Below is a cleaned‑up, step‑by‑step presentation of our fractal‑topology notation, self‑reference and paradoxical decomposition, applied to

[\,\text{epigenetics},\,\text{EH}\,]\*(\text{primality}).

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1. Notational Primitives

Associative Pair:

[A,B],\quad \{A,B\},\quad (A,B),\quad <A,B>.

p \* q \;=\; [\,p,\,q\,]\quad (\text{or use other brackets as needed}).

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2. From a Single‑Type Model to a Fractal Topology

1. Special Case

Only one bracket (e.g. [.,.]), so all paths live in a uniform discrete network.

2. General Case

Allow mixed, nested bracket‑types.

Example:

{ [ ( {1,2}, <3,4> ), [5,6] ] }

Top‑level: {…} (binary set)

Inside: a digital pair [ … ] containing

1. an analog pair ( … ) of:

a binary set {1,2}

a spectrum <3,4>

2. another digital pair [5,6]

Because each nesting level chooses among four bracket‑types, the space of all well‑formed expressions is homeomorphic to a Cantor set Formal Structure

1. Type Alphabet

,(,),<,>}.

2. Well‑Formed Expression (WFE)

If are WFEs, then

are WFEs.

3. Path Monoid

with

\*:\mathcal{P}\times\mathcal{P}\to\mathcal{P},\quad

p \* q = [\,p,\,q\,]\quad(\text{or other bracket choice}).

4. Fractal Topology

Basis: sets of all WFEs sharing a fixed finite prefix of symbols. This yields a totally disconnected, perfect, compact space (Cantor‑like).

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4. Embedding Gödel‑Style Self‑Reference

Use an encoding .

Form the Gödel node

G(p) \;=\; [\,\ulcorner p\urcorner,\,p\,],

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5. Banach–Tarski Paradox in <…>

1. Select a “sphere” expression .

2. Using the Axiom of Choice, decompose

S \;=\; A\_1\cup\cdots\cup A\_5

3. Reassemble into two disjoint copies of .

Embedding these paradoxical cuts as subgraphs yields infinite entropic branching.

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6. Example:

[\,\text{epigenetics},\,\text{EH}\,]\*(\text{primality})

1. Encode the parts:

p\_1 = [\,\text{epigenetics},\,\text