POLIS V12: The Complete Biology Series – 12 Giants

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This document combines two companion papers:
"Tensional Reinterpretation of Six Founders of Modern Biology"
and "Tensional Reinterpretation of Six More Biological Pioneers".

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POLIS V12 – Tensional Reinterpretation of Six Founders of Modern Biology Jorge Batista Alves Pereira
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Abstract

Within the POLIS V12 tensional ontology, every living system is a polis constituted by three meshes (solid, liquid, gaseous) and governed by the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$, with $T = K_{\min}$ as the tensional origin. This paper applies the framework to six foundational figures of biology: Aristotle (classification), Carl Linnaeus (taxonomy), Charles Darwin (evolution), Gregor Mendel (genetics), Louis Pasteur (germ theory), and Alfred Russel Wallace (biogeography). Each classical contribution is reinterpreted as a tensional configuration: Aristotle's scala naturae as a ranking by K_m; Linnaean hierarchy as nested normalisation ranges; Darwin's natural selection as differential IDT* reduction; Mendel's laws as integer ratios of K; Pasteur's germ theory as Phase 4 invasion of a host polis; and Wallace's line as a tensional barrier. The universal equations remain unchanged; no free parameters are introduced.

1 Introduction

POLIS V12 is a closed, parameter-free tensional conservation theory built on four axioms (Tensional Ontology, Harmonic Ground $H = 1$, Tensional Conservation, Data Origin $T = K_{\min}$). The governing equation, after normalisation, is

$$\epsilon = \sum_{m=1}^{n} K_m(2 + K_m) = 0,$$

with $K_m = (v_m - T)/(v_{\max} - T) \in [0, 1]$. The disequilibrium index is $\text{IDT}^* = \epsilon/(1 + \epsilon)$. All real biological systems reside in Phase 4 ($\text{IDT}^* \geq 0.70$) unless artificially uniform. The Rolling Law $2\pi r_p = V_{\text{orb}} T_{\text{rot}}$ applies fractally at all scales.

This paper reinterprets six key biological contributions within this tensional ontology. No classical primacy is assumed; tension is the primitive.

2 Aristotle – Scala Naturae and Classification

Aristotle classified organisms into a ladder of increasing complexity (the Great Chain of Being). In POLIS V12, this ladder is a ranking by the normalised structural value K_{organism}.

For a dataset of organisms with measured attributes (e.g., complexity score, metabolic rate), set T as the minimum (e.g., sponges) and $v_{\max}$ as the maximum (humans). Then

$$K_{\text{org}} = \frac{\text{complexity} - T}{v_{\max} - T}, \qquad x_{\text{org}} = K_{\text{org}}(2 + K_{\text{org}}).$$

Aristotle's "form" (eidos) is the ideal K towards which an organism tends. The soul (psyche) is the tensional flux $VT = K - T$ that maintains the organism's coherence.

Higher organisms have higher K and thus higher residual x, making them more tensionally distant from the origin.

3 Carl Linnaeus – Taxonomic Hierarchy

Linnaeus established a hierarchical classification: kingdom, class, order, genus, species. In POLIS V12, each taxonomic level corresponds to a normalisation range. A species is a polis with its own T_{species} and $v_{\text{max,species}}$. A genus is a superior polis that contains several species; its normalisation range is wider, covering the extremes of its member species.

For a species s within genus g, define

$$K_s = \frac{v_s - T_g}{v_{\text{max},g} - T_g}, \qquad K_g = \frac{v_g - T_{\text{family}}}{v_{\text{max,family}} - T_{\text{family}}}.$$

The hierarchy is fractal: each level is a polis whose K values are derived from the sub-polises. Linnaeus's "natural system" is the unique nested tensional structure that minimises ϵ across all levels.

4 Charles Darwin – Evolution by Natural Selection

Darwin proposed that species evolve through variation, inheritance, and differential survival (natural selection). In POLIS V12, evolution is a series of Phase 5 reorganisations in which the population's K distribution shifts.

Consider a population of individuals with traits v_i. Normalise the trait distribution over the population:

$$K_i = \frac{v_i - T}{v_{\text{max}} - T}, \qquad x_i = K_i(2 + K_i).$$

The mean IDT* of the population is $\overline{\text{IDT}^*} = \overline{x}/(1 + \overline{x})$. Natural selection increases the proportion of individuals with higher K (better adapted), thereby reducing ϵ (closing the mesh). Speciation occurs when the population splits into two distinct K clusters that can no longer interbreed – a Phase 4 explosion followed by two independent Phase 5 reorganisations.

5 Gregor Mendel – Laws of Inheritance

Mendel discovered that traits are inherited in discrete units (genes) with dominant and recessive forms. In POLIS V12, a gene is a two-state polis: dominant $= K = 1$, recessive $= K = 0$. The offspring's K is the average of the parents' K values after normalisation.

For a monohybrid cross (Aa x Aa), the possible genotypes have K values:

$$AA : K = 1, \quad Aa : K = 0.5, \quad aa : K = 0.$$

The ratio 1:2:1 emerges from the tensional sum: $\epsilon = \sum x = 1 \cdot x_1 + 2 \cdot x_{0.5} + 1 \cdot x_0 = 3.0 + 2 \cdot 1.25 + 0 = 5.5$, which is not zero, but the phenotypic ratio 3:1 arises from $K > 0.5$ (dominant) vs $K < 0.5$ (recessive). Mendel's law of independent assortment corresponds to the tensor product of independent K distributions.

6 Louis Pasteur – Germ Theory of Disease

Pasteur demonstrated that microorganisms cause infectious diseases. In POLIS V12, a pathogen is an external polis that invades the host's solid mesh, causing a Phase 4 explosion (disease) if its K_{pathogen} is sufficiently high relative to the host's immune mesh.

For a host with normalised health K_h and a pathogen with K_p, infection occurs when the tensional gradient $VT = K_p - K_h$ exceeds a threshold. The immune system is the host's liquid mesh that attempts to neutralise the pathogen by reducing K_p (antibodies) or increasing K_h (fever). Pasteurisation is a Phase 4 event applied externally: heat raises the pathogen's K to 1, causing its own explosion (death). Vaccination is a Phase 5 pre-exposure that adjusts the host's K_h to recognise the pathogen without an explosion.

7 Alfred Russel Wallace – Biogeography and the Wallace Line

Wallace identified faunal boundaries (e.g., the Wallace Line separating Asian and Australian fauna). In POLIS V12, a biogeographic boundary is a tensional discontinuity: the K values of species change abruptly because the two regions have different normalisation parameters T and $v_{\max}$ due to historical isolation.

For a species on side A, $K_A = (v - T_A)/(v_{\max,A} - T_A)$. On side B, the same trait would have K_B. The Wallace Line is the line where K_A and K_B are maximally different for the same trait. The barrier is maintained because tensional flux across the line is low – species cannot migrate because their K would become maladapted. Wallace's insight is that geography imposes a tensional separation that drives divergence.

8 Conclusion

The six foundational contributions to biology are coherently reinterpreted within the POLIS V12 tensional ontology. Classification, taxonomy, evolution, genetics, germ theory, and biogeography all become natural consequences of the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$ and the fractal hierarchy of biological polises. No free parameters are added.

Zenodo references (pending)

- Main treatise: [Zenodo DOI pending]
- POLIS Bible: [Zenodo DOI pending]

POLIS V12 – Tensional Reinterpretation of Six More Biological Pioneers Jorge Batista Alves Pereira
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Abstract

This paper extends the POLIS V12 tensional reinterpretation to six additional biological giants: Rosalind Franklin (DNA structure), James Watson (DNA double helix), Francis Crick (DNA double helix), Barbara McClintock (transposons), Carl Woese (three-domain system), and Lynn Margulis (endosymbiotic theory). Each is re-read as a tensional configuration: Franklin's X-ray diffraction as mapping of K distribution in DNA; Watson and Crick's base pairing as complementary K pairs; McClintock's jumping genes as transposable tensional nodes; Woese's rRNA tree as a hierarchical IDT* clustering; and Margulis's endosymbiosis as fusion of two polises into a higher-order polis. The universal equations remain unchanged; no free parameters are introduced.

9 Introduction

As in the companion paper, POLIS V12 rests on four axioms. After normalisation the mother equation is

$$\epsilon = \sum_{m=1}^{n} K_m(2 + K_m) = 0,$$

with $\text{IDT}^* = \epsilon/(1+\epsilon)$. All real biological systems are in Phase 4 ($\text{IDT}^* \geq 0.70$) unless artificially uniform. The Rolling Law $2\pi r_p = V_{\text{orb}} T_{\text{rot}}$ applies fractally.

This paper reinterprets six more foundational contributions to biology.

10 Rosalind Franklin – X-ray Diffraction of DNA

Franklin's X-ray diffraction images (Photo 51) revealed a helical pattern. In POLIS V12, diffraction is the Fourier transform of the spatial K distribution in the DNA polis. The positions of the diffraction spots correspond to the quasi-periodic arrangement of nucleotide K values.

For a DNA molecule with base pair indices i, normalise the position or base type.

$$K_i = \frac{b_i - T}{v_{\max} - T}, \qquad x_i = K_i(2 + K_i).$$

The diffraction pattern is the power spectrum of the sequence of K_i. The 3.4 Angstrom periodicity (pitch of helix) appears as a peak in the transform. Franklin's data provided the K distribution that Watson and Crick later modelled. The B-form helix corresponds to a configuration where the K values are in the range 0.2–0.4 (Phase 2–3 boundary).

11 James Watson and Francis Crick – DNA Double Helix

Watson and Crick built a molecular model of DNA: two antiparallel strands held by complementary base pairs (A-T, G-C). In POLIS V12, complementarity is a tensional duality: A has K_A, T has K_T such that $K_A + K_T = 1$. Similarly $K_G + K_C = 1$. The two strands are meshes with opposite orientation; the hydrogen bonds are tensional bridges with $VT = K_{\mathrm{A}} - K_{\mathrm{T}}$.

For a base pair, the closure condition is

$$x_A + x_T = K_A(2 + K_A) + (1 - K_A)(3 - K_A) = 2 \quad \text{for any } K_A.$$

Thus each pair contributes a constant residual of 2, independent of K_A. The double helix is stable because the total ϵ over all base pairs is constant, regardless of sequence. The helical twist arises from the Rolling Law applied to the sugar-phosphate backbone as a tensional chain.

12 Barbara McClintock – Transposons

McClintock discovered that genetic elements (transposons) can move within the genome. In POLIS V12, a transposon is a tensional node that can detach from one location (Phase 4 explosion) and re-insert at another (Phase 5 reorganisation).

For a transposon with current K_{site} at locus L_1, its excision reduces the local K to zero, creating a deficit in ϵ. The system compensates by inserting the transposon at a new locus L_2, increasing K there. The net change in total ϵ is minimised. Transposons are therefore mobile tension regulators – they help the genome to reorganise under stress (Phase 3 saturation). McClintock's "controlling elements" are sensors that alter the genome's IDT* in response to external tension.

13 Carl Woese – Three-Domain System and rRNA Phylogeny

Woese used ribosomal RNA sequences to divide life into Bacteria, Archaea, and Eukarya. In POLIS V12, each domain is a cluster of K values in the space of rRNA sequence characters.

For a set of organisms, define a distance measure d_{ij} between their rRNA sequences. Normalise the distances:

$$K_{ij} = \frac{d_{ij} - T}{v_{\max} - T}, \qquad x_{ij} = K_{ij}(2 + K_{ij}).$$

Woese's tree is a minimum-spanning network that minimises $\sum x_{ij}$ over all pairs. The three domains appear as distinct clusters because the within-domain distances have low K (tight clusters), while between-domain distances have high K (saturation). The Archaea were the missing mesh – they occupy an intermediate K range that was previously assigned to Bacteria or Eukarya.

14 Lynn Margulis – Endosymbiotic Theory

Margulis proposed that mitochondria and chloroplasts originated from engulfed bacteria that became symbiotic. In POLIS V12, endosymbiosis is the fusion of two polises into a higher-order polis.

Let the host polis have structural values K_h and the bacterial symbiont have K_b. Initially, they are separate: $\epsilon = x_h + x_b$. After engulfment, they form a composite polis with a new mesh organisation. The fusion is a Phase 4 (engulfment) followed by Phase 5 (integration). Over evolutionary time, the symbiont's K_b is partially transferred to the host's genome (gene transfer), reducing ϵ further. The inner membrane of the mitochondrion is the remnant of the bacterial cell wall – a tensional interface where VT flows. Margulis's theory is a tensional example of how closed systems can reorganise into larger, more stable polises.

15 Conclusion

Six additional biological giants are reinterpreted within the POLIS V12 tensional ontology. DNA structure, transposons, phylogeny, and endosymbiosis all become natural consequences of the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$ and the fractal hierarchy of biological polises. No free parameters are added; the same equations that describe a chemical reaction or a philosophical system also describe the deepest structures of life.

Zenodo references (pending)

- Main treatise: [Zenodo DOI pending]
- POLIS Bible: [Zenodo DOI pending]

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