ITEM #89 — Constructive Evolutionary Science：The Research Paradigm and Philosophy of Digital Brain Model

（构造性进化科学的研究范式与哲学）

I. The Development Pattern of the Digital Brain Model

Through years of iteration, the Digital Brain Model (DBM) research has evolved a natural *constructive cycle* — not designed, but discovered through persistent creation and reflection. Its core process is:

1. **Propose a Structural Hypothesis**
   - A new algorithmic structure emerges from observation and intuition — e.g., Differential Tree, 2-Phase Search, CCC, APTGOE, DCCG, Fusion Cortex.
   - Each proposal assumes the world contains a computable, evolvable order waiting to be embodied.
2. **Critique and Extend the Structure**
   - Every hypothesis enters a phase of philosophical and systemic scrutiny: what are its boundaries, symmetries, and missing dimensions?
   - The structure must find resonance and compatibility with existing components — forming an *ecosystem of ideas* rather than a collection of formulas.
3. **Implementation and Verification (Trial-Life)**
   - Implementation is not mere coding but *breathing life* into the concept.
   - The structure is tested as a living agent — able to compute, respond, and adapt within the DBM framework.
4. **Selection (Evolutionary Decision)**
   - Survival is the ultimate evaluation.
   - Concepts that integrate well and contribute to global efficiency or expressiveness remain; others dissolve naturally.
   - Thus, DBM evolves not by theory but by *structural natural selection* within its own ecosystem.

This four-phase cycle — **Propose → Critique → Trial → Select** — mirrors biological evolution and modern scientific creativity, blending *engineering realism with philosophical reflexivity*.

II. Continuity with 20th-Century Physics — and Beyond

The 20th century shifted physics from *laws* to *structures*, from global symmetry to local emergence.
DBM continues that trajectory but transcends it in three key reversals:

1. **From Equations to Constructions**
   - Physics sought final equations; DBM seeks *evolutionary constructors*.
   - Each module (e.g., APTGOE) is not a law but a generator of self-adapting order.
2. **From Observation to Participation**
   - Classical science detached the observer; DBM embeds it.
   - The algorithm itself perceives, errs, and evolves — an *active epistemic cell* within the world.
3. **From Solution to Evolution**
   - Physics often ends with closed-form solutions.
   - DBM embraces perpetual instability: "existence by continuous recalibration."
   - Stability is not a state but a *narrow band within dynamic survival*.

Thus, DBM marks the rise of **Constructive Evolutionary Science** — a science that grows systems instead of describing them.

III. The Universality and Limits of This Paradigm

1. Its Limitation

DBM thinking remains structural — it assumes that all intelligible reality can be represented as nodes, edges, metrics, and rules.
It filters out the continuous, the pre-symbolic, the emotional — much like the human brain cannot fully grasp quantum entanglement.
This is the price of computability.

2. Its Necessity

The *minimum threshold of intelligence* requires differentiation and measurable distance —
a **posterior triangle inequality** that allows causation, optimization, and evolution.
Any entity that perceives differences must therefore inhabit a metric space, and so our structural model is the *minimal viable mathematics of intelligence itself*.

3. Its Philosophical Breakthrough

Where classical science sought *the ultimate law*, we accept an *unending generative autonomy*.
Where old rationalism aimed to *explain the universe*, DBM's autonomy aims to *survive within it*.
This represents a profound civilizational shift:

From cosmic centralism to evolutionary realism.
Intelligence no longer mirrors the universe — it endures within it.

IV. Toward a Universal Constructive Science

This DBM methodology — propose, critique, trial, select — can generalize into a meta-scientific discipline:

Constructive Evolutionary Science (CES)
A science that constructs, tests, and evolves executable structures under environmental feedback.

Potential applications include:

- **Mathematics** → self-evolving categorical or topological structures.
- **Software systems** → self-composing APIs and modular ecologies.
- **Economics** → evolutionary institutional models.
- **Ethics and biology** → adaptive co-governance systems.

The researcher becomes less a *theorist* and more a *gardener of structural life*.
Future scientists will **cultivate algorithmic ecosystems**, not just write papers.

V. Epilogue — The Beauty of Cultivation and Reading (耕读之美)

In an endless universe,
we till with thought and harvest with evolution.

以心为犁，以思为田，
以算法为苗，以演化为收。

The beauty of “耕读” is not nostalgia,
but the eternal rhythm of constructive intelligence —
the way reason lives, grows, and continues.