3 The hidden equality sign	8
2.4 Compression and symbolic drag	8
2.5 The disciplined use of compression	9
2.6 Compression as a diagnostic	9
II Registration and the Generonic Boundary	11
3 The Generonic Boundary	13
3.1 A boundary of availability	13
3.2 The generonic operation is conditional	13
3.3 Not a transparent window	14
3.4 Distributed boundaries	14
3.5 The Generon	15
3.6 A boundary that creates responsibility	15
4 Registration	17
4.1 Naming the missing event	17
4.2 Event and residue	17
4.3 A registration is not a representation	18
4.4 Registration and the finite symbol	18

4.5	Registration is selective	19
4.6	The Alphonic condition	19
4.7	Why the word matters	19
5	The Anatomy of a Registration	21
5.1	Beyond the bare mark	21
5.2	The mark	21
5.3	The registering arrangement	21
5.4	Conditions and duration	22
5.5	Alphonic constraint and uncertainty	22
5.6	Provenance	22
5.7	Admissibility	23
5.8	Registration thickness	23
5.9	Registration drag	23
III	Re-registration	25
6	Re-registration as Renewed Symbolic Instantiation	27
6.1	The missing continuity mechanism	27
6.2	No symbol travels unchanged	27
6.3	Re-registration is indexed	28
6.4	Modalities of re-registration	28
6.5	Copying is a chain of re-registrations	29
6.6	Re-registration and change	29
7	Reading as Exogenous Measurement	31
7.1	Placing reading	31
7.2	The layered reading event	31
7.3	Familiar words	31
7.4	Unfamiliar words	32
7.5	The role of expectation	32
7.6	Reading conditions	33
7.7	Reading as measurement, not metaphor	33
8	Registration, Recognition, and Reconstruction	35
8.1	Three compressed processes	35
8.2	Registration without recognition	35
8.3	Recognition as basin entry	35
8.4	Recognition without complete registration	36
8.5	Reconstruction	36
8.6	Continuation	36
8.7	Why the distinction matters	37

IV	Symbolic Persistence Without Abstract Types	39
9	The Symbolic Lineage	41
9.1	Persistence without an abstract type	41
9.2	Basin membership	41
9.3	A family made by use	42
9.4	Copying and drift	42
9.5	The politics of admissibility	42
9.6	A finite replacement for type and token	43
10	Re-reading and the Changing Reader	45
10.1	The text appears stable	45
10.2	The first reading changes the second	45
10.3	The book that changes	46
10.4	Rereading as measurement continuation	46
10.5	Commentary and changed basins	46
10.6	The impossibility of a final reading	46
11	Memory, Recall, and Endogenous Reconstruction	49
11.1	Not every recurrence is re-registration	49
11.2	Memory is not a store of identical tokens	49
11.3	Reading, recall, and expression	49
11.4	Recognition can be retrospective	50
11.5	Memory and symbolic continuity	50
11.6	The finite honesty of remembering	50
V	Writing, Speech, and Communication	53
12	Writing as External Registration	55
12.1	The outward movement	55
12.2	Projection into a line	55
12.3	The writer becomes a reader	55
12.4	What is omitted	56
12.5	A text is a new generonic object	56
12.6	Authorship and finite responsibility	56
13	Speech and Listening	57
13.1	The acoustic registration	57
13.2	Temporal dependence	57
13.3	Noise and prediction	57
13.4	Conversation as coupled dynamics	58
13.5	Gesture and multimodal registration	58
13.6	The physical lineage of dialogue	58

14 Why Meaning Is Not Transferred	59
14.1 The container metaphor	59
14.2 Constraint without transfer	59
14.3 Why misunderstanding is normal	59
14.4 Not unrestricted interpretation	60
14.5 Repair as iterative measurement	60
14.6 The practical value of the distinction	60
15 The Reader Is the Author	63
15.1 A careful claim	63
15.2 Two forms of authorship	63
15.3 The role of prior history	63
15.4 The text resists	64
15.5 Authorship as responsibility	64
15.6 Co-authorship across time	64
VI Functional Symbolic Trajectories	65
16 From Registration to Functional Symbolic Trajectory	67
16.1 The symbol in motion	67
16.2 Local registration and relational function	67
16.3 Trajectory is not a path through an abstract space	67
16.4 Trajectory thickness	68
16.5 Functional halting	68
16.6 Registration lineage and trajectory	68
17 Semantic Thickness and Overlapping Basins	69
17.1 The thickness of a word	69
17.2 Uncertainty is constitutive	69
17.3 Context does not eliminate history	69
17.4 Metaphor as basin coupling	70
17.5 Contested definitions	70
17.6 Semantic metrics	70
17.7 Thickness as strength	70
18 Registration and Takens Reconstruction	71
18.1 The measured sequence	71
18.2 Meaning in the curvature	71
18.3 Expectation as local geometry	71
18.4 Attention as pairwise embedding	72
18.5 Basins and training	72
18.6 The logit decoder as registration generator	72
18.7 A shared temporary attractor	72

VII	Scientific Registration	75
19	Instruments, Data, and the First Registration	77
19.1	The instrument participates	77
19.2	The apparatus is a generonic geometry	77
19.3	Analogue response and symbolic threshold	77
19.4	Data are already registrations	78
19.5	Nested registrations	78
19.6	The observer's re-registration	78
19.7	Measurement as interactional stabilisation	79
20	Derived Symbols Are Not New Measurements	81
20.1	The decisive distinction	81
20.2	A taxonomy of scientific symbols	81
20.3	The Planck length as an example	81
20.4	Precision can conceal distance from measurement	82
20.5	Prediction is not registration	82
20.6	Why the distinction improves science	83
21	Registration, Model, and World	85
21.1	The recurrent crossing	85
21.2	Model invariance and world invariance	85
21.3	The model as a stabilising instrument	85
21.4	When models become nouns	86
21.5	The world beyond symbolic measurement	86
21.6	New measurements change the symbolic world	86
22	Scientific Reading as Re-registration	87
22.1	The paper is not the experiment	87
22.2	Figures as generonic compressions	87
22.3	The authority of compressed prose	87
22.4	Reading a result critically	88
22.5	Reproducibility as lineage reconstruction	88
22.6	The reader as a scientific instrument	88
VIII	Text-within-Text	89
23	The Symbolic Realm as Renewed Physical Instantiation	91
23.1	Text is not an immaterial container	91
23.2	The recursive generonic chain	91
23.3	Digital symbols remain physical	91
23.4	Text acts through re-registration	92
23.5	No final symbolic foundation	92
23.6	The role of exogenous renewal	92

24 Cultural Continuity as Re-registration	93
24.1 Culture does not store meaning unchanged	93
24.2 Tradition as a basin	93
24.3 Archives preserve registrations, not the past itself	93
24.4 Loss and silence	94
24.5 Revival is new construction	94
24.6 Cultural responsibility	94
25 Translation as Cross-basin Re-registration	95
25.1 No identical semantic cargo	95
25.2 Languages partition differently	95
25.3 The translator as reader and writer	95
25.4 Provenance and visible uncertainty	96
25.5 Multiple admissible translations	96
25.6 Machine translation	96
IX Formal Foundations	97
26 A Preliminary Calculus of Registration	99
26.1 Purpose and limits	99
26.2 Primary registration	99
26.3 Re-registration	99
26.4 Registration update	100
26.5 Recognition	100
26.6 Functional Symbolic Trajectory	100
26.7 Endogenous derivation	100
26.8 Prediction and comparison	101
26.9 Compression	101
26.10A finite caution	101
27 Principles of Symbolic Registration	103
27.1 The role of principles	103
27.2 Principle I: Finite instantiation	103
27.3 Principle II: Generonic origin	103
27.4 Principle III: Registration non-identity	103
27.5 Principle IV: Re-registration non-identity	103
27.6 Principle V: Historical relatedness	104
27.7 Principle VI: Registration precedes representation	104
27.8 Principle VII: Derived symbols are not registrations	104
27.9 Principle VIII: Compression removes trajectory	104
27.10 Principle IX: Reading is re-registration	104
27.11 Principle X: Meaning is reconstructed	104
27.12 Principle XI: Provenance is constitutive	104
27.13 Principle XII: Re-registration changes the system	104
27.14 Principle XIII: Model-world distinction	105
27.15 Principle XIV: Exogenous renewal	105

27.16	Principle XV: Finite admissibility	105
27.17A	a compact statement	105
X	Consequences and Applications	107
28	Implications for Linguistics and Philosophy of Language	109
28.1	Before semantics	109
28.2	The sign is a lineage	109
28.3	Reference as modelled continuation	109
28.4	Rules as registered practices	109
28.5	Private language and public lineage	110
28.6	The philosophical gain	110
29	Implications for Education and Learning	111
29.1	Learning as basin construction	111
29.2	Why isolated definitions fail	111
29.3	Repetition and variation	111
29.4	Error as basin evidence	111
29.5	Reading instruction	112
29.6	Technical education	112
30	Implications for Artificial Language Systems	113
30.1	Machine registration	113
30.2	Tokenisation as compression	113
30.3	Training as basin shaping	113
30.4	Endogenous output and exogenous checking	114
30.5	Hallucination as unsupported continuation	114
30.6	The model as instrument	114
31	Implications for Scientific Language	115
31.1	Grammar can cross the boundary silently	115
31.2	A vocabulary of lineage	115
31.3	Examples of reformulation	115
31.4	Plain language and precision	116
31.5	Scientific disagreement	116
31.6	The discipline of not knowing	116
32	Registration in Geofinitism and Finite Symbolic Mechanics	117
32.1	The missing layer	117
32.2	Connection to the five pillars	117
32.2.1	Finite symbol	117
32.2.2	Alphonic Limit	117
32.2.3	Uncertainty	117
32.2.4	Provenance	118
32.2.5	Admissibility and consensus	118
32.3	Connection to symbolic drag	118

32.4 Connection to Functional Symbolic Trajectories	118
32.5 Connection to text-within-text	118
32.6 Connection to the Takens-Based Transformer	118
32.7 A foundational contribution	118
32.8 The world does not enter as text	119
Glossary of Central Terms	121
Notation	123
Core Registration Diagrams	125
.1 Primary registration	125
.2 Re-registration	125
.3 Writing and reading	125
.4 Scientific lineage	125
.5 Symbolic lineage	125
.6 Registration, recognition, and reconstruction	125
.7 Model testing	125
Worked Examples	127
.8 Reading a familiar word	127
.9 Encountering a new technical term	127
.10 A damaged manuscript	127
.11 Re-reading a childhood book	127
.12 A spoken sentence in noise	127
.13 A scientific instrument output	128
.14 A derived physical scale	128
.15 A language model response	128
.16 Translation	128
.17 Legal quotation	128
Historical and Research Orientation	129
.18 Signs and interpretation	129
.19 Meaning as use	129
.20 Information and communication	129
.21 Embodied and enactive approaches	129
.22 Measurement theory	129
.23 Dynamical systems and language	130
.24 Takens and delay embedding	130
.25 Type and token	130
.26 Future research programme	130
Closing statement	131

Part I

The Missing Event

You Are Reading These Words

The ordinary act of reading is already a measurement experiment, repeated so fluently that the experiment disappears.

1.1 An apparently simple sentence

You are reading these words. The sentence appears to describe something immediate and uncomplicated. Marks are present, the eyes move across them, and an understanding seems to arise. Ordinary language compresses the whole event into a verb: *reading*. We rarely stop to ask what must physically and symbolically occur before that verb can be used.

The words remain outside the reader. On a printed page they are regions of ink and paper. On a screen they are patterns maintained by an electronic display. In Braille they are differences of material relief. In speech they are temporal variations in a pressure field. None of these external arrangements is identical with the symbolic trajectory eventually reconstructed by the reader or listener. They provide a structured interaction through which finite distinctions may be produced.

The first movement is therefore not the arrival of meaning. It is a measurement:

$$\text{external mark} \longrightarrow \text{interaction with reader} \longrightarrow \text{finite distinction.} \quad (1.1)$$

The distinction must be physically supported. It must last long enough, differ sufficiently from its surroundings, and enter a system capable of retaining or acting upon it. Only then can the mark participate in a locally available symbolic trajectory.

Proposition

Reading begins as an exogenous measurement. The object measured is already symbolic in its historical provenance, but it remains external to the present reader until a new local symbolic instantiation occurs.

1.2 The word does not enter the reader

It is tempting to imagine that the word on the page moves into the mind. This picture is reinforced by phrases such as “taking in a sentence”, “receiving a message”, and “extracting information”. Yet the printed mark does not leave the page. Nor is there an abstract semantic parcel that can be observed moving from one place to another.

A new event occurs within the reader. The external arrangement perturbs a sensory and historical system. The resulting local symbol is related to the external mark, but it is not physically identical with it:

$$S_{\text{page}} \neq S_{\text{reader}}. \quad (1.2)$$

Their relation is better written as a measured and context-dependent similarity:

$$S_{\text{page}} \sim_{\mathcal{A}} S_{\text{reader}}, \quad (1.3)$$

where $\mathcal{A}$ denotes the admissibility conditions under which the two finite registrations are treated as continuations of the same symbol. The relation is neither arbitrary nor exact. The shapes on the page constrain what can reasonably be registered, while the reader’s prior history constrains what can be recognised and continued.

This is the first place where the framework requires a new word. The external mark has previously been produced as a symbol. The reader measures it and produces a new local symbolic event. That event is a **re-registration**.

1.3 Familiarity hides the measurement

Most words in this paragraph do not feel newly measured. They appear immediately as words. This immediacy is not evidence that measurement has been bypassed. It is evidence that repeated earlier registrations have formed deep and efficient recognition basins.

For a familiar word S , a new registration R_t may rapidly enter an established basin $\mathcal{B}_S$:

$$R_t \longrightarrow \mathcal{B}_S. \quad (1.4)$$

The process is so well practised that its stages become unavailable to ordinary attention. Distinguishing the shape, grouping the letters, locating the lexical form, coupling the form to prior uses, and projecting likely continuations all occur within one compressed experience. We say, “I read the word.”

An unfamiliar term reveals more of the hidden machinery. The marks may be visible and reproducible, yet no stable semantic continuation is available. A reader may register the letters, attempt a pronunciation, identify the item as word-like, and still be unable to place it within a meaningful trajectory. The graphical registration has occurred, but recognition and semantic reconstruction remain incomplete.

This difference will later allow us to distinguish registration, recognition, and reconstruction. At this opening stage it is enough to notice that the apparent simplicity of reading depends on a large history that has been compressed into fluency.

1.4 A text is a structured opportunity

A text is not a container filled with meaning. It is a physically maintained arrangement capable of constraining successive acts of registration. Its order matters. Its spacing matters. The medium matters. The reader's history matters. The surrounding context matters. A text supplies a sequence of structured opportunities for symbolic reconstruction:

$$R_1, R_2, \dots, R_n \longrightarrow \hat{\mathcal{T}}_{\text{reader}}. \quad (1.5)$$

The reconstructed trajectory $\hat{\mathcal{T}}_{\text{reader}}$ is neither freely invented nor passively received. It is locally authored under constraint. The marks restrict possible trajectories, but they cannot place a complete trajectory inside the reader.

This is why the same sentence can be clear to one person and opaque to another. It is why a technical term can become transparent after months of use. It is why a childhood book appears to change when read later in life. The external registration may remain relatively stable while the registering system changes.

1.5 The opening lineage

The first task of this monograph is therefore to restore the lineage hidden inside the single word *reading*. In its simplest form:

$$\begin{array}{l} \text{external registration} \rightarrow \text{exogenous interaction} \rightarrow \text{generonic crossing} \\ \qquad \qquad \qquad \rightarrow \text{re-registration} \rightarrow \text{trajectory reconstruction} \end{array} \quad (1.6)$$

Every later chapter will unfold one part of this sequence. The result will be a finite account of language in which symbols do not float between minds, meanings are not transported as invisible objects, and reading is not treated as direct access to a symbolic store. Language remains physically instantiated at every stage, while its functional continuity is carried by related trajectories of registration and re-registration.

Diagnostic question

When a text is said to “contain” meaning, which physical and symbolic stages have been compressed out of the description?

The Compression Hidden in Ordinary Language

2.1 Compression is unavoidable

Language could not function if every use of a symbol required the speaker to reproduce its complete physical, historical, and social lineage. A single technical word may condense centuries of measurement, dispute, institutional practice, and changing usage. A common word may condense an even longer and less recoverable history. Compression is therefore not a defect added to language. It is one of the conditions under which language remains usable.

The Geofinite concern begins when compression is forgotten. A shortened expression is then treated as though it were a complete description. The omitted trajectory no longer appears as omitted. It disappears from the apparent structure of the claim.

Consider the familiar account:

$$\text{writer writes a sentence} \rightarrow \text{reader understands it.} \quad (2.1)$$

This compact relation conceals a much longer process:

$$\begin{aligned} \text{writer's prior registrations} &\rightarrow \text{endogenous symbolic trajectory} \\ &\rightarrow \text{motor or technical externalisation} \rightarrow \text{persistent external marks} \\ &\rightarrow \text{reader's exogenous measurement} \rightarrow \text{re-registration} \\ &\rightarrow \text{recognition} \rightarrow \text{trajectory reconstruction} \rightarrow \text{new continuation.} \end{aligned} \quad (2.2)$$

The compressed statement is not false for ordinary use. It becomes misleading when it is taken as a foundational model of communication.

2.2 Compression can change the apparent phenomenon

A shortened account does more than remove detail. It can create entities and relations that are not present in the unfolded process. Once the writer, message, and reader are placed in a linear diagram, it becomes natural to imagine a semantic object passing through a

channel:

$$M_A \rightarrow \text{message} \rightarrow M_B. \quad (2.3)$$

The message appears to carry meaning in the way a container carries a substance. Encoding and decoding then seem sufficient to explain communication. Yet the physical lineage contains no observed transfer of a stable semantic object. There is an external registration and a later re-registration. The two symbolic systems are changed through related interactions.

The unfolded relation is closer to:

$$\mathcal{T}_A \rightarrow R_{\text{external}} \rightarrow R_B \rightarrow \mathcal{T}_B. \quad (2.4)$$

The relation between $\mathcal{T}_A$ and $\mathcal{T}_B$ is constrained similarity rather than identity:

$$\mathcal{T}_A \sim \mathcal{T}_B. \quad (2.5)$$

The appearance of semantic transfer is therefore partly an artefact of compression.

2.3 The hidden equality sign

Ordinary language repeatedly describes physically different registrations as “the same word”. This is functional and often necessary. The marks *cat*, handwritten on paper, printed in a book, displayed on a screen, and heard as sound are treated as instances of one word. Yet no physical identity joins them.

The compressed claim is:

$$S_1 = S_2 = S_3. \quad (2.6)$$

The finite claim is:

$$S_1 \sim_{\mathcal{A}} S_2 \sim_{\mathcal{A}} S_3. \quad (2.7)$$

The tilde retains the fact that symbolic identity is measured, historical, and purpose-dependent. It permits strong stability without requiring a dimensionless type outside all registrations.

This is a recurring Geofinite operation. Equality often suppresses the measurement conditions under which two finite outcomes are treated as equivalent. The suppression is useful until a foundational argument is built upon it. At that point the missing conditions return as paradox, ambiguity, or disagreement.

2.4 Compression and symbolic drag

Let a full registration be represented schematically by

$$R = (m, A, C, \tau, \alpha, \delta, H, \mathcal{A}), \quad (2.8)$$

where m is the visible mark, A the registering apparatus or system, C the conditions,

τ the finite duration, α the local Alphonic constraint, δ the uncertainty, H the provenance, and $\mathcal{A}$ the admissibility regime.

An ordinary symbolic compression may retain only the mark:

$$\text{Comp}(R) = m. \quad (2.9)$$

The rest of the trajectory has not become physically irrelevant merely because it is absent from the expression. We can represent the omitted lineage heuristically as

$$D_R = R \setminus \text{Comp}(R). \quad (2.10)$$

D_R is not a conventional numerical difference. It names the registration drag carried by what has been removed. In practice, this drag appears when the mark is transported to a new context, compared under a different apparatus, interpreted by a different community, or treated as exact beyond its uncertainty.

Proposition

Compression removes explicit trajectory, not consequence. The omitted conditions remain capable of altering later registrations and reconstructions.

2.5 The disciplined use of compression

The aim is not to abolish compression. A language in which every word carried its full provenance on every occasion would collapse under its own weight. The practical requirement is weaker and more useful:

A symbolically admissible compression should retain, in principle, an unfoldable lineage to the registrations from which it was formed.

The lineage need not always be recovered. It must remain conceptually available when disagreement, uncertainty, or model failure requires it. This is why scientific method depends upon notebooks, calibration records, apparatus descriptions, data provenance, and repeated measurement. These practices are attempts to make compressed results unfoldable.

The same requirement applies to language. A definition should be capable of returning to examples of use. A historical claim should return to surviving registrations. A mathematical quantity should return to the operations and marks by which it was formed. A model should return to the measurements that constrain it.

2.6 Compression as a diagnostic

Throughout this monograph, a simple diagnostic will be used:

Diagnostic question

What trajectory has been compressed into this noun, number, equation, or claim, and what changes when that trajectory is restored?

Registration is the first answer. It names the event that is commonly removed before symbolic reasoning even begins. Re-registration names the repeated event removed from accounts of reading and communication. Together they make visible the physical renewal on which the apparent continuity of language depends.

Part II

Registration and the Generonic Boundary

The Generonic Boundary

3.1 A boundary of availability

The **generonic boundary** names the transition through which an interaction becomes locally available as a symbol. It is not necessarily a line or surface in ordinary geometry. In a simple instrument it may be associated with a threshold crossing, a mark on a scale, or a detector event. In an organism it may be distributed across sensory, neural, bodily, and learned processes. In a social institution it may include procedures by which a registration is accepted, stored, and made usable by others.

The word *boundary* therefore indicates a change of functional status. Before the crossing, the interaction is not yet available to the symbolic system in the form later used. After the crossing, a finite distinction can enter comparison, storage, narration, mathematics, or action.

Let $\mathcal{X}$ denote an exogenous interactional domain and $\mathcal{S}_A$ the symbolic domain locally available to system A . A first schematic representation is

$$G_A : \mathcal{X} \longrightarrow \mathcal{S}_A. \quad (3.1)$$

This expression must not be read as a claim that G_A copies the structure of $\mathcal{X}$. It indicates only that an interaction participates in the production of a locally available symbolic result.

3.2 The generonic operation is conditional

A fuller relation is

$$R_A = G_A(I \mid A, C, \tau, \alpha, \delta, H, \mathcal{A}), \quad (3.2)$$

where I is the interaction, A is the registering arrangement, C the conditions, τ the finite duration, α the local Alphonic requirement, δ the uncertainty, H the provenance, and $\mathcal{A}$ the rule set by which the result is treated as a registration.

The notation makes several commitments visible.

First, the registration is generated by the whole arrangement, not by a supposed object alone. Second, a registration is temporally and spatially finite. Third, the result carries uncertainty and provenance from its formation. Fourth, symbolic availability depends upon an admissibility practice. A fluctuation below a threshold, a blurred mark, or a reading

outside an instrument's calibrated range may participate physically in the interaction but fail to become an accepted registration.

3.3 Not a transparent window

The generonic boundary is sometimes implicitly treated as transparent. A measurement is imagined to transport a property from the world into a symbolic value. This picture is attractive because it preserves the idea that the measured quantity existed in exactly the registered form before measurement.

The present framework does not require that assumption. It begins with the interaction and the resulting distinction:

$$I \longrightarrow R, \quad (3.3)$$

not with a guaranteed copy relation:

$$\text{pre-existing symbolic property} \longrightarrow \text{identical measured symbol}. \quad (3.4)$$

A temperature reading, a visual edge, a pulse count, or a written word may be stable and useful without being a miniature duplicate of a structure beyond the measurement. The registration is what the generonic arrangement can sustain.

Proposition

The generonic boundary does not import the world into the symbolic realm. It produces a finite distinction through interaction.

3.4 Distributed boundaries

In many cases no single point can be identified as the complete boundary. A camera image depends on optics, sensor material, exposure duration, analogue conversion, digital thresholds, file encoding, display hardware, and later viewing. Each stage may include further registrations and compressions.

The generonic boundary can therefore be nested:

$$I \rightarrow R_1 \rightarrow R_2 \rightarrow \cdots \rightarrow R_n. \quad (3.5)$$

The first detector response may be a registration for one subsystem and an exogenous input for the next. The final number in a data file may be several generonic and symbolic transformations removed from the originating interaction.

This nested structure is not a reason to abandon the concept. It is precisely why the concept is needed. It prevents a late-stage symbolic output from being mistaken for an unmediated encounter with the world.

3.5 The Generon

The term **Generon** may be used for a finite arrangement capable of producing symbolic registrations from interactions. A Generon need not be conscious. A camera, counter, biological receptor, trained reader, and scientific institution can each perform generonic functions at different scales.

A Generon is characterised by at least four capacities:

1. it participates in an interaction;
2. it distinguishes some outcomes from others;
3. it stabilises a finite result;
4. it makes that result available for continuation.

The distinction-making capacity is always selective. No Generon registers everything involved in an interaction. Its geometry, thresholds, materials, history, and admissibility conditions shape what can cross.

3.6 A boundary that creates responsibility

Once a registration is understood as generonically produced, provenance becomes constitutive rather than decorative. We must ask not only what number or word was recorded, but how it became available. The conditions of crossing form part of the result's identity.

This has ethical and scientific importance. A registration made by a medical instrument, a legal witness, a language model, or a historical archive cannot be responsibly detached from its generonic conditions. The visible symbol may be identical while the lineage differs radically.

The generonic boundary therefore marks both a physical transition and a responsibility boundary. It is the place in the account where the conditions of symbolic creation must be acknowledged.

Registration

4.1 Naming the missing event

The term **registration** is familiar in science and technology. A detector registers a pulse. A camera registers light. A seismograph registers movement. A clock registers elapsed intervals. Its ordinary use already implies interaction, threshold, persistence, and a resulting mark. This makes it unusually well suited to the Geofinite framework.

Definition

Registration is the finite symbolic instantiation produced when an interaction crosses a generonic boundary and becomes available for storage, comparison, interpretation, or further symbolic transformation.

A compact form will be used repeatedly:

Registration is the generonic event by which an interaction becomes a finite symbol.

The definition is intentionally modest. It does not state that the symbol is a perfect representation of an independently existing object. It states that a finite distinction has become symbolically available.

4.2 Event and residue

Registration refers both to an event and to its persisting result. A detector *registers*; the resulting mark is *a registration*. The noun carries a compressed verb within it.

This dual use is not a defect. It preserves the fact that the apparently stable symbolic object is the residue of a process. In the language of slow verbs, a registration is an interaction that has become sufficiently slow and stable to function as a noun.

$$\text{registration as object} \approx \text{stabilised history of registering.} \quad (4.1)$$

The stability is finite. The mark may decay, be erased, lose its context, become illegible, or cease to be admissible. Its noun-like form does not remove its temporal history.

4.3 A registration is not a representation

The words *registration* and *representation* must be kept distinct.

A registration is produced through an interaction. A representation is an endogenous symbolic judgement that one or more registrations stand for something, relate to something, or can be organised under a model.

The order is:

$$\text{interaction} \rightarrow \boxed{\text{registration}} \rightarrow \text{representation} \rightarrow \text{model}. \quad (4.2)$$

This does not mean that the stages are always consciously separated. In fluent practice they may be compressed into one act. A skilled observer may see a trace and immediately name a phenomenon. The conceptual order nevertheless matters. The trace must be available before it can be interpreted as a representation.

Proposition

Registration precedes representation. A finite distinction may be registered even when no stable interpretation or model is yet available.

This is common in science. An anomalous instrument output may be recorded before its cause is understood. It is also common in reading. A glyph may be seen and copied without being recognised.

4.4 Registration and the finite symbol

Registration and symbol are closely related but should not be treated as exact synonyms. A **finite symbol** is any locally instantiated element available within the symbolic realm. A registration is a symbol whose lineage explicitly includes a generonic crossing.

Every registration is symbolic, but not every symbol is a fresh exogenous registration. A number derived from earlier measurements is symbolically instantiated, yet it may be entirely endogenous to the symbolic system.

We can write:

$$R_e : \text{exogenous registration}, \quad (4.3)$$

$$S_d : \text{endogenous derived symbol}. \quad (4.4)$$

A scientific trajectory may then take the form

$$R_{e1}, R_{e2}, \dots, R_{en} \longrightarrow S_{d1}, S_{d2}, \dots \longrightarrow M, \quad (4.5)$$

where M is a model. The distinction will become central when examining quantities that are mathematically derived but spoken of as though directly measured.

4.5 Registration is selective

What is registered is never the entirety of an interaction. A photodetector may respond to a narrow range of interactions and compress a complex event into a count. A reader may distinguish a word while failing to notice its typeface, paper texture, or surrounding visual field. A microphone may preserve some pressure variation while losing direction, room geometry, and bodily context.

Thus:

$$R \neq I. \quad (4.6)$$

The registration is a finite symbolic residue that the registering system can sustain. Its selectivity is not necessarily a flaw. It is what permits a distinction to stabilise. Yet the selectivity must be remembered when the registration is later used to make claims about the originating interaction.

4.6 The Alphonic condition

For a registration to function, it must remain distinguishable within its local medium. It must meet an **Alphonic condition**. Schematically:

$$R \succeq \alpha_A, \quad (4.7)$$

where α_A is the minimum local condition under which registering system A can sustain the distinction.

This is not a universal point-like minimum. It depends on geometry, material, duration, noise, contrast, history, and admissibility. A distinction too small or unstable for one system may be registerable by another. The Alphonic condition names the finite requirement for symbolic existence within a particular generonic arrangement.

4.7 Why the word matters

Without registration, measurement can appear to leap directly from world to model. With registration, the intermediate event becomes visible:

$$\text{world-interaction} \not\rightarrow \text{model directly}; \quad \text{interaction} \rightarrow R \rightarrow \text{symbolic continuation}. \quad (4.8)$$

The word therefore provides more than terminology. It creates a disciplined stopping point. Before moving from a measurement to an interpretation, we can ask what was actually registered, under which conditions, and with what uncertainty. This one pause can prevent a symbol from being silently promoted into the world beyond symbolic measurement.

The Anatomy of a Registration

5.1 Beyond the bare mark

A registration is often stored as a bare number, word, image, or binary state. This is useful, but it hides the conditions that made the mark possible. A value such as

$$3.7 \tag{5.1}$$

is not, by itself, an adequate scientific registration. It lacks unit, apparatus, context, time, uncertainty, and provenance. Even a word detached from its sentence and source has undergone a similar loss.

A fuller registration may be written schematically as

$$R = (m, A, C, \tau, \alpha, \delta, H, \mathcal{A}) . \tag{5.2}$$

The tuple is not intended as a final ontology of measurement. It is a reminder that the visible mark is the compressed face of a thicker event.

5.2 The mark

m is the finite symbolic output. It may be a numeral, word, image region, pointer position, sound category, count, or stored machine state. The mark has physical extent. Even when represented mathematically as a dimensionless element, its actual availability depends on a substrate.

The mark is what later symbolic operations commonly retain. It is also what most readily loses its lineage. Once copied into a table or equation, it may appear self-sufficient.

5.3 The registering arrangement

A denotes the apparatus, organism, or institutional arrangement that participates in registration. It includes more than the final sensor. Optics, thresholds, calibration procedures, software filters, trained observers, and accepted protocols can all belong to the registering arrangement.

A change in A may produce a different registration from what appears to be the same interaction:

$$\text{Reg}(I \mid A_1) \neq \text{Reg}(I \mid A_2). \quad (5.3)$$

This relation is one reason why cross-instrument comparison requires calibration rather than assumption.

5.4 Conditions and duration

C gathers local conditions such as temperature, orientation, background, medium, surrounding text, and social setting. τ denotes the finite interactional or integration interval.

Duration is especially easy to suppress. A camera exposure, a counter interval, a spoken word, and an act of reading all require time. An “instantaneous event” is generally a compressed description of a registration whose duration is small relative to the chosen scale.

Proposition

No registration is literally extensionless. Every registration occupies a finite physical and temporal region, even when the model later treats it as a point.

5.5 Alphonic constraint and uncertainty

α represents the local condition for distinguishability. δ represents the uncertainty carried by the registration. These are related but not identical.

The Alphonic condition concerns whether a distinction can be sustained at all. Uncertainty concerns the thickness, range, overlap, or instability of the resulting distinction. A registration may be clearly present while its value remains uncertain. Conversely, a model may assign a sharp value to a distinction that no apparatus can actually register.

The notation

$$R = (m \pm \delta) \quad (5.4)$$

is often too thin, because uncertainty is not always a symmetric numerical interval. It may include semantic ambiguity, spatial spread, temporal jitter, model dependence, and provenance loss. The broader symbol δ should therefore be understood as a finite uncertainty structure rather than merely an error bar.

5.6 Provenance

H denotes the history by which the registration came to exist. Provenance includes who or what registered it, which transformations it underwent, how it was stored, whether it was copied, and what earlier registrations shaped its interpretation.

Provenance is not optional metadata attached after the event. It forms part of the registration’s identity. Two visible marks may be graphically identical while carrying radically different histories:

$$(m, H_1) \neq (m, H_2). \quad (5.5)$$

This is obvious in law, archival work, and experimental science, but it is equally true of ordinary language. The same sentence uttered as a joke, threat, quotation, or instruction does not form the same functional registration.

5.7 Admissibility

$\mathcal{A}$ denotes the rules by which a registration is accepted as usable within a symbolic practice. A laboratory may reject a reading outside calibration. A language community may reject a mark as illegible. A court may reject evidence without a chain of custody. A model may reject a data point as an outlier.

Admissibility is therefore neither purely physical nor purely subjective. It is a historically formed relation between finite registrations and the practices that use them.

5.8 Registration thickness

The complete registration has thickness:

$$\text{Thick}(R) = \{m, A, C, \tau, \alpha, \delta, H, \mathcal{A}\}. \quad (5.6)$$

Ordinary symbolic use projects this thickness into a thinner mark:

$$\text{Comp}(R) = m. \quad (5.7)$$

The compression is often necessary. Problems arise when m is later treated as though it retained all properties of the full registration.

5.9 Registration drag

The omitted lineage can be represented heuristically as

$$D_R = \text{Thick}(R) \setminus \text{Comp}(R). \quad (5.8)$$

Registration drag becomes visible when a compressed mark is moved across contexts. A number copied without its unit, a quotation separated from its conversation, or a statistical result detached from its measurement process each carries hidden drag. The mark continues to function, but its apparent precision exceeds its retained lineage.

The practical lesson is not that every use must carry the full tuple. It is that foundational claims should remain capable of returning to it.

Part III

Re-registration

Re-registration as Renewed Symbolic Instantiation

6.1 The missing continuity mechanism

Registration explains how an interaction becomes a locally available symbol. It does not yet explain how symbols appear to persist across readers, media, generations, and machines. The ordinary answer invokes copying, transmission, or repeated instances of an abstract type. Each answer compresses the physical renewal that makes continuity possible.

The missing mechanism is **re-registration**.

Definition

Re-registration is the generonic event through which an externally instantiated symbol becomes newly instantiated within another symbolic occasion or system.

The compact formulation is:

Re-registration is exogenous in event but symbolic in ancestry.

The event is exogenous because the relevant mark lies outside the present registering system. Its ancestry is symbolic because the mark was produced through an earlier registration.

6.2 No symbol travels unchanged

Let R_A be an external registration produced by system A . When system B reads, hears, scans, or otherwise measures it, the result is

$$R_B = G_B(R_A \mid C_B, \tau_B, \alpha_B, \delta_B, H_B, \mathcal{A}_B). \quad (6.1)$$

The original registration does not physically enter B . A new registration is formed:

$$R_A \neq R_B. \quad (6.2)$$

Yet they may be functionally related:

$$R_A \sim_A R_B. \quad (6.3)$$

This relation provides a finite account of symbolic continuity. The continuity lies in admissible relatedness across a lineage, not in the movement of an unchanged abstract object.

6.3 Re-registration is indexed

A symbol may be old historically and new locally. Let

$$R(S \mid A, t) \quad (6.4)$$

denote the registration of symbol S by system A at time t . A word may have been registered throughout a culture for centuries while being encountered by one reader for the first time:

$$R(S \mid \text{community}, t_0) : \text{historically established}, \quad (6.5)$$

$$R(S \mid \text{reader}, t_1) : \text{locally new}. \quad (6.6)$$

The same event is therefore a re-registration relative to the historical lineage and a first registration relative to the reader's local repertoire.

This resolves an apparent tension. A new technical term on a page has clearly been written before the reader sees it, but the reader must still form a new local symbolic basin. Novelty is always novelty for a specified system at a specified level.

6.4 Modalities of re-registration

Re-registration is not limited to visual reading. It can occur through multiple modes:

$$R_v : \text{visual re-registration}, \quad (6.7)$$

$$R_a : \text{auditory re-registration}, \quad (6.8)$$

$$R_t : \text{tactile re-registration}, \quad (6.9)$$

$$R_m : \text{machine-mediated re-registration}, \quad (6.10)$$

$$R_s : \text{socially ratified re-registration}. \quad (6.11)$$

A spoken word may be re-registered auditorily. Braille may be re-registered through touch. An optical character recognition system may re-register printed marks into machine tokens. A legal document may become socially active only after a further institutional registration such as signing or filing.

The modalities differ physically, but the structural relation remains:

$$\text{prior symbol} \rightarrow \text{new exogenous interaction} \rightarrow \text{new local symbol}. \quad (6.12)$$

6.5 Copying is a chain of re-registrations

A copy is often treated as an identical reproduction. Finite copying is better described as a chain:

$$R_1 \rightarrow R_2 \rightarrow \cdots \rightarrow R_n. \quad (6.13)$$

Each step involves a new medium, threshold, apparatus, or act of reading. Differences may remain below the relevant recognition boundary, allowing the copy to function as the same text. Over longer chains, small changes can accumulate, contexts can be lost, and admissibility can shift.

This account applies equally to manuscripts, digital files, oral traditions, and model training corpora. Apparent symbolic persistence is the achievement of repeated material renewal.

6.6 Re-registration and change

Every re-registration changes the registering system, however slightly. The new symbol becomes part of its subsequent history:

$$H_{B,t+1} = H_{B,t} \cup \{R_B\}. \quad (6.14)$$

The notation is schematic, but the point is important. A reader after reading is not identical to the reader before reading. A model after an update is not identical to the earlier model. A culture after preserving a text has also interpreted, selected, and situated it.

Proposition

Re-registration is not passive replication. It is a locally transformative event in a historical symbolic system.

This proposition will be central to re-reading, learning, conversation, and cultural continuity.

Reading as Exogenous Measurement

7.1 Placing reading

Reading has often been difficult to place within a strict distinction between exogenous and endogenous activity. The text is already symbolic, which can make reading appear to occur entirely within the symbolic realm. Yet the page or screen is external to the reader and must be physically measured.

Re-registration resolves the ambiguity.

Proposition

Reading is the exogenous re-registration of previously instantiated symbols through the generonic boundary of a reader.

The text is symbolic in provenance and exogenous in relation to the present reader. It must cross again.

7.2 The layered reading event

A fuller reading trajectory is

$$\begin{aligned}
 &\text{external registered mark} \rightarrow \text{sensory interaction} \rightarrow \text{finite distinction} \\
 &\rightarrow \text{generonic crossing} \rightarrow \text{symbolic re-registration} \rightarrow \text{recognition} \\
 &\rightarrow \text{trajectory reconstruction} \rightarrow \text{functional continuation.}
 \end{aligned} \tag{7.1}$$

These layers are not necessarily serial in biological time. They may overlap and recursively constrain one another. The sequence is conceptual: it prevents recognition and meaning from being built into the first physical distinction.

7.3 Familiar words

For a familiar word S , the new registration R_t enters a well-formed basin:

$$R_t \rightarrow \mathcal{B}_S. \tag{7.2}$$

The basin contains more than a dictionary definition. It includes spelling patterns, pronunciations, grammatical positions, prior contexts, bodily associations, emotional histories, and expected continuations. The word feels immediate because this relational structure has been repeatedly stabilised.

Familiarity is therefore compressed history. What appears as effortless access is the result of many earlier measurements and re-registrations.

7.4 Unfamiliar words

An unfamiliar word separates the layers. Suppose a reader encounters a new term. The graphical form may be registered while the lexical and semantic basins remain absent or unstable:

$$R_g \rightarrow R_l \rightarrow \text{candidate trajectories} \rightarrow \text{possible basin formation.} \quad (7.3)$$

We can distinguish several kinds of novelty:

$$N_g : \text{graphical novelty,} \quad (7.4)$$

$$N_p : \text{phonetic novelty,} \quad (7.5)$$

$$N_l : \text{lexical novelty,} \quad (7.6)$$

$$N_s : \text{semantic novelty,} \quad (7.7)$$

$$N_c : \text{contextual novelty.} \quad (7.8)$$

A reader may know the letters but not the word, know the word but not its specialist use, or know several uses while encountering a context that forces a new trajectory.

Learning does not simply attach a definition to a mark. Repeated re-registrations gradually form a basin of admissible relations.

7.5 The role of expectation

Reading is not a sequence of isolated bottom-up measurements. Prior registrations generate an expectation field. The developing sentence constrains what is likely to follow:

$$P(R_{t+1} \mid R_t, R_{t-1}, \dots, H_{\text{reader}}). \quad (7.9)$$

This conditional expression is a symbolic model of expectation, not a claim that the reader computes an exact probability. It indicates that each new registration is measured against a trajectory already in motion.

Expectation can support registration. A partially obscured word may still be recognised. It can also distort registration. A reader may overlook a typographical error or re-register an expected word that is not materially present.

The result is neither pure reception nor arbitrary invention. Reading is constrained reconstruction.

7.6 Reading conditions

The registration depends upon conditions often omitted from theories of meaning:

- illumination, contrast, scale, and typography;
- visual or tactile capacity;
- fatigue, attention, and pace;
- linguistic and technical history;
- surrounding sentences and social context;
- the medium through which the text is presented.

A sentence does not produce one universal reading independent of these conditions. The finite event is

$$R_{\text{reader}} = G_{\text{reader}}(S_{\text{external}} \mid C, H, \alpha, \delta). \quad (7.10)$$

7.7 Reading as measurement, not metaphor

Calling reading a measurement is not merely metaphorical. The reader physically distinguishes finite external patterns. The outcome is constrained by thresholds, noise, duration, prior calibration through learning, and local uncertainty. The fact that the measured patterns are already symbolic does not make the interaction endogenous.

This placement is important for text-within-text. The symbolic realm is not one shared immaterial space. Symbols must be materially re-instantiated whenever they cross between systems. Reading is one of the principal mechanisms by which this renewal occurs.

Registration, Recognition, and Reconstruction

8.1 Three compressed processes

Ordinary language often treats seeing a word, recognising it, and understanding it as one act. The distinction between registration, recognition, and reconstruction allows the process to be unfolded.

$$\text{Registration: } I \rightarrow R, \quad (8.1)$$

$$\text{Recognition: } R \rightarrow \mathcal{B}_S, \quad (8.2)$$

$$\text{Reconstruction: } R_1, \dots, R_n \rightarrow \hat{\mathcal{T}}. \quad (8.3)$$

Registration creates a locally available distinction. Recognition relates the distinction to an existing basin. Reconstruction forms a wider trajectory from multiple registrations and their delays.

8.2 Registration without recognition

A person can register a mark without recognising it. A glyph from an unfamiliar script may be visible, distinguishable, and reproducible. The finite registration exists, but no established lexical or semantic basin is available.

Similarly, a scientist may record an anomalous trace before possessing a model that explains it. The trace is not meaningless in the sense of being absent. It is an available registration awaiting or resisting recognition.

This distinction protects novelty. If registration required prior recognition, genuinely new measurement would be impossible. Every event would already need a model before it could appear.

8.3 Recognition as basin entry

Recognition can be represented as

$$\text{Recog}(R_t; H_A, C_t) \rightarrow \mathcal{B}_S. \quad (8.4)$$

The new registration is related to a historically formed basin. The basin is not a static box. It is a region of admissible continuation shaped by prior encounters.

Recognition therefore has thickness. A word may be recognised weakly, ambiguously, or under competition between several basins:

$$R_t \rightarrow \{\mathcal{B}_{S_1}, \mathcal{B}_{S_2}, \dots\}. \quad (8.5)$$

Context and subsequent registrations can stabilise one trajectory over another.

8.4 Recognition without complete registration

The reverse situation also occurs. A partial or degraded mark may be recognised because the basin is deep and the context is constraining. A missing letter, blurred sound, or damaged inscription may still produce a confident continuation.

We can write:

$$R_{\text{partial}} + C_t + H_A \rightarrow \mathcal{B}_S. \quad (8.6)$$

This is functionally useful. It permits reading under noise and supports rapid communication. It also creates the possibility of hallucinated completion. The symbolic system may stabilise a familiar trajectory beyond what the external registration warrants.

The distinction between registration and recognition therefore provides a clean account of both robustness and error.

8.5 Reconstruction

Recognition of individual words does not yet explain the trajectory of a sentence. A sequence of registrations is related through ordering and delay:

$$R_1, R_2, \dots, R_n \rightarrow \widehat{\mathcal{T}}_n. \quad (8.7)$$

The reconstructed trajectory is continually updated. Each new registration is interpreted in relation to the current state, and the current state changes in response:

$$\widehat{\mathcal{T}}_{t+1} = \text{Recon} \left(\widehat{\mathcal{T}}_t, R_{t+1}, H_A, C_t \right). \quad (8.8)$$

This recursive relation explains why a later clause can alter the apparent meaning of an earlier word. The earlier registration is not physically changed, but its position within the reconstructed trajectory is revised.

8.6 Continuation

Reconstruction is functional because it shapes what can happen next. The reader may continue the sentence internally, answer a question, alter an action, reject the claim, or produce a new external registration.

The full sequence is

$$\boxed{\text{registration} \rightarrow \text{recognition} \rightarrow \text{reconstruction} \rightarrow \text{continuation}}. \quad (8.9)$$

The stages can feed back. A surprising continuation may cause the reader to re-register an earlier word, reread the sentence, or revise the recognised basin.

8.7 Why the distinction matters

Conflating the stages encourages several errors. It makes a measurement appear theory-free because recognition is hidden inside registration. It makes reading appear passive because reconstruction is hidden inside recognition. It makes a model appear to be present in the data because interpretation is compressed into the act of observation.

By separating the stages, we can ask more precise questions:

Diagnostic question

What was physically registered? Which basin recognised it? Which wider trajectory was reconstructed? What continuation did that reconstruction make possible?

These questions will recur in the analysis of symbolic identity, science, translation, and artificial language systems.

Part IV

Symbolic Persistence Without Abstract Types

The Symbolic Lineage

9.1 Persistence without an abstract type

A classical account distinguishes a symbol type from its material tokens. The printed letter, handwritten letter, and displayed letter are separate tokens of one abstract type. The distinction is convenient, but the type itself has no measurable extent, location, duration, or generonic history. It is introduced to explain stability by placing identity outside the finite instances that must carry it.

Registration permits another account. Symbolic continuity is maintained by a historical lineage of finite registrations whose differences remain within an admissible recognition basin.

Let

$$\mathcal{L}_S = (R_1, R_2, \dots, R_n) \quad (9.1)$$

denote the lineage associated with symbol S . No two members need be physically identical:

$$R_i \neq R_j. \quad (9.2)$$

They function as continuations of one symbol when

$$R_i \sim_{\mathcal{A}} R_j. \quad (9.3)$$

Symbolic identity is therefore an achieved relation rather than a pre-existing abstract guarantee.

9.2 Basin membership

A registration may be treated as a member of a symbol's basin:

$$R_i \in \mathcal{B}_S. \quad (9.4)$$

$\mathcal{B}_S$ is not a timeless set with perfectly fixed boundaries. It is a historically formed region of recognition and use. It can deepen through repetition, widen through tolerated variation, narrow through standardisation, fragment through dispute, or merge with neighbouring basins.

This dynamical account fits familiar linguistic history. Letter forms change while remaining legible. Pronunciations drift while words remain recognisable. Technical terms divide into specialised uses. Old inscriptions become difficult to read because the later recognition basin no longer readily captures them.

9.3 A family made by use

The symbolic lineage is not determined by graphical resemblance alone. Two marks may look similar but belong to different functional trajectories. Conversely, visually different marks may belong to one lineage because their use, position, and history support recognition.

A finite symbolic relation may therefore depend on several dimensions:

$$R_i \sim R_j \quad \text{under} \quad (\text{form, use, context, history, admissibility}). \quad (9.5)$$

The symbol is not one of these dimensions in isolation. It is the stabilised relational family produced through their interaction.

Proposition

A symbol persists not because an abstract object remains identical beneath its manifestations, but because finite systems repeatedly produce and recognise sufficiently related registrations.

9.4 Copying and drift

Each copying event introduces the possibility of variation:

$$R_{i+1} = \text{Reg}(R_i \mid A_{i+1}, C_{i+1}, H_{i+1}). \quad (9.6)$$

When the variation remains within the relevant basin, the lineage continues. When accumulated variation exceeds the basin, the symbol may become illegible, be reclassified, or form a new lineage.

This gives a finite account of symbolic drift. There is no need to imagine a pure symbol gradually corrupted by matter. There are only finite registrations and changing rules of relation among them.

9.5 The politics of admissibility

Admissibility is not neutral. Institutions, schools, publishers, scientific communities, and states may enforce particular forms as correct. Standardisation can improve interoperability while suppressing local lineages. A spelling may become official. A dialect may be labelled improper. A scientific notation may displace another.

The basin is therefore partly social. It is maintained through training, correction, repetition, authority, and artefacts. This does not make symbolic identity arbitrary. It makes the conditions of stability historically visible.

9.6 A finite replacement for type and token

The proposed replacement can be summarised:

Classical: abstract type $\rightarrow$ material tokens, (9.7)

Geofinite: registration lineage $\rightarrow$ admissible continuity. (9.8)

The second account retains everything physically available. It can describe strong symbolic stability without asserting an unmeasurable type. It also explains change, because the lineage and basin are dynamical rather than fixed.

This shift will matter later when examining mathematical symbols, archival preservation, machine tokenisation, and the apparent permanence of scientific concepts.

Re-reading and the Changing Reader

10.1 The text appears stable

Re-reading is often described as returning to the same text. At the level of ordinary use this is reasonable. The printed marks may remain materially close enough to their earlier state to be recognised as the same passage. Yet the second reading cannot be the same event.

Let

$$R(S, t_1) \tag{10.1}$$

denote a first reading and

$$R(S, t_2) \tag{10.2}$$

a later reading. Then

$$R(S, t_1) \neq R(S, t_2). \tag{10.3}$$

The registering conditions differ, and the first reading has become part of the reader's history.

10.2 The first reading changes the second

A schematic relation is

$$R_{t_2} = G_{\text{reader}}(S_{\text{external}} \mid H_{t_1} \cup \{R_{t_1}\}, C_{t_2}). \tag{10.4}$$

The reader at t_2 carries the earlier registration. Even when the first reading was confused, that confusion has altered expectation, familiarity, and attention. A second reading may settle more rapidly because a preliminary basin has formed.

This is why repetition can produce clarity without any material change in the text. The system being perturbed has changed.

10.3 The book that changes

Readers commonly report that a book read in youth appears different decades later. The phrase is revealing. The external registration may be stable, yet the reconstructed trajectory has altered because the reader's history has changed.

A passage about grief, work, illness, parenthood, war, or ageing may initially be registered lexically but remain semantically shallow. Later experience deepens or reorganises the basin. The same marks then generate a wider trajectory.

The book has not literally acquired new ink, but neither is it correct to say that nothing has changed. The functional text includes the relation between external registration and reader history. That relation is new.

10.4 Rereading as measurement continuation

Rereading should therefore be understood as a new exogenous measurement under altered conditions. It is not the retrieval of a semantic object stored intact from the first reading.

The sequence is

$$R_{t_1} \rightarrow \Delta H \rightarrow R_{t_2} \rightarrow \Delta H' \rightarrow \dots \quad (10.5)$$

Each event reshapes later possibilities. Re-reading is a trajectory of registrations rather than repetition around a fixed point.

10.5 Commentary and changed basins

A commentary, lecture, or conversation can alter the next reading of a primary text. The commentary does not insert meaning into the original page. It changes the recognition basins and expectation field with which the page is re-registered.

This is important for scholarship. Interpretation is not merely applied after reading. Prior interpretations can become part of the generonic conditions of reading itself. A famous commentary may become so deep a basin that readers cease to notice alternative trajectories present in the marks.

The framework therefore asks scholars to distinguish:

- the surviving external registration;
- the history of its re-registrations;
- the commentary basins guiding present recognition;
- the current reconstructed trajectory.

10.6 The impossibility of a final reading

Because the registering system changes, no reading is final in an absolute sense. A community may stabilise a highly admissible interpretation, and a reader may reach a practical halting condition. Neither stability removes the possibility of later re-registration under changed conditions.

This is not an invitation to unlimited interpretation. External marks, provenance, grammar, genre, and historical use constrain admissibility. It is a recognition that the relation remains dynamical.

Proposition

A stable external text can support changing readings because re-registration depends upon the current history of the registering system.

Memory, Recall, and Endogenous Reconstruction

11.1 Not every recurrence is re-registration

Re-registration requires a new exogenous encounter with a previously instantiated symbol. Memory complicates the picture because a word or scene can recur without the original external mark being present.

A recalled symbol is better described as an endogenous reconstruction:

$$H_A \rightarrow S_{\text{recalled}}. \quad (11.1)$$

The earlier registration participates through the changed structure of the system, but it is not retrieved as an untouched object.

11.2 Memory is not a store of identical tokens

The storage metaphor suggests that a registration is placed somewhere and later removed in the same form. A finite dynamical account treats the earlier event as having altered the system. Recall is a new trajectory through that altered structure.

Let R_{t_0} be an earlier registration. A later recall may be written

$$S_{t_1} = \text{Recon}_{\text{endo}}(H_A \mid C_{t_1}, \delta_{t_1}). \quad (11.2)$$

The recalled symbol depends on present context and uncertainty. It may be close to the earlier registration, compressed, expanded, or reorganised.

This explains why memory can be stable enough for identity and yet change over time. There is no requirement that an exact token be preserved.

11.3 Reading, recall, and expression

The three operations can be distinguished:

Reading : exogenous re-registration, (11.3)

Recall : endogenous reconstruction, (11.4)

Expression : new external registration. (11.5)

A person reads a sentence, later recalls it, and then speaks or writes it. The lineage is

$$R_{\text{read}} \rightarrow S_{\text{recalled}} \rightarrow R_{\text{external,new}}. \quad (11.6)$$

Each stage is finite and transformative. A quotation from memory is not the original sentence transported through time. It is a new registration produced from an endogenous reconstruction.

11.4 Recognition can be retrospective

Sometimes recall feels like recognition. A fragment emerges and is then identified as belonging to a known source. The system first reconstructs a candidate trajectory and then relates it to a basin of provenance.

This suggests that recognition can operate upon endogenous symbols as well as exogenous registrations:

$$\text{Recog}(S_{\text{recalled}}) \rightarrow \mathcal{B}_{\text{source}}. \quad (11.7)$$

The source attribution may be correct or mistaken. Again, recognition is not guaranteed by the existence of the symbol.

11.5 Memory and symbolic continuity

Individual memory is one mechanism by which symbolic lineages persist. Before widespread writing, oral traditions depended upon repeated cycles of recall and external registration:

$$R_A \rightarrow S_{A,\text{recall}} \rightarrow R_B \rightarrow S_{B,\text{recall}} \rightarrow \cdots \quad (11.8)$$

Rhythm, rhyme, ritual, and repetition can be understood as methods for deepening basins and reducing drift across these cycles. They are technologies of re-registration.

11.6 The finite honesty of remembering

The framework replaces the demand for exact recovery with a more measurable question: how closely does the present reconstruction relate to earlier registrations under the available provenance and uncertainty?

$$S_{\text{recalled}} \sim_{\delta,H} R_{\text{past}}. \quad (11.9)$$

This relation is neither a declaration of unreliability nor a defence of memory. It simply places remembering inside the same finite symbolic mechanics as every other

reconstruction.

Part V

Writing, Speech, and Communication

Writing as External Registration

12.1 The outward movement

Reading brings an external registration into a new local symbolic trajectory. Writing moves in the other direction. An endogenous trajectory is compressed and stabilised as an external mark:

$$\mathcal{T}_{\text{writer}} \rightarrow R_{\text{external}}. \quad (12.1)$$

Proposition

Writing is the external registration of a compressed endogenous symbolic trajectory.

The external text is not the writer's complete thought. It is a finite sequence produced from a much thicker and more rapidly changing internal landscape.

12.2 Projection into a line

The writer may hold several possible continuations, images, memories, objections, and tones at once. Writing requires serialisation:

$$\mathcal{M}_{\text{writer}} \rightarrow (S_1, S_2, \dots, S_n). \quad (12.2)$$

A high-dimensional trajectory is projected into a one-dimensional order of finite marks. This is not merely a limitation. The order creates new structure. Relations that were simultaneous or diffuse must be placed into a sequence, and that sequence can be reread, compared, and revised.

Writing therefore both compresses and constructs. The external sentence is not simply a reduced version of prior thought. It becomes a new object that can perturb the writer in return.

12.3 The writer becomes a reader

As soon as the mark is externalised, the writer may re-register it. Writing is often an alternating loop:

$$\mathcal{T}_A \rightarrow R_{A,1} \rightarrow \text{re-registration by } A \rightarrow R_{A,2} \rightarrow \dots \quad (12.3)$$

The page feeds back into the writer's trajectory. A phrase may reveal an inconsistency that was not apparent before externalisation. The text becomes an instrument through which the writer measures their own prior symbolic activity.

This is one reason why writing can produce discovery. The external registration slows and spatially arranges a trajectory that was previously difficult to inspect.

12.4 What is omitted

Externalisation removes or leaves implicit much of the originating trajectory:

- alternative formulations;
- discarded branches;
- bodily and emotional conditions;
- private associations;
- gestures, pacing, and tone;
- uncertainty that the grammar later hides;
- assumptions shared with an imagined reader.

The written mark carries registration drag. A careful writer may restore some of the omitted trajectory through examples, qualifications, notes, and narrative. A compressed technical style may remove nearly all of it.

12.5 A text is a new generonic object

Once written, the text can act as an exogenous input to other systems. It may be printed, copied, indexed, scanned, quoted, translated, or used as training data. The writer's trajectory has been converted into a structured opportunity for future re-registration.

The lineage becomes

$$\mathcal{T}_A \rightarrow R_{\text{text}} \rightarrow R_B \rightarrow \widehat{\mathcal{T}}_B. \quad (12.4)$$

The middle registration is crucial. Without it, the relation between minds appears direct. With it, communication becomes materially grounded.

12.6 Authorship and finite responsibility

Because the external registration cannot contain every condition of its production, authorship includes responsibility for compression. The writer chooses what to retain, what to omit, which uncertainty to expose, and which basin to encourage.

This responsibility is particularly strong in scientific writing. A sentence can make a derived model sound like a direct measurement simply by removing the registration lineage. Writing is therefore not a neutral wrapper around knowledge. It actively determines which parts of the measurement trajectory remain available to later readers.

Speech and Listening

13.1 The acoustic registration

Speech externalises an endogenous symbolic trajectory through a temporally structured physical interaction. Vocal movement perturbs the surrounding medium. A listener's auditory system measures that perturbation and produces new registrations.

A compressed speech trajectory is

$$\mathcal{T}_A \rightarrow R_{\text{acoustic}} \rightarrow R_B \rightarrow \mathcal{T}_B. \quad (13.1)$$

The acoustic event is not meaning. It is a finite structured perturbation capable of producing related symbolic registrations in a suitably prepared listener.

13.2 Temporal dependence

Unlike a printed line, speech disappears as it occurs unless further registered. Listening therefore depends strongly on temporal integration and memory. A word cannot be recognised from one sound point. Its form arises across a finite interval:

$$R_{\text{word}} = \text{Recon}(R_{t-k}, \dots, R_t). \quad (13.2)$$

Prosody, timing, emphasis, and silence form part of the registration conditions. A transcript compresses these dimensions and may alter the reconstructed trajectory.

13.3 Noise and prediction

Auditory registration commonly occurs under noise. Listeners reconstruct missing or ambiguous portions using context and expectation. This makes speech robust, but it also makes mishearing inevitable.

$$R_{\text{partial}} + H_B + C_t \rightarrow \mathcal{B}_{S_j}. \quad (13.3)$$

Different listeners may settle into different basins. Later words can cause retrospective revision, showing again that recognition is embedded in a changing trajectory.

13.4 Conversation as coupled dynamics

Conversation is not a sequence of completed messages passed between fixed agents. Each utterance changes the field in which the next is produced.

$$A_1 \rightarrow B_1 \rightarrow A_2 \rightarrow B_2 \rightarrow \dots \quad (13.4)$$

Here A_2 is not generated by the same state that produced A_1 . The speaker has re-registered the listener's response. The two systems are coupled through alternating external registrations.

The conversation creates a temporary shared attractor, but the sharedness is relational rather than identical. Each participant reconstructs the trajectory locally.

13.5 Gesture and multimodal registration

Speech rarely travels alone. Facial movement, posture, gaze, and surrounding objects may constrain recognition. The full interaction is multimodal:

$$R_B = G_B(R_{\text{acoustic}}, R_{\text{visual}}, R_{\text{contextual}} \mid H_B). \quad (13.5)$$

A written transcript that retains only lexical content is therefore a strong compression. It can be valuable, but it should not be mistaken for the entire registration event.

13.6 The physical lineage of dialogue

No meaning substance crosses between minds. What crosses are structured physical interactions. These interactions are registered, recognised, reconstructed, and answered through new registrations.

This formulation preserves both the materiality and the richness of conversation. It does not reduce speech to acoustics, because the acoustic registration becomes meaningful only within symbolic history. It does not detach meaning from acoustics, because every conversational continuation depends upon finite externalisation and renewed measurement.

Why Meaning Is Not Transferred

14.1 The container metaphor

Many accounts of communication rely on a container metaphor. A speaker has a meaning, encodes it in a message, and sends it to a receiver who decodes the same meaning. The model is powerful for engineered channels where the aim is to preserve an agreed symbol sequence. It becomes misleading when applied without qualification to semantic trajectories.

The compressed picture is

$$M_A \rightarrow \text{message} \rightarrow M_B. \quad (14.1)$$

The registration picture is

$$\mathcal{T}_A \rightarrow R_{\text{external}} \rightarrow R_B \rightarrow \mathcal{T}_B. \quad (14.2)$$

No term in the second expression requires a semantic object to travel unchanged.

14.2 Constraint without transfer

The external registration constrains the reader or listener. It is not an empty prompt. Word order, grammar, marks, medium, provenance, and context all reduce the admissible continuation space. Yet constraint is not transfer.

A useful relation is

$$\mathcal{T}_A \sim_{C,H,A} \mathcal{T}_B. \quad (14.3)$$

The trajectories may overlap strongly enough for coordinated action. They may also diverge in ways that remain invisible until a later response.

14.3 Why misunderstanding is normal

If meaning were transferred as an object, misunderstanding would appear as a failure or corruption of an otherwise exact process. Under re-registration, divergence is expected. The two systems possess different histories, basins, uncertainties, and present conditions.

Misunderstanding can arise through:

- different recognition basins;
- missing provenance;
- ambiguous compression;
- incompatible technical vocabularies;
- different scales of attention;
- conflicting expectations;
- noise or partial registration.

Successful communication is therefore a stabilisation achievement, not the default transport of identity.

14.4 Not unrestricted interpretation

Rejecting transfer does not imply that any interpretation is equally admissible. The external registration remains a constraint. A reconstruction that ignores the marks, grammar, history, and context may fall outside the relevant basin.

Admissibility can be represented as

$$\mathcal{T}_B \in \Omega(R_{\text{external}}, H, C, \mathcal{A}), \quad (14.4)$$

where Ω is the constrained region of plausible continuations. The region may be narrow or wide, but it is not unlimited.

Proposition

Communication creates constrained opportunities for related symbolic reconstruction. It does not transfer a completed meaning object.

14.5 Repair as iterative measurement

Conversation includes mechanisms for detecting and repairing divergence. A listener asks a question, the speaker reformulates, examples are added, and the trajectories are compared through further registrations.

$$R_1 \rightarrow \widehat{\mathcal{T}}_1 \rightarrow R_2 \rightarrow \widehat{\mathcal{T}}_2 \rightarrow \dots \quad (14.5)$$

Communication improves through iterative measurement continuation. The parties do not inspect each other's meaning directly. They perturb and re-register until the resulting continuations are sufficiently aligned for the purpose at hand.

14.6 The practical value of the distinction

The language of transfer encourages overconfidence. A writer assumes that a definition has placed the intended meaning into the text. A scientist assumes that presenting a formula has transmitted the model. A teacher assumes that exposure has produced understanding.

The language of registration creates a more practical question: what sequence of external registrations is likely to allow the reader to reconstruct the required trajectory?

Examples, repetition, contrast, provenance, and varied contexts become central rather than supplementary.

The Reader Is the Author

15.1 A careful claim

The statement “the reader is the author” can sound like a rejection of textual constraint. That is not its purpose. The claim concerns the locus of the realised symbolic trajectory.

The external author produces the text. The reader produces the local reconstruction.

$$\mathcal{T}_{\text{reader}} = F(R_1, R_2, \dots, R_n; H_{\text{reader}}, C, \delta). \quad (15.1)$$

The sequence of marks constrains the result, but the resulting trajectory exists only through the reader’s registrations and historical landscape.

15.2 Two forms of authorship

We can distinguish:

$$A_e : \text{external authorship of the registered text}, \quad (15.2)$$

$$A_l : \text{local authorship of the reconstructed trajectory}. \quad (15.3)$$

The external author chooses and arranges marks. The local author forms the experienced symbolic continuation. Neither authorship is complete in isolation.

This distinction helps avoid two extremes. Textual absolutism treats the author’s meaning as fully contained in the marks. Radical subjectivism treats the marks as irrelevant to the reader’s response. Re-registration shows a coupled relation.

15.3 The role of prior history

The reader supplies the basins into which the marks can settle. A technical monograph assumes a vocabulary, mathematical practice, and historical set of distinctions. A novice reader may register the marks without reconstructing the intended trajectory. An expert may see implications not explicitly written.

The reader’s contribution is therefore not optional decoration. It is a condition of symbolic realisation.

15.4 The text resists

Although the reader authors the local trajectory, the text can resist a preferred interpretation. Unexpected words, contradictory clauses, definitions, and examples force revisions. The external registration acts as a continuing measurement constraint.

A disciplined reader repeatedly compares reconstruction with the marks:

$$\widehat{\mathcal{T}}_t \leftrightarrow (R_1, \dots, R_t). \quad (15.4)$$

This movement is why close reading can differ from free association. The reader allows the external sequence to alter the developing basin rather than using it merely as a trigger for an already fixed trajectory.

15.5 Authorship as responsibility

Local authorship carries responsibility. The reader should distinguish what is materially present, what has been inferred, what has been imported from prior theory, and what remains uncertain.

This is especially important in scientific and philosophical reading. A familiar model can cause the reader to re-register an ambiguous statement as confirmation of that model. The reconstructed trajectory then appears to have come from the text.

Diagnostic question

Which part of this interpretation is constrained by the external registration, and which part has been supplied by the reader's existing basin?

15.6 Co-authorship across time

Texts accumulate readers, commentaries, translations, and institutional uses. The realised cultural trajectory is therefore multiply authored. The original external author begins a lineage, but later re-registrations reshape its functional significance.

The phrase “the reader is the author” can thus be expanded:

Every reading locally authors a constrained continuation of a historically registered text.

This formulation preserves the material text, the original act of writing, the reader's dynamical contribution, and the possibility of changing admissibility across time.

Part VI

Functional Symbolic Trajectories

From Registration to Functional Symbolic Trajectory

16.1 The symbol in motion

A registration rarely functions alone. Its significance depends upon what came before, what follows, which system registered it, and what action it makes possible. The central unit of Finite Symbolic Mechanics is therefore not the isolated symbol but the **Functional Symbolic Trajectory**.

A trajectory may be represented as

$$\mathcal{T} = (R_1, R_2, \dots, R_n; C, \delta, H, \mathcal{A}). \quad (16.1)$$

The sequence carries ordering, context, uncertainty, provenance, and rules of admissible continuation.

16.2 Local registration and relational function

Registration gives a symbol physical and historical entry. Trajectory gives it relational function.

The word *bank* can be registered as a familiar lexical form, but its functional continuation differs across trajectories involving money, rivers, aircraft, or stored data. The registration alone underdetermines the basin. The surrounding sequence resolves or maintains the thickness.

$$R_{\text{bank}} + C_1 \rightarrow \mathcal{B}_{\text{finance}}, \quad R_{\text{bank}} + C_2 \rightarrow \mathcal{B}_{\text{river}}. \quad (16.2)$$

16.3 Trajectory is not a path through an abstract space

Phase-space language is useful, but it must remain grounded. A Functional Symbolic Trajectory is not assumed to move through a pre-existing perfect manifold. The manifold is reconstructed from finite relations among registrations. Its geometry is a model of measured symbolic continuation.

This point mirrors the wider Geofinite commitment. The trajectory is not a hidden object discovered beneath language. It is a finite relational structure built from registrations

and their measurable dependencies.

16.4 Trajectory thickness

A trajectory has thickness because each registration is uncertain and may couple to overlapping basins. We may write

$$\mathcal{T}_t \in \Omega_t, \quad (16.3)$$

where Ω_t is the local region of admissible continuations. As more registrations arrive, the region may narrow, widen, or bifurcate.

This is a more realistic account than treating a sentence as a chain of exact meanings. The trajectory is stabilised progressively.

16.5 Functional halting

A trajectory need not end when the final printed mark is reached. It may continue into action, memory, argument, or later rereading. A practical halting condition occurs when the registering system treats the trajectory as sufficiently complete for its present purpose.

Let

$$\text{Halt}(\mathcal{T}_t \mid P_A) = 1 \quad (16.4)$$

when system A judges the trajectory adequate for purpose P_A . The condition is local and functional, not an absolute endpoint in meaning.

16.6 Registration lineage and trajectory

A symbolic lineage and a Functional Symbolic Trajectory are related but distinct. The lineage tracks repeated instantiations of a symbol across occasions. The trajectory tracks functional relations among symbols within an unfolding event.

$$\mathcal{L}_S = (R_S^{(1)}, R_S^{(2)}, \dots), \quad (16.5)$$

$$\mathcal{T} = (R_{S_1}, R_{S_2}, \dots, R_{S_n}). \quad (16.6)$$

Language depends on both. Lineage supplies historical stability; trajectory supplies local meaning.

Proposition

A finite symbol becomes linguistically functional only within a trajectory, while the trajectory remains possible only because symbolic lineages have stabilised recognisable registrations.

Semantic Thickness and Overlapping Basins

17.1 The thickness of a word

A word is finite in each registration but historically thick in its possible relations. This is not a contradiction. The visible mark has bounded extent, while the lineage of uses and continuations extends across many registrations.

Let a symbol S be associated with overlapping basins

$$\mathcal{B}_S^{(1)}, \mathcal{B}_S^{(2)}, \dots, \mathcal{B}_S^{(k)}. \quad (17.1)$$

A new registration couples to these basins under the present context:

$$R_S + C_t + H_A \rightarrow \{\mathcal{B}_S^{(j)}\}. \quad (17.2)$$

The result may be stable, ambiguous, or deliberately multiple.

17.2 Uncertainty is constitutive

Semantic uncertainty is not merely a temporary failure to identify a hidden exact meaning. It arises because the symbol participates in several finite trajectories. Even a tightly defined technical term acquires uncertainty when moved between disciplines, instruments, or historical periods.

We can represent a local semantic thickness as

$$\delta_S(t) = \text{spread}(\Omega_S(t)), \quad (17.3)$$

where $\Omega_S(t)$ is the region of admissible continuations at time t . The expression is schematic. Its purpose is to treat uncertainty as relational geometry rather than a defect attached from outside.

17.3 Context does not eliminate history

Context may narrow a basin, but it rarely removes all historical thickness. A legal term can be locally defined while still carrying wider connotations. A mathematical symbol can

be assigned a role within one proof while retaining other uses that influence a reader.

The idea that context fixes meaning completely is another compression. Context is itself a finite trajectory requiring registration and interpretation.

17.4 Metaphor as basin coupling

Metaphor can be described as a controlled coupling between basins that are ordinarily separated:

$$\mathcal{B}_A \leftrightarrow \mathcal{B}_B. \quad (17.4)$$

The new trajectory is not merely decorative. It can create distinctions that were previously unavailable. Scientific language repeatedly uses this mechanism: field, force, wave, particle, information, code, and landscape all carry earlier trajectories into new domains.

The danger arises when the metaphor's originating geometry is forgotten and treated as a literal structure of the world.

17.5 Contested definitions

A dispute over a word is often a struggle to stabilise its basin. Different communities attempt to make particular trajectories admissible or inadmissible. Definitions are not observations from outside language. They are endogenous interventions within the symbolic landscape.

This does not make definition futile. It makes the process measurable through examples, histories, institutional rules, and consequences.

17.6 Semantic metrics

A future formal development may attempt to measure distances among registrations or trajectories. Any metric must remain finite and purpose-bound. It cannot assume an abstract semantic space independent of the registrations used to construct it.

A provisional distance may be written

$$d_{\text{sem}}(\mathcal{T}_i, \mathcal{T}_j \mid C, H, \mathcal{A}), \quad (17.5)$$

with all conditioning terms explicit. The metric would measure relations within a selected symbolic practice, not universal meaning.

17.7 Thickness as strength

Semantic thickness is often treated as a problem to be eliminated. Yet it is also what permits language to adapt, metaphor to work, and new trajectories to form. A perfectly rigid symbol would have little capacity to enter unfamiliar contexts.

The Geofinite task is not to remove thickness but to measure and narrate it honestly.

Registration and Takens Reconstruction

18.1 The measured sequence

A reader receives a serial sequence of registrations:

$$R_1, R_2, \dots, R_n. \quad (18.1)$$

The full symbolic state that produced the text is not directly available. Yet relations among successive measurements can support reconstruction of a higher-dimensional functional trajectory. This is the point of contact with Takens-style delay embedding.

A delay vector may be written

$$\mathbf{x}_t = (R_t, R_{t-\tau}, R_{t-2\tau}, \dots, R_{t-(m-1)\tau}). \quad (18.2)$$

The notation does not claim that human reading implements one exact classical algorithm. It provides a disciplined model of how current registration acquires function through its relation to delayed registrations.

18.2 Meaning in the curvature

An isolated token has limited functional content. Its role emerges from the relational curvature formed by neighbouring and delayed registrations. The reconstructed state may be written

$$\widehat{\mathcal{M}}_t = \text{Recon}(\mathbf{x}_t \mid H_A, C_t). \quad (18.3)$$

The semantic manifold is not assumed to exist independently. It is reconstructed from the finite observed sequence and the history of the registering system.

18.3 Expectation as local geometry

The reconstructed trajectory constrains the next likely registration:

$$P(R_{t+1} \mid \mathbf{x}_t, H_A). \quad (18.4)$$

This conditional relation can be understood as an expectation field. A strong basin gives a narrow range of continuations; an ambiguous passage gives a wider range. Surprise occurs

when a new registration lies outside the locally dominant basin and forces reconstruction.

18.4 Attention as pairwise embedding

In a transformer, query and key relations construct a pairwise geometry among token registrations. From the present perspective, attention can be interpreted as a learned delay-coordinate mechanism that reconstructs which prior registrations are functionally active for the current continuation.

The model does not contain abstract meanings. It transforms finite token registrations into a relational state and produces a further symbolic projection.

This supports the Takens-Based Transformer programme, where delay structure is made explicit rather than hidden within standard attention.

18.5 Basins and training

Training data provide repeated symbolic trajectories. Repetition deepens specific basins:

$$\{\mathcal{T}^{(1)}, \mathcal{T}^{(2)}, \dots\} \rightarrow \mathcal{B}_{\text{model}}. \quad (18.5)$$

A small model requires carefully constructed run-ins because the basin is not supported by the enormous overlap available to a large corpus. The trajectory into a question matters. Three repeated copies of a specific path can deepen a narrow groove, while varied on-ramps are required for broader inference.

Registration makes this training account more precise. Each token is a machine-level re-registration of an external textual symbol. Tokenisation, embedding, delay reconstruction, and output decoding are successive symbolic transformations.

18.6 The logit decoder as registration generator

A model's logit state is not yet an external word. Decoding selects and instantiates a finite token. Rendering that token creates an external registration that a human can re-register.

The chain is

$$\text{internal model state} \rightarrow \text{decoded token} \rightarrow R_{\text{display}} \rightarrow R_{\text{reader}}. \quad (18.6)$$

The word *registration* itself entered the present framework through such a chain. Its usefulness did not come from an abstract store of definitions. It emerged because the decoded word coupled cleanly to an already developing Geofinite trajectory.

18.7 A shared temporary attractor

Dialogue between a person and a language model can be described as alternating registration and reconstruction. Each response perturbs the next state of the other system. A shared temporary attractor forms across the conversation, but it remains distributed across physically separate registrations.

This is not mystical co-consciousness. It is a measurable coupled symbolic process:

$$R_{A,1} \rightarrow R_{B,1} \rightarrow R_{A,2} \rightarrow R_{B,2} \rightarrow \cdots \quad (18.7)$$

The Takens perspective gives the dynamical form; registration gives the finite physical lineage.

Part VII

Scientific Registration

Instruments, Data, and the First Registration

19.1 The instrument participates

Scientific language often says that an instrument measures a property. The phrase can suggest that a symbolic value existed in the world and was transferred into the apparatus. Registration begins elsewhere. It begins with an interaction in which the instrument participates and from which a finite mark is produced.

$$I_{\text{physical}} \rightarrow A_{\text{instrument}} \rightarrow R_e. \quad (19.1)$$

The exogenous registration R_e is the first locally available symbol in the scientific trajectory. It is not the whole interaction and not necessarily a copy of a pre-existing quantity.

19.2 The apparatus is a generonic geometry

An instrument has materials, orientation, thresholds, integration times, filters, and calibration history. These determine which distinctions can become registrations.

A mass spectrometer, telescope, thermometer, camera, gravitational detector, or particle counter each creates a different interactional geometry. The apparent object of measurement is inseparable from the means by which a distinction is made.

The registration can be written

$$R_e = G_A(I \mid C, \tau, \alpha, \delta, H, \mathcal{A}). \quad (19.2)$$

Scientific reproducibility depends upon controlling or narrating these conditions. It does not demonstrate that the registration is apparatus-free.

19.3 Analogue response and symbolic threshold

Many instruments contain a pre-symbolic or continuously varying response before a discrete value is recorded. A threshold, sampling operation, or comparison produces a finite mark. This is a clear generonic crossing.

For example:

$$I \rightarrow x(t) \rightarrow Q_{\alpha,\tau}[x(t)] \rightarrow R_e, \quad (19.3)$$

where $x(t)$ is an interactional response and $Q_{\alpha,\tau}$ is a finite registration operation conditioned by resolution α and interval τ .

The notation should not be read as privileging a mathematical continuum. It simply separates the responsive region from the eventual finite symbol.

19.4 Data are already registrations

A dataset is commonly described as raw. Yet every data point has already passed through apparatus, thresholds, timing, selection, encoding, and storage. There is no symbolically available raw world beneath the registrations.

Proposition

Data are not unmediated pieces of the world. They are structured collections of registrations with compressed generonic histories.

This does not make data arbitrary. The originating interaction constrains the registrations. It does mean that data quality cannot be assessed independently of apparatus and provenance.

19.5 Nested registrations

Modern instruments frequently produce a chain:

$$I \rightarrow R_{\text{sensor}} \rightarrow R_{\text{electronic}} \rightarrow R_{\text{digital}} \rightarrow R_{\text{file}} \rightarrow R_{\text{display}}. \quad (19.4)$$

Each stage may alter scale, precision, format, or uncertainty. The final plotted point is not the first registration. It is a late-stage symbolic product with a lineage.

A rigorous report should indicate where calibration, filtering, averaging, interpolation, and exclusion occur. These operations are not outside the measurement. They shape the available result.

19.6 The observer's re-registration

The scientist usually encounters the instrument output through another re-registration: reading a display, graph, or table. The complete lineage includes both machine and human generonic boundaries:

$$I \rightarrow R_{\text{instrument}} \rightarrow R_{\text{display}} \rightarrow R_{\text{scientist}}. \quad (19.5)$$

The phrase “the instrument showed” compresses this chain. In some circumstances that compression is harmless. In foundational disputes it can hide where interpretation entered.

19.7 Measurement as interactional stabilisation

A scientific measurement is best treated as an interactional stabilisation that produces an admissible registration. Its quality depends upon how well the lineage is known, how the uncertainty is carried, and how effectively alternative generonic explanations are excluded.

The instrument is not a passive window. It is a constructed Generon.

Derived Symbols Are Not New Measurements

20.1 The decisive distinction

Once registrations enter the symbolic realm, they can be combined, transformed, averaged, normalised, fitted, and projected. These operations are powerful. They do not by themselves create new exogenous measurements.

Let $R_{e1}, \dots, R_{en}$ be registrations. An endogenous derivation is

$$S_d = F(R_{e1}, R_{e2}, \dots, R_{en}). \quad (20.1)$$

S_d is a real finite symbol within the symbolic realm. It may be precise, reproducible, and mathematically necessary. Its lineage nevertheless differs from an exogenous registration.

20.2 A taxonomy of scientific symbols

It is useful to distinguish:

$$R_e : \text{exogenous registration}, \quad (20.2)$$

$$S_d : \text{endogenous derived symbol}, \quad (20.3)$$

$$I_m : \text{model interpretation}, \quad (20.4)$$

$$O_c : \text{claim concerning the world beyond registration}. \quad (20.5)$$

A typical trajectory is

$$R_e \rightarrow S_d \rightarrow I_m \rightarrow O_c. \quad (20.6)$$

Each arrow introduces a new operation and new commitments. Scientific prose often compresses all four into the phrase “we measured”.

20.3 The Planck length as an example

The Planck length is formed from previously established constants within a dimensional and theoretical relation:

$$\ell_P = \sqrt{\frac{\hbar G}{c^3}}. \quad (20.7)$$

It is a derived symbolic quantity. No instrument has directly registered a ruler, interval, pixel, or quantum of information of length ℓ_P . The equation can be internally valid and theoretically suggestive without being an exogenous registration of the world's smallest scale.

A disciplined lineage is

$$\{R_G, R_h, R_c\} \rightarrow S_{\ell_P} \rightarrow I_{\text{minimum scale}} \rightarrow O_{\text{spacetime}}. \quad (20.8)$$

The later interpretations may be valuable conjectures. They should not be silently moved back to the first position.

20.4 Precision can conceal distance from measurement

Endogenous derivations can have many digits and exact algebraic form. This apparent precision can exceed the lineage of the registrations from which they were formed. The more elegant the result, the easier it is to forget the finite uncertainty and model conditions underneath it.

A derived quantity should therefore retain uncertainty and provenance:

$$S_d = F(R_1 \pm \delta_1, \dots, R_n \pm \delta_n \mid H, M). \quad (20.9)$$

The model M belongs inside the conditioning, not outside the result.

20.5 Prediction is not registration

A model may predict a future registration:

$$\hat{R}_{n+1} = P(M, R_1, \dots, R_n). \quad (20.10)$$

The prediction remains symbolic expectation until a new exogenous interaction produces

$$R_{n+1}. \quad (20.11)$$

The comparison is

$$\hat{R}_{n+1} \sim_{\delta, \mathcal{A}} R_{n+1}. \quad (20.12)$$

Successful comparison supports the model under the tested conditions. It does not convert every internal entity of the model into a measured object.

Diagnostic question

Is this quantity an exogenous registration, an endogenous derivation, a model interpretation, or a claim projected beyond measurement?

20.6 Why the distinction improves science

Separating the stages is not an attack on theory. It protects the strength of theory by stating what has actually been achieved. A derived symbol can unify many registrations, reveal regularity, and guide new experiments. Its value does not depend on pretending that it was directly found in the world.

The distinction also clarifies model failure. When prediction and registration diverge, one can inspect the registering apparatus, the derivation, the interpretation, and the world claim separately rather than treating the entire structure as one indivisible theory.

Registration, Model, and World

21.1 The recurrent crossing

A model is a symbolic construction organised from registrations, inherited rules, mathematical operations, and interpretive commitments. It can be extraordinarily stable and useful. The foundational error occurs when the model's entities are treated as though they had crossed the generonic boundary in the same manner as the measurements that constrain them.

The scientific lineage is

$$R_1, R_2, \dots, R_n \rightarrow M \rightarrow \hat{R}_{n+1}. \quad (21.1)$$

The model remains within text-within-text. Its contact with the world is renewed only through later registration.

21.2 Model invariance and world invariance

A quantity can be invariant under transformations admitted by a model. This is a formal property of the symbolic system. It does not automatically establish that the quantity exists independently of all measurement and representation.

The compressed inference is

$$\text{model invariant} \Rightarrow \text{invariant feature of reality}. \quad (21.2)$$

The finite account inserts the missing stages:

$$\text{registered relations} \rightarrow \text{model} \rightarrow \text{formal invariance} \rightarrow \text{interpretive claim}. \quad (21.3)$$

The final step may be justified pragmatically, but it is not the same operation as measurement.

21.3 The model as a stabilising instrument

Models are instruments for continuation. They compress prior registrations and generate expectations. A good model allows a community to coordinate future measurement,

engineering, and explanation.

We can define a local functional adequacy:

$$\text{Adeq}(M \mid \mathcal{A}, C) = \text{fit}(\hat{R}, R). \quad (21.4)$$

This adequacy is measured under conditions. It does not require metaphysical identity between model and world.

21.4 When models become nouns

The grammar of science often turns relational models into stable nouns: field, particle, spacetime, information, force, entropy. The noun form hides the operations and registrations from which the concept was built.

This is another slow-verb problem. A field can be treated as the stabilised name for a family of measured relations and modelled continuations. When the history disappears, the field appears to be a self-existing substance encountered directly.

Registration provides a route for unfolding the noun:

$$\text{scientific noun} \rightarrow \text{model relations} \rightarrow \text{derived symbols} \rightarrow \text{registrations}. \quad (21.5)$$

21.5 The world beyond symbolic measurement

Geofinitism does not deny a world beyond measurement. It denies that finite symbols can step outside themselves and certify their identity with that world. The world participates in interactions that constrain registration. The form of the registration cannot be assumed to be the form of the world.

Proposition

A model may be the best available organisation of registrations in an epoch without becoming a transparent disclosure of the world beyond registration.

This position permits realism about interaction and caution about symbolic form. It avoids both idealism and naive model realism.

21.6 New measurements change the symbolic world

A new instrument can create registrations that were previously unavailable. These registrations may require new language, alter old basins, and reorganise models. Scientific epochs are therefore partly generonic epochs: they are defined by what can be registered.

The symbolic realm does not grow merely through more deduction. It grows when artefacts create new exogenous crossings.

Scientific Reading as Re-registration

22.1 The paper is not the experiment

A scientific reader usually encounters a paper, report, plot, or presentation. These are late registrations in a long lineage. The reader does not directly encounter the originating physical interaction.

A fuller scientific trajectory is

$$\begin{aligned}
 &\text{physical interaction} \rightarrow \text{instrument registration} \rightarrow \text{data processing} \\
 &\quad \rightarrow \text{derived symbols} \rightarrow \text{model interpretation} \\
 &\quad \rightarrow \text{written registration} \rightarrow \text{reader re-registration} \\
 &\quad \rightarrow \text{reader reconstruction.}
 \end{aligned} \tag{22.1}$$

The phrase “the experiment shows” compresses this entire chain.

22.2 Figures as generonic compressions

A graph may compress thousands of registrations into a line. Axes, smoothing, binning, colour, scale, and selection shape what the reader can re-register. The graph is not a transparent view of the data, and the data are not a transparent view of the interaction.

A figure can be highly informative while remaining doubly generonic:

$$\{R_i\} \rightarrow R_{\text{figure}} \rightarrow R_{\text{reader}}. \tag{22.2}$$

The reader’s interpretation depends on graph literacy, domain models, and expectations.

22.3 The authority of compressed prose

Scientific prose commonly removes agents and apparatus: “a signal was detected”, “the particle travelled”, “space expanded”, “information was lost”. Passive grammar gives the claim an appearance of direct world speech.

A registration-aware style restores stages where they matter:

- the instrument registered;
- the analysis derived;

- the model represented;
- the authors interpreted;
- the reader reconstructed.

This need not make every sentence cumbersome. It provides a vocabulary for moments where model and measurement risk conflation.

22.4 Reading a result critically

A registration-based reading asks:

1. What was the first exogenous registration?
2. Which transformations produced the published quantity?
3. Which model entities were introduced after registration?
4. Which uncertainty and provenance were compressed?
5. What claim about the world is being made?

These questions do not begin by rejecting the result. They reconstruct its lineage.

22.5 Reproducibility as lineage reconstruction

Replication attempts to recreate an interactional and generonic trajectory sufficiently similar to the original:

$$R'_e \sim_{\mathcal{A}} R_e. \quad (22.3)$$

Failure to reproduce can arise from the world, the apparatus, the conditions, the processing, or the interpretive basin. A paper that omits its registration lineage makes these possibilities difficult to separate.

22.6 The reader as a scientific instrument

The scientific reader is not passive. They re-register the paper through a trained symbolic landscape. Expertise deepens useful basins but can also create rigidity. A dominant theory may cause anomalous registrations to be assimilated too quickly.

Critical reading therefore includes re-measurement of one's own recognition. The reader asks whether the text produced the trajectory or merely triggered an already prepared model.

Part VIII

Text-within-Text

The Symbolic Realm as Renewed Physical Instantiation

23.1 Text is not an immaterial container

The phrase **text-within-text** names the condition that every claim, model, argument, and definition available to us is already symbolic. We cannot step outside finite symbols and compare them directly with an unsymbolised world.

This does not place language in an immaterial realm. Every available symbol is physically instantiated. Text persists through ink, sound, digital state, memory, gesture, and repeated re-registration.

Proposition

We remain within text-within-text, but text is continually renewed through physical registration.

23.2 The recursive generonic chain

A registration in one system can become an exogenous input to another:

$$R_A \rightarrow G_B \rightarrow R_B. \quad (23.1)$$

R_B may then be externalised and registered by C :

$$R_A \rightarrow R_B \rightarrow R_C \rightarrow \dots \quad (23.2)$$

The symbolic realm is therefore a recursive network of finite generonic events. Its continuity is active, not given.

23.3 Digital symbols remain physical

Digital language can appear especially abstract. A file is said to contain text independent of screen, device, or location. Yet the file persists only through physical states and error-tolerant re-registrations across hardware and protocols.

A character may be transformed through

$$R_{\text{keyboard}} \rightarrow R_{\text{code}} \rightarrow R_{\text{storage}} \rightarrow R_{\text{network}} \rightarrow R_{\text{display}}. \quad (23.3)$$

The symbolic identity is maintained by engineered admissibility basins. Error correction, encoding standards, and checksums are technologies of re-registration.

23.4 Text acts through re-registration

A law, equation, religious text, software instruction, or personal letter has no social effect merely by existing as an unread mark. It becomes active when registered by systems capable of continuation.

This distinguishes persistence from function. An archive may preserve a registration for centuries while no active trajectory develops from it. Rediscovery creates a new re-registration event and a new historical path.

23.5 No final symbolic foundation

Because definitions are themselves text, no definition can provide a non-symbolic foundation for language. Each explanatory term points to further registrations and trajectories. This does not produce infinite regress in practice. Systems halt when the available basin is sufficient for the task.

The absence of a final non-symbolic definition is not a failure. It is the condition of finite symbolic life.

23.6 The role of exogenous renewal

Text-within-text can become closed and self-confirming if no new exogenous registration enters. Models may elaborate themselves while losing contact with measurement. New instruments, experiences, and artefacts perturb the symbolic landscape and create possibilities not derivable from existing text alone.

The generonic boundary is therefore the renewing edge of text-within-text.

Cultural Continuity as Re-registration

24.1 Culture does not store meaning unchanged

Cultural continuity is often described as the transmission of ideas across generations. The registration framework replaces transmission with repeated material and social renewal.

$$R_{t_1} \rightarrow R_{t_2} \rightarrow \cdots \rightarrow R_{t_n}. \quad (24.1)$$

Each stage may involve copying, recitation, translation, commentary, institutional selection, technological conversion, or loss. The lineage persists when later systems can re-register enough structure to form related trajectories.

24.2 Tradition as a basin

A tradition is not one unchanged object. It is a deep cultural basin produced by repeated registrations and authorised continuations. Ritual, education, canonical texts, monuments, and anniversaries reinforce the basin.

The basin can stabilise identity while permitting variation. Different communities may occupy neighbouring regions and dispute which continuation is authentic.

24.3 Archives preserve registrations, not the past itself

An archive contains present artefacts with provenance pointing toward earlier events. Historical knowledge arises through re-registration and reconstruction of these surviving marks.

$$R_{\text{archive}} \rightarrow R_{\text{historian}} \rightarrow \widehat{\mathcal{T}}_{\text{past}}. \quad (24.2)$$

The reconstructed past is constrained by the artefacts but is not identical with the events that produced them.

This gives provenance a central role. A detached document may remain legible while losing the relations needed for responsible reconstruction.

24.4 Loss and silence

Cultural lineages can end when registrations decay, languages disappear, or admissibility systems collapse. The absence of a surviving registration is not evidence that no interaction occurred. It is a boundary on present symbolic access.

History is therefore shaped by generonic survival. Durable media, institutional power, and copying practices determine which trajectories remain available.

24.5 Revival is new construction

A revived language, restored ritual, or rediscovered text does not simply return unchanged. Present systems re-register surviving materials and construct a new lineage under contemporary conditions.

The revival may be deeply connected to the past while still being a new generonic event. This finite account permits continuity without pretending to erase historical discontinuity.

24.6 Cultural responsibility

To preserve a symbol is to preserve the possibility of future re-registration. Good preservation retains not only the visible mark but enough provenance, context, and material information for later reconstruction.

The cultural archive is therefore a generonic infrastructure. It does not contain the past; it sustains future measurement of surviving registrations.

Translation as Cross-basin Re-registration

25.1 No identical semantic cargo

Translation is often imagined as moving one meaning from a source language into equivalent words in a target language. This picture assumes that the meaning exists independently of both symbolic systems.

A registration account begins with a source trajectory:

$$\mathcal{T}_A \rightarrow R_A \rightarrow \hat{\mathcal{T}}_{\text{translator}} \rightarrow R_B \rightarrow \mathcal{T}_B. \quad (25.1)$$

The translator re-registers the source, reconstructs a functional trajectory, and externalises a new sequence within another basin system.

25.2 Languages partition differently

Languages do not provide interchangeable labels for one fixed conceptual grid. Their symbolic lineages stabilise different distinctions, overlaps, grammatical relations, and historical associations.

The target registration therefore cannot be required to equal the source:

$$R_A \neq R_B. \quad (25.2)$$

The practical aim is measured functional relation:

$$\mathcal{T}_A \sim_{P,C,H} \mathcal{T}_B, \quad (25.3)$$

where P is the purpose of the translation.

25.3 The translator as reader and writer

Translation combines re-registration and external registration. The translator is first a reader, then a writer, and repeatedly becomes a reader of the emerging target text.

$$R_A \rightarrow \hat{\mathcal{T}}_T \rightarrow R_B \rightarrow R'_T \rightarrow \dots \quad (25.4)$$

This iterative loop explains why translation is constructive rather than mechanical.

25.4 Provenance and visible uncertainty

A responsible translation should make important uncertainty visible. Notes, alternative terms, retained source words, and historical commentary can preserve trajectory that would otherwise disappear.

Perfect fluency may increase compression by making a difficult source appear more settled than it is. Literalism may preserve form while destroying functional continuation. The appropriate balance depends on purpose and readership.

25.5 Multiple admissible translations

Several target trajectories may be admissible without being identical. Their differences reveal dimensions of the source that no single target registration can preserve simultaneously.

This does not mean all translations are equally adequate. They can be compared under explicit criteria: lexical relation, historical provenance, rhythm, technical use, legal consequence, or explanatory clarity.

25.6 Machine translation

A machine translation system re-registers source tokens into internal numerical states and generates target tokens. It can reproduce strong statistical basins without sharing the human historical trajectory in the same form.

The output becomes culturally active only when re-registered by readers. Its adequacy should therefore be measured in the target trajectories it supports, not merely token similarity.

Part IX

Formal Foundations

A Preliminary Calculus of Registration

26.1 Purpose and limits

The mathematics in this chapter is deliberately preliminary. Its purpose is to discipline the lineage, not to create an appearance of completeness. Every symbol in the formalism is itself a finite registration, and no equation is permitted to erase the conditions of its use.

Let:

- $\mathcal{X}$ denote an exogenous interactional domain;
- $\mathcal{S}_A$ denote the symbolic domain locally available to system A ;
- G_A denote the generonic operation of A ;
- R_A denote a registration produced by A ;
- H_A denote the provenance and prior symbolic history of A ;
- α_A denote the local Alphonic constraint;
- δ_A denote registration uncertainty;
- $\mathcal{A}_A$ denote the relevant admissibility conditions.

26.2 Primary registration

For an interaction $I \in \mathcal{X}$, a registration is

$$R_A = G_A(I \mid C_A, \tau_A, \alpha_A, \delta_A, H_A, \mathcal{A}_A). \quad (26.1)$$

The vertical bar indicates conditioning rather than strict causal completeness. The expression says that the finite result cannot be detached from the registering arrangement.

26.3 Re-registration

Given an external registration R_A , system B produces

$$R_B = G_B(R_A \mid C_B, \tau_B, \alpha_B, \delta_B, H_B, \mathcal{A}_B). \quad (26.2)$$

The non-identity condition is

$$R_A \neq R_B. \quad (26.3)$$

The functional relation is

$$R_A \sim_{\mathcal{A}} R_B. \quad (26.4)$$

The relation $\sim_{\mathcal{A}}$ is not assumed to be universal or perfectly symmetric. In some practices, R_B may be accepted as a continuation of R_A while the reverse relation is not meaningful.

26.4 Registration update

A registration changes the history of the receiving system:

$$H_A^{t+1} = U(H_A^t, R_A^t), \quad (26.5)$$

where U is an update relation. This captures the fact that a later re-registration occurs in a changed system.

26.5 Recognition

Recognition is a relation between a new registration and an established basin:

$$\text{Recog}_A(R_t \mid H_A, C_t) \rightarrow \mathcal{B}_S. \quad (26.6)$$

For ambiguous cases:

$$\text{Recog}_A(R_t) \rightarrow \{(\mathcal{B}_{S_1}, w_1), \dots, (\mathcal{B}_{S_k}, w_k)\}, \quad (26.7)$$

where the weights w_j are finite symbolic estimates of basin support, not metaphysical probabilities.

26.6 Functional Symbolic Trajectory

A trajectory is

$$\mathcal{T}_n = (R_1, R_2, \dots, R_n; C, H, \delta, \mathcal{A}). \quad (26.8)$$

A continuation operation is

$$\mathcal{T}_{n+1} = K(\mathcal{T}_n, R_{n+1}). \quad (26.9)$$

A local halting condition for purpose P_A is

$$\text{Halt}(\mathcal{T}_n \mid P_A) = 1. \quad (26.10)$$

26.7 Endogenous derivation

Given registrations $R_1, \dots, R_n$, an endogenous symbol is

$$S_d = F(R_1, \dots, R_n \mid M, H, \delta). \quad (26.11)$$

The conditioning by M makes model dependence explicit. A derived symbol is not promoted to exogenous status by exact notation.

26.8 Prediction and comparison

A model produces a predicted registration

$$\hat{R}_{n+1} = P(M, \mathcal{T}_n). \quad (26.12)$$

A later interaction produces

$$R_{n+1} = G_A(I_{n+1} \mid C, \tau, \alpha, \delta, H, \mathcal{A}). \quad (26.13)$$

The scientific comparison is

$$\hat{R}_{n+1} \sim_{\delta, \mathcal{A}} R_{n+1}. \quad (26.14)$$

This comparison is the measurable site of model evaluation.

26.9 Compression

A compression operation is

$$\text{Comp} : \mathcal{T} \rightarrow S_c. \quad (26.15)$$

The omitted trajectory can be denoted

$$D_{\mathcal{T}} = \mathcal{T} \setminus \text{Comp}(\mathcal{T}). \quad (26.16)$$

A future quantitative development may define drag through differences in reconstruction when varying amounts of provenance are restored:

$$D_{\text{rec}} = d(\text{Recon}(S_c), \text{Recon}(S_c, H, \delta, C)). \quad (26.17)$$

The distance d must itself be constructed from finite registrations and explicit purpose.

26.10 A finite caution

This calculus is not a claim that the symbolic system has been reduced to equations. The equations are compressed registration tools. Their admissibility depends upon whether they help preserve distinctions that ordinary language was hiding.

Principles of Symbolic Registration

27.1 The role of principles

The following principles collect the central commitments of the monograph. They are not presented as timeless axioms imposed upon the world. They are working rules for maintaining finite symbolic lineage within Geofinitism and Finite Symbolic Mechanics.

27.2 Principle I: Finite instantiation

Every symbol available to a physical or social system must be finitely instantiated. A symbol with no extent, duration, substrate, or possible registration is not available to measurement.

27.3 Principle II: Generonic origin

Every first local symbol arises through a generonic registration. The registration may be biological, instrumental, computational, or institutional, but a finite distinction must become available.

27.4 Principle III: Registration non-identity

A registration is not identical to the interaction from which it is produced:

$$R \neq I. \quad (27.1)$$

The registration is constrained by the interaction and shaped by the registering arrangement.

27.5 Principle IV: Re-registration non-identity

A re-registered symbol is not physically identical to its antecedent:

$$R_A \neq R_B. \quad (27.2)$$

Continuity is maintained through admissible relation.

27.6 Principle V: Historical relatedness

Symbolic persistence is carried by a lineage of finite registrations, not by an abstract type outside measurement.

$$\mathcal{L}_S = (R_1 \sim R_2 \sim \cdots \sim R_n). \quad (27.3)$$

27.7 Principle VI: Registration precedes representation

A finite distinction may be registered before it is interpreted. Representation and modelling are later symbolic operations.

27.8 Principle VII: Derived symbols are not registrations

An endogenous mathematical or computational result does not become a new exogenous registration merely because it is precise or useful.

27.9 Principle VIII: Compression removes trajectory

Every symbolic compression omits some conditions, provenance, uncertainty, or relational structure. The omitted trajectory can return as symbolic drag.

27.10 Principle IX: Reading is re-registration

Reading is an exogenous measurement of already registered symbols. The reader produces new local registrations and reconstructs a trajectory.

27.11 Principle X: Meaning is reconstructed

Meaning is not transferred as an object. It is a locally realised Functional Symbolic Trajectory constrained by external registrations and historical basins.

27.12 Principle XI: Provenance is constitutive

Provenance forms part of a registration's identity. A mark detached from its lineage is a stronger compression, not the same complete registration.

27.13 Principle XII: Re-registration changes the system

Every registration becomes part of the conditions of future registration. The receiving system is changed, however slightly.

27.14 Principle XIII: Model-world distinction

A model can organise registrations and predict future registrations without establishing identity between its internal entities and the world beyond measurement.

27.15 Principle XIV: Exogenous renewal

New symbolic possibilities arise when artefacts or interactions create registrations unavailable to the existing system. Measurement renewal is a driver of symbolic epochs.

27.16 Principle XV: Finite admissibility

All claims of symbolic identity, equivalence, correctness, or reconstruction are made under finite admissibility conditions. These conditions should be exposed when foundational consequences depend upon them.

27.17 A compact statement

The principles can be compressed into one lineage:

$$\boxed{I \rightarrow R \rightarrow \mathcal{L} \rightarrow \mathcal{T} \rightarrow M \rightarrow \hat{R} \sim R_{\text{new}}} \quad (27.4)$$

The compression is useful only because the preceding chapters make it unfoldable.

Part X

Consequences and Applications

Implications for Linguistics and Philosophy of Language

28.1 Before semantics

Most theories of language begin with signs, words, meanings, grammar, reference, or use. Registration asks an earlier question: how does any finite mark become locally available as a sign at all?

This does not replace linguistics. It supplies a generonic layer beneath linguistic description. Phonemes, graphemes, words, and syntactic structures all depend upon repeated registration and recognition.

28.2 The sign is a lineage

A sign need not be divided into an abstract form and a material vehicle. It can be described as a lineage of registrations stabilised through a basin of use.

The relation between sign and referent then becomes a later symbolic trajectory, not a primitive bridge from mark to world.

28.3 Reference as modelled continuation

When a word is said to refer, a community has stabilised a trajectory linking registrations of the word to registrations arising in other interactions. The reference is functional and historical:

$$R_{\text{word}} \leftrightarrow \{R_{\text{interaction}} \text{ extunder } H, C, \mathcal{A}\}. \quad (28.1)$$

This relation can be strong without being a direct copy relation.

28.4 Rules as registered practices

A linguistic rule exists through examples, corrections, texts, teaching, and repeated use. It is not available independently of the registrations through which it is enacted.

Rule-following can therefore be described as basin-guided continuation rather than consultation of an abstract rule object.

28.5 Private language and public lineage

A wholly private symbol would still require local registration and repeated recognition. Without stabilising re-registration, even the individual could not maintain its identity. Public language adds social lineages and shared admissibility, but the foundational requirement is already finite and generonic.

28.6 The philosophical gain

Registration clarifies several longstanding tensions without claiming to solve them by definition:

- signs are physically finite yet historically extended;
- meanings are locally reconstructed yet socially constrained;
- identity is stable yet dynamical;
- reference can be functional without transparent access to the world;
- rules can guide without existing outside their registered practices.

The gain is not a new abstract theory of meaning. It is a measurable lineage for the events that every theory already presupposes.

Implications for Education and Learning

29.1 Learning as basin construction

A learner does not acquire a word by receiving its meaning. Learning occurs through repeated registrations across varied contexts:

$$R_1, R_2, \dots, R_n \rightarrow \mathcal{B}_S. \quad (29.1)$$

The basin becomes deep enough for recognition and flexible enough for continuation.

29.2 Why isolated definitions fail

A definition is one external registration. It may constrain a trajectory, but it cannot supply the full lineage of use. Learners often repeat a definition without being able to continue the concept in a new situation.

Examples, contrasts, errors, and applications provide additional trajectories. They thicken the basin and reveal its boundaries.

29.3 Repetition and variation

Exact repetition deepens a narrow groove. Variation teaches the wider basin. Both are needed.

$$\text{repetition} \rightarrow \text{stability}, \quad (29.2)$$

$$\text{variation} \rightarrow \text{generalisation}. \quad (29.3)$$

This distinction is especially important in small training sets, whether for children or artificial models. A few highly repeated examples can create a reliable local path, but thousands of varied on-ramps may be needed for robust inference.

29.4 Error as basin evidence

A learner's error reveals the basin into which a registration settled. Correction is most effective when it changes the trajectory rather than merely marking the output wrong.

A teacher can ask:

- What did the learner register?
- Which prior basin captured it?
- Which missing distinction would redirect the trajectory?

This is more informative than assuming that the correct meaning failed to transfer.

29.5 Reading instruction

Early reading develops layered basins: visual distinctions, letter families, phonetic continuations, lexical forms, and semantic trajectories. Fluency occurs when these measurements become compressed into rapid recognition.

The framework predicts that apparent reading difficulty can arise at different levels. A learner may have graphical stability but weak phonetic linkage, or lexical recognition without adequate semantic trajectory.

29.6 Technical education

Specialist language should be introduced with provenance and interactional examples. A formula presented without the measurements and operations from which it arose becomes a detached symbolic compression.

Education should therefore teach both the compressed tool and its unfoldable lineage.

Implications for Artificial Language Systems

30.1 Machine registration

An artificial language system receives external symbolic artefacts through an engineered generonic chain. Text is tokenised, encoded, embedded, transformed, and decoded. Each stage is finite and physically instantiated.

A simplified relation is

$$R_{\text{text}} \rightarrow R_{\text{token}} \rightarrow R_{\text{embedding}} \rightarrow \mathcal{T}_{\text{model}} \rightarrow R_{\text{output}}. \quad (30.1)$$

The token is a machine re-registration of the external text, not the text itself.

30.2 Tokenisation as compression

Tokenisation partitions a symbolic lineage according to a finite vocabulary. It can preserve common trajectories efficiently while splitting unfamiliar forms. The choice of tokens shapes the basins available to the model.

A model trained on token identifiers does not encounter letters, sound, bodies, or instruments unless those trajectories are externally encoded. Its symbolic world is bounded by the registrations made available through the training pipeline.

30.3 Training as basin shaping

Training repeatedly adjusts the model in response to symbolic trajectories. Common sequences form deep basins; rare sequences remain shallow. Large corpora create immense overlap, allowing apparently novel prompts to enter nearby trajectories.

A small Takens-Based Transformer must construct basins deliberately. Long and varied run-ins are needed so that the model does not confuse superficially similar trajectories. Repeated copies can deepen a specific groove, but generalisation requires controlled variation.

30.4 Endogenous output and exogenous checking

A language model produces endogenous symbolic continuations. These are not new registrations of the external world unless the model calls an instrument or tool that creates one.

$$\text{model continuation} = S_d, \quad \text{tool result} = R_e. \quad (30.2)$$

This distinction provides a clean basis for tool use. The model should know when it is continuing within text and when it has received a fresh external registration.

30.5 Hallucination as unsupported continuation

A hallucination occurs when a well-formed endogenous trajectory is presented as though supported by an exogenous registration or reliable provenance. The problem is not simply false wording. It is lineage misclassification.

A registration-aware system would mark:

- retrieved registration;
- derived symbol;
- model inference;
- uncertainty;
- absent provenance.

30.6 The model as instrument

A language model can function as an instrument for trajectory initialisation, comparison, and continuation. Its outputs remain text-within-text. Their value arises from the relational geometry reconstructed from training and dialogue.

The human user supplies halting conditions, external measurement, and judgement. The coupled process can create new symbolic constructions without confusing the model's continuation with the world.

Implications for Scientific Language

31.1 Grammar can cross the boundary silently

Scientific statements often move from model to world through grammar rather than argument. “The model has discrete states” becomes “nature is discrete”. “The apparatus produced a localised registration” becomes “a particle arrived”. “The equations are invariant” becomes “reality is invariant”.

Registration-aware writing makes the transition visible.

31.2 A vocabulary of lineage

The following verbs can preserve distinctions:

- *registered* for exogenous measurement output;
- *derived* for endogenous mathematical construction;
- *represented* for a symbolic relation;
- *modelled* for organised theoretical structure;
- *interpreted* for a proposed explanatory trajectory;
- *conjectured* for a continuation beyond present registration.

These words need not be used mechanically. Their value lies in preventing every stage from being compressed into *measured* or *is*.

31.3 Examples of reformulation

Instead of

Space is quantised.

write

The model admits discrete geometric observables under its stated assumptions.

Instead of

The detector measured a particle.

write

The apparatus produced a localised registration interpreted within the particle model.

Instead of

The Planck length is the smallest unit of space.

write

The Planck length is a derived symbolic scale formed from constants belonging to several physical models; no Planck-sized interval has been directly registered.

31.4 Plain language and precision

Registration-aware writing need not become jargon-heavy. In fact, it often becomes clearer because the agent and operation are restored. “The analysis derived” is more honest than “the universe revealed”.

The aim is not endless qualification. It is accurate compression. Once a lineage has been established, a shorter term can be used locally. The reader should be able to unfold it when required.

31.5 Scientific disagreement

Many disputes can be clarified by locating disagreement at the correct stage. Researchers may agree on registrations and disagree on interpretation. They may agree on equations and disagree on world claims. They may appear to disagree on data when the real difference lies in admissibility or apparatus.

A registration table can separate:

$$(R_e, S_d, I_m, O_c). \tag{31.1}$$

This simple taxonomy can improve peer review and public communication.

31.6 The discipline of not knowing

A registration-aware science can state where measurement ends without treating that boundary as defeat. The phrase “the model does not establish” is a precise result. It preserves space for new instruments and new language.

Registration in Geofinitism and Finite Symbolic Mechanics

32.1 The missing layer

Registration adds a necessary layer between interaction and symbol. Before the term was available, the generonic boundary named the crossing, and the finite symbol named the outcome, but the event and lineage connecting them remained compressed.

The revised spine is

$$\boxed{\text{interaction} \rightarrow \text{registration} \rightarrow \text{symbolic trajectory} \rightarrow \text{model}} \quad (32.1)$$

Re-registration then explains how external symbols enter new systems:

$$\boxed{\text{external symbolic persistence} \rightarrow \text{re-registration} \rightarrow \text{trajectory reconstruction}} \quad (32.2)$$

32.2 Connection to the five pillars

Registration connects directly to the recurring Geofinite pillars.

32.2.1 Finite symbol

The registration is the physical and historical event by which a finite symbol becomes locally available.

32.2.2 Alphonic Limit

A registration must meet a local condition of distinguishability. No dimensionless mark can function without finite extent.

32.2.3 Uncertainty

The registration carries uncertainty from its interactional formation and from later re-registration.

32.2.4 Provenance

A registration is constituted by its lineage. Detaching the mark produces a stronger compression.

32.2.5 Admissibility and consensus

A community determines which variations count as the same symbol, which measurements count as valid, and which continuations count as legitimate.

32.3 Connection to symbolic drag

Compression removes registration conditions. The resulting symbolic drag appears when the compressed expression is used outside the basin that stabilised it.

Registration therefore gives symbolic drag a concrete origin:

$$D \sim \text{omitted registration lineage.} \quad (32.3)$$

32.4 Connection to Functional Symbolic Trajectories

A Functional Symbolic Trajectory is no longer an abstract sequence of symbols. It is a relation among finite registrations with provenance, uncertainty, and admissibility.

The trajectory has physical entry points and historical renewal. This strengthens the bridge between nonlinear dynamical systems and language.

32.5 Connection to text-within-text

Registration explains how text-within-text remains physically grounded. We cannot leave the symbolic realm through thought alone, but new exogenous interactions can produce new registrations. These registrations perturb the existing landscape and permit new models.

The symbolic realm is therefore closed with respect to direct unsymbolised access but open to generonic renewal.

32.6 Connection to the Takens-Based Transformer

The TBT reconstructs trajectory from finite registered sequences. Basin construction, delay relations, and continuation can now be described in registration language. Tool calls provide fresh exogenous registrations; model continuations remain endogenous symbols.

This distinction may become essential for small, interpretable systems that must preserve provenance.

32.7 A foundational contribution

Registration is not an optional vocabulary change. It supplies:

1. the named product of the generonic crossing;

2. the physical placement of reading;
3. a finite mechanism of symbolic persistence;
4. a distinction between measurement and derivation;
5. a bridge between language and scientific instruments;
6. a basis for reconstruction without semantic transfer;
7. a route from finite sequence to dynamical phase-space description.

32.8 The world does not enter as text

The monograph can now return to its opening sentence. You are reading these words. Each word remains an external registration until measured. Familiar forms fall into deep basins; unfamiliar forms create new local registrations. The sequence constrains a trajectory that is authored within the reader.

The world does not enter the symbolic realm unchanged. Interaction becomes registration. Registration becomes trajectory. Trajectory becomes model. A new measurement may later perturb the model, but no model can retrospectively turn itself into the world beyond its registrations.

Registration is the finite hinge between interaction and text. Re-registration is the finite hinge by which text continues.

Glossary of Central Terms

Admissibility

The finite rules and practices under which a registration, relation, or continuation is accepted as usable. Admissibility may be instrumental, linguistic, mathematical, legal, social, or scientific.

Alphonic condition

The local requirement that a finite distinction possess sufficient extent, stability, contrast, or duration to function as a symbol within a particular registering system.

Compression

An endogenous symbolic operation that retains selected features of a registration or trajectory while omitting others. Compression is necessary for language but can create symbolic drag when its omissions are forgotten.

Endogenous symbolic operation

A transformation performed upon symbols already available within a symbolic system, without a fresh exogenous measurement crossing.

Exogenous interaction

An interaction that is external relative to the present symbolic system and may participate in a new registration.

Finite symbol

A physically instantiated, locally distinguishable mark available for symbolic continuation.

Functional Symbolic Trajectory

A finite ordered relation among registrations and derived symbols carrying context, uncertainty, provenance, admissibility, and possible continuation.

Generon

A finite biological, instrumental, computational, or institutional arrangement capable of producing registrations from interactions.

Generonic boundary

The functional transition through which an interaction becomes locally available as a finite symbol.

Provenance

The historical lineage by which a registration came to exist, including apparatus, conditions, transformations, copying, storage, and earlier symbolic relations.

Recognition

The relation of a new registration to an established symbolic basin.

Recognition basin

A historically formed region of admissible registrations and continuations within which a finite mark is treated as a particular symbol or use.

Registration

The finite symbolic instantiation produced when an interaction crosses a generonic boundary and becomes available for continuation.

Re-registration

The generonic event through which an externally instantiated symbol becomes newly instantiated within another symbolic occasion or system.

Representation

An endogenous symbolic interpretation in which one or more registrations are treated as standing for, relating to, or modelling something.

Semantic thickness

The finite spread of overlapping historical and contextual trajectories associated with a symbol.

Symbolic drag

The residual consequence of trajectory, provenance, or uncertainty removed by symbolic compression.

Symbolic lineage

A historical sequence of finite registrations treated as admissible continuations of a symbol.

Text-within-text

The condition that all available claims, models, and definitions are already finite symbolic constructions, even though new exogenous interactions can renew the symbolic landscape through registration.

Trajectory reconstruction

The formation of a higher-dimensional functional relation from an ordered sequence of registrations and their delayed dependencies.

Notation

Symbol	Working meaning
I	Exogenous interaction participating in registration.
A	Registering apparatus, organism, or institutional arrangement.
C	Local conditions of registration or reconstruction.
τ	Finite interaction or integration interval.
α	Local Alphonic condition of distinguishability.
δ	Finite uncertainty structure.
H	Provenance and accumulated symbolic history.
$\mathcal{A}$	Admissibility rules or practice.
G_A	Generonic operation associated with system A .
R_A	Registration produced by system A .
S_d	Endogenous derived symbol.
M	Symbolic model.
$\mathcal{B}_S$	Recognition or semantic basin associated with symbol S .
$\mathcal{L}_S$	Historical lineage of registrations associated with S .
$\mathcal{T}$	Functional Symbolic Trajectory.
$\sim$	Measured or admissible relatedness, not exact identity.
Comp	Compression operation.
D_R	Heuristic registration or symbolic drag.
$\hat{R}$	Predicted registration.
$\widehat{\mathcal{M}}$	Locally reconstructed manifold or attractor model.

The notation is intentionally economical. Its purpose is to stop distinct operations from collapsing into one another. It should not be expanded merely to give the framework an appearance of formal maturity.

Core Registration Diagrams

.1 Primary registration

$$\text{interaction} \longrightarrow \boxed{\text{generonic boundary}} \longrightarrow \text{registration.} \quad (4)$$

.2 Re-registration

$$\text{external symbol} \longrightarrow \boxed{\text{reader or receiving Generon}} \longrightarrow \text{new registration.} \quad (5)$$

.3 Writing and reading

$$\mathcal{T}_A \longrightarrow R_{\text{external}} \longrightarrow R_B \longrightarrow \mathcal{T}_B. \quad (6)$$

.4 Scientific lineage

$$I \longrightarrow R_e \longrightarrow S_d \longrightarrow M \longrightarrow R_{\text{text}} \longrightarrow R_{\text{reader}}. \quad (7)$$

.5 Symbolic lineage

$$R_1 \sim R_2 \sim R_3 \sim \dots \sim R_n. \quad (8)$$

.6 Registration, recognition, and reconstruction

$$I \longrightarrow R \longrightarrow \mathcal{B}_S \longrightarrow \hat{\mathcal{T}} \longrightarrow \text{continuation.} \quad (9)$$

.7 Model testing

$$\{R_1, \dots, R_n\} \longrightarrow M \longrightarrow \hat{R}_{n+1} \sim R_{n+1}. \quad (10)$$

Worked Examples

.8 Reading a familiar word

The printed word *clock* is externally registered. The reader measures the mark and produces R_{clock} . Because repeated earlier encounters have formed a deep basin, recognition is rapid:

$$R_{\text{clock}} \rightarrow \mathcal{B}_{\text{clock}}. \quad (11)$$

The basin includes devices, timekeeping, verbs such as timing, technical histories, and local sentence expectations. The word is not read by retrieving one fixed definition.

.9 Encountering a new technical term

A reader encounters *generonic*. The letter sequence is graphically registered. Its morphology may suggest a relation to generation, but no stable technical basin exists. The surrounding definitions and repeated uses create new local trajectories. After enough re-registrations, the term becomes familiar.

.10 A damaged manuscript

A partially missing word produces an incomplete registration. Historical spelling, surrounding grammar, and repeated letter forms support candidate reconstructions. The final reading should be marked with uncertainty because recognition exceeds the surviving material registration.

.11 Re-reading a childhood book

The external marks remain materially stable. The adult reader carries a different history, so the re-registration enters changed basins. The later trajectory may reveal themes unavailable to the child. The book has not transferred a hidden second meaning; the relation has changed.

.12 A spoken sentence in noise

The acoustic registration is partial. Context predicts likely continuations. A listener hears an expected word that was not spoken. This is recognition-driven completion, not

fabrication without constraint. The noise widened the basin enough for expectation to dominate.

.13 A scientific instrument output

A detector produces a voltage, which is digitised, filtered, and displayed. The scientist sees a plotted point. The first registration is not the point on the graph. The graph is a late re-registration after several endogenous and generonic stages.

.14 A derived physical scale

Measured and conventionally fixed quantities enter an equation that produces a new scale. The scale is an endogenous symbol. A later interpretation treats it as a minimum structure of the world. Registration analysis separates the valid derivation from the unregistered world claim.

.15 A language model response

A prompt is tokenised and re-registered within a model. The model reconstructs a basin and produces an endogenous continuation. The displayed words become external registrations. A human re-registers them and judges their usefulness. No model output becomes external fact without a further measurement lineage.

.16 Translation

A translator reads a source sentence, reconstructs its trajectory, and writes a target sentence. The target is not the same symbol sequence. It is a new registration intended to produce a related trajectory for another reader.

.17 Legal quotation

A sentence removed from its surrounding testimony remains graphically intact but loses provenance and context. Its functional registration changes. A court may restore the lineage through transcript, speaker identity, timing, and cross-examination.

Historical and Research Orientation

This draft intentionally establishes the registration framework before conducting a full historical comparison. The later research edition should examine where the present vocabulary overlaps with, departs from, or reframes earlier traditions.

.18 Signs and interpretation

A historical review should compare registration with traditions that treat signs through relations among mark, object, and interpreter. The distinctive Geofinite question is prior: which finite interaction produces the locally available mark, and how does its lineage remain measurable?

.19 Meaning as use

Accounts that locate meaning in use provide an important neighbour to Functional Symbolic Trajectories. Registration adds the physical event through which a use becomes available and the re-registration mechanism through which practices continue.

.20 Information and communication

Classical information theory deliberately abstracts from semantic content in order to analyse symbol transmission. The present framework should not criticise that abstraction for failing to do what it did not attempt. The critical issue is the later expansion of channel language into a general model of semantic transfer.

.21 Embodied and enactive approaches

Approaches that treat cognition as embodied interaction share the rejection of a detached symbolic container. Registration may provide a sharper finite account of the point at which an interaction becomes symbolically available.

.22 Measurement theory

Scientific measurement theory offers extensive work on calibration, representation, uncertainty, and operational definition. A later edition should place the generonic boundary in detailed relation to this literature while retaining the distinction between registration and representation.

.23 Dynamical systems and language

Nonlinear dynamical accounts provide concepts of attractor, basin, delay, bifurcation, and reconstruction. The Geofinite contribution is to insist that every state used in such an account is a finite symbolic registration with extent and provenance.

.24 Takens and delay embedding

A formal research appendix should provide the exact historical statement of delay-embedding theorems, their assumptions, and the limits of their analogy with language. The present monograph uses Takens reconstruction as a disciplined model for relational sequence, not as an unqualified proof about semantic systems.

.25 Type and token

The registration-lineage account should be compared directly with established type-token theories. The central question is whether symbolic stability can be explained through finite historical relations without positing an abstract type beyond all registration.

.26 Future research programme

A later edition should include:

1. a sourced historical chapter;
2. experimental studies of reading as repeated registration;
3. formal measures of basin overlap and semantic thickness;
4. computational tests using the Takens-Based Transformer;
5. case studies in scientific model-world conflation;
6. archival and translation studies based on registration lineage;
7. a fuller calculus of symbolic drag.

Closing statement

The world does not enter the symbolic realm unchanged. An interaction crosses a generonic boundary and becomes a registration. A registration is not the world. It is a finite symbolic residue of an interaction. A symbol does not persist through abstract identity. It persists through a lineage of re-registrations. Reading is not semantic transfer. It is exogenous measurement followed by local symbolic reconstruction. We remain within text-within-text, but text is not immaterial. It is continually instantiated, measured, lost, renewed, and transformed through finite interaction.

Index

Alphonic condition, 19

finite symbol, 18

Functional Symbolic Trajectory, 67

Generon, 15

generonic boundary, 13

re-registration, v, 4, 27

registration, v, 17

text-within-text, 91