

The Ontology of Continuation

Growth Fronts, Closure Points, and the Stabilizing Role of Atomic Hydrogen

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Abstract

This paper develops a structural account of development as the persistence of an unresolved remainder. A structure is said to develop only insofar as it sustains a locus of continuation—a *growth front*—through which further extension remains possible. When all relevant degrees of freedom are internally compensated, development is suspended and the structure enters a regime of local closure. Unity, on this view, is not a static property of objects but a regime that must be maintained.

The analysis traces this distinction across domains, from botanical growth (buds, branching, leaves) to atomic organization (electron shells and chemical reactivity). *Closure points* are identified as locally complete configurations that suppress continuation at a given descriptive level without conferring absolute stability. The presence or absence of continuation is operationalized through the notion of an *odd remainder*, defined as a minimal non-compensable degree of freedom. Odd remainders function as operators on structure, distinguishing regimes that demand continuation from those that admit closure.

Within this framework, heavy atoms are interpreted as cases of regime loss rather than of progressive completion: beyond a certain complexity, unity is maintained only metastably through the suppression of simplifying transformations. Atomic hydrogen and helium emerge as complementary limiting cases. Hydrogen exemplifies processual unity, remaining intrinsically unclosed and thereby stabilizing extended, reconfigurable structures. Helium exemplifies configurational unity, achieving stability through local closure and structural silence. Organic chemistry, understood structurally, depends on the former regime: stability without finality.

The aim of the paper is methodological and ontological rather than predictive. No new physical mechanisms are proposed. Instead, the analysis offers criteria for distinguishing structural principles from descriptive artifacts by tracking regime transitions between continuation, closure, and metastability across domains, without invoking unobservable absolutes or domain-specific imagery.

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1 Introduction

The question addressed in this paper is not how structures are composed, but how they persist as unified objects while undergoing change. Across domains as different as biological growth, atomic organization, and chemical interaction, objects exhibit a tension between development and stability, openness and closure. The central claim of this paper is that unity is not a static property of objects but a regime that must be sustained. Such a regime exists in one of two forms: either through the maintenance of an active locus of continuation, or through the achievement of a locally closed configuration that suppresses further development.

This claim shifts the focus from form and composition to regime and transition. A structure develops not because it accumulates elements or increases in complexity, but because it preserves an unresolved remainder that prevents internal completion. When this remainder is eliminated—through pairing, compensation, or closure—the structure may remain stable, but it ceases to develop. Growth, in this sense, is not the opposite of stability; it is a mode of stability sustained by openness.

The analysis proceeds by tracing this distinction across multiple domains. In biological systems, development is organized around growth fronts, while completed structures persist as stabilized traces of prior activity. In atomic systems, electron shells function as local closure mechanisms that suppress further internal adjustment without conferring absolute completion. In heavy atoms, the accumulation of resolved structure undermines coherence, leading to the loss of a unified regime of existence. In chemistry, atomic hydrogen and helium exemplify two limiting modes of unity: the former sustaining openness through an irreducible remainder, the latter achieving stability through configurational closure.

Importantly, the present work does not propose a new physical theory, nor does it seek to revise established empirical results. Its aim is structural and ontological rather than predictive. Concepts such as growth fronts, unresolved remainders, and closure points are introduced not as physical entities, but as operators that distinguish regimes of continuation from regimes of stasis. The analysis does not depend on geometric representations, hidden variables, or unobservable absolutes. Instead, it restricts itself to regime transitions that can be identified through their structural consequences.

By articulating a minimal set of distinctions—between openness and closure, continuation and completion, development and retention—the paper offers a unified framework for understanding how objects persist, transform, and eventually relinquish their mode of existence. The goal is not to reduce diverse phenomena to a single model, but to show that the same structural logic governs the maintenance and loss of unity across scales. In this sense, the work serves as a structural introduction to a broader ontology of unfinished systems.

Contributions.

- A structural definition of *growth fronts* and *closure points* as regime markers distinguishing continuation from suspension of development.
- The introduction of the *odd remainder* as an operator: a minimal non-compensable degree of freedom whose persistence is sufficient for developmental openness.
- A relation-first account of electron shells as mechanisms of local closure, and of heavy atoms

as cases of regime loss characterized by metastable retention rather than regular openness.

- A two-regime ontology of unity, exemplified by atomic hydrogen (processual openness) and helium (configurational closure), identifying hydrogen as the minimal stabilizer of unfinished, reconfigurable structures.

2 Core Definitions: Growth Fronts and Closure Points

The analysis developed in this paper relies on a small set of structural distinctions. These distinctions are not intended as descriptive metaphors, but as regime markers that determine whether a structure admits continuation or enforces closure at a given level of description. The following definitions fix the meaning of these terms as they are used throughout the text.

2.1 Growth Front

A *growth front* is defined as the minimal locus through which continuation of a structure is determined at a chosen descriptive level. It is not an endpoint in the terminal sense, nor a boundary imposed from outside, but an internal structural condition that separates what has already been stabilized from what remains open to further development.

The presence of a growth front indicates that the structure cannot fully compensate its internal degrees of freedom. As long as such a locus persists, the structure retains an orientation toward continuation: it can integrate perturbations by extending itself rather than by collapsing into closure. Growth, in this sense, is not the accumulation of parts, but the maintenance of an unresolved boundary between formed structure and open possibility.

A growth front is therefore singular in orientation even when its manifestations are plural. Multiple local zones of activity may exist, but they are coordinated by a common regime of continuation that preserves the unity of the structure through time.

2.2 Closure Point

A *closure point* is a locally complete configuration that suppresses continuation at a given descriptive level. Closure occurs when all degrees of freedom relevant at that level are internally compensated, leaving no unresolved remainder that would demand further structural extension.

Importantly, closure is never absolute. A closure point does not terminate the existence of a structure, nor does it guarantee final stability across all levels. Rather, it marks a suspension of development within a specific regime of description. Beyond that regime, transformation, reorganization, or loss of unity may still occur.

Closure points stabilize structures by eliminating the need for further internal adjustment. In doing so, they enable persistence without development. This distinction between persistence and continuation is central to the analysis that follows.

2.3 Odd Remainder Heuristic

The distinction between growth fronts and closure points can be made operational through the notion of an *odd remainder*. An odd remainder is not a numerical property, but a structural one. It is defined as the minimal non-compensable degree of freedom within a configuration—an element or capacity that lacks an internal compensator at the given level of description.

So long as an odd remainder persists, the structure cannot close upon itself. Its presence is sufficient to sustain a growth front and therefore to preserve developmental openness. Conversely, the elimination of all such remainders results in local closure and the suppression of continuation.

In this sense, oddness functions as an operator on structure. It distinguishes regimes that demand continuation from those that admit closure, independently of the material domain in which the structure is realized. What appears as numerical parity in particular cases is merely an empirical manifestation of this deeper structural distinction between unresolved remainder and complete internal compensation.

3 Trees: Buds, Branching, Leaves

A tree provides a paradigmatic example of a structure whose unity cannot be reduced to a mere aggregation of parts. Its development begins from a single initiating bud, which establishes not only a point of origin but a regime of continuation: a privileged locus through which the structure extends itself in time. This initiating act is not a geometric fact but a structural one, defining the tree as a process rather than as a static object.

As growth proceeds, branching produces multiple local zones of activity. Superficially, this multiplicity may appear to undermine the idea of a single, unified structure. However, branching does not generate multiple trees; it generates differentiated expressions of a single developmental regime. The crucial distinction is between *local growth zones* and the *regime of unity* that coordinates them. A tree remains one object not because it has only one growing part at every moment, but because its growth is governed by a coherent continuation that preserves its identity through time.

Leaves play a revealing role in this structure. They are not agents of growth but records of it. Each leaf marks a completed act of extension, a trace of where the growth front has already passed. In this sense, leaves belong to the past of the tree: they are products of growth, not its drivers. Their number, arrangement, or symmetry may vary widely, but none of these properties determines whether the structure continues to develop. What matters is not the accumulation of leaves, but the persistence of an active front where continuation remains possible.

This distinction clarifies why multiplicity alone does not constitute development. A tree can possess an abundance of leaves and yet cease to grow; conversely, it may remain structurally unfinished even when its visible form appears balanced or complete. Development persists only so long as the structure retains a locus of unresolved continuation. When such a locus disappears—when growth collapses into mere maintenance or repetition—the tree may remain an object, but it ceases to be a developing one.

The unity of the tree, therefore, is not secured by symmetry, completeness, or numerical balance,

but by the maintenance of an unfinished condition. The active growth front is what prevents the structure from closing upon itself. Branches and leaves may multiply, but they do so behind the front, as stabilized outcomes of earlier acts. Growth itself is always singular in orientation, even when its manifestations are plural.

In this sense, a tree exemplifies a general structural principle: an object develops only insofar as it remains unfinished. Its identity is preserved not by closure, but by the controlled deferral of closure. The visible complexity of the tree—its branches, leaves, and apparent symmetries—is secondary to this more fundamental fact. What sustains development is not what has been formed, but what has not yet been resolved.

4 Odd Remainders and Structural Continuation

The distinction introduced above between traces of completed growth and loci of continuation allows a precise formulation of the role played by oddness in developing structures. Oddness is not a numerical curiosity, nor a property of counting per se. It is a structural marker indicating the presence of an unresolved remainder within a configuration. Wherever such a remainder persists, closure is deferred and continuation remains possible.

In what follows, an *odd remainder* is understood not as a numerical property, but as a structural one. A remainder is defined as the minimal irreducible degree of freedom that lacks an internal compensator within the given configuration. So long as such a remainder persists, the structure cannot close upon itself and therefore retains a locus of continuation.

Formally, the presence of an odd remainder functions as an operator on structure: it distinguishes configurations that demand continuation from those that admit closure.

In a fully closed structure, all degrees of freedom are locally compensated. No element remains that demands further interaction in order to stabilize the whole. Such closure is typically associated with even, pairwise-complete configurations, in which every component finds an internal counterpart. By contrast, an odd configuration necessarily retains an element that cannot be locally cancelled. This uncanceled element does not constitute a defect; rather, it functions as a demand for continuation beyond the current structure.

This logic is already visible in the botanical example. Leaves accumulate as completed outcomes of growth, but the persistence of development depends on the existence of a single unresolved growth front. Regardless of how many branches or leaves are present, the structure continues only while it is not fully self-compensated. In this sense, the tree remains an odd structure with respect to its developmental state: there is always one more act pending than has been resolved.

Oddness, therefore, should be understood as a relation between completion and continuation, not as a property of static form. A structure may contain many elements and yet remain developmentally odd if its configuration does not allow all tensions to be internally resolved. Conversely, a structure may appear complex while being structurally even, in the sense that no further continuation is demanded by its internal organization.

This interpretation reverses a common intuition. Growth does not proceed by accumulating elements until a threshold is reached; it proceeds by preserving a remainder that resists closure.

Completion, when it occurs, is not the result of having “enough” elements, but of eliminating the remainder that necessitated further development. From this perspective, oddness is not a transient imbalance to be corrected, but the very condition that sustains structural evolution.

The relevance of this principle extends beyond biological examples. In any domain where structures develop—physical, chemical, or abstract—the persistence of an unresolved remainder functions as a criterion of openness. When such remainders are systematically eliminated through internal pairing or symmetry, development halts. What remains is a stable object, but no longer a developing one.

Oddness thus marks the boundary between formation and stasis. It signals that a structure has not yet exhausted its possibilities at the given level of description. Development continues not because the structure lacks elements, but because it lacks closure. As long as this condition holds, the structure retains an active orientation toward continuation, even when its visible form suggests balance or completeness.

5 Shells as Local Closure

The structural role played by leaves in a tree finds a precise analogue in atomic structure when electron shells are interpreted not as geometric forms, but as mechanisms of local closure. An electron shell does not represent a spatial container in which electrons reside; rather, it marks a regime in which a set of degrees of freedom has been locally compensated, thereby suppressing further continuation at a given level of description.

When a shell is closed, the atomic structure ceases to demand additional internal adjustments. No unresolved remainder persists within that regime, and the atom enters a state of structural silence. This silence should not be confused with absolute stability or completeness. It indicates only that, at the level of electronic organization, no internal tension remains that would necessitate further development. In this sense, shell closure functions as a closure point, analogous to the completion of a growth phase in a biological structure.

The empirical sequence commonly associated with such closures—2, 10, 18, 36, 54, 86, 118—is often treated as a purely quantitative feature of atomic physics. Within the present framework, however, these values are significant not because they enumerate states, but because they correspond to moments at which odd remainders are eliminated. At each of these points, all available degrees of freedom at the corresponding level are locally paired and compensated. The structure becomes even with respect to its electronic organization and therefore ceases to require continuation.

5.1 Helium as a Closure Regime: the End of a Branch, Not a Growth Front

The contrast between atomic hydrogen and helium clarifies the difference between continuation and closure at the atomic level. Hydrogen remains structurally open: it sustains an unresolved remainder and therefore preserves a locus of continuation. It can participate in bonding without extinguishing its capacity for further interaction, and it can even transiently acquire an additional electron (forming a fragile negative ion) precisely because its configuration is not internally complete.

Helium exhibits the opposite regime. Its electronic organization is locally closed, and this closure is not merely a quantitative filling but a qualitative shift in mode of existence. The system becomes inert not because it has reached an absolute endpoint, but because it no longer maintains an active locus of continuation at the relevant descriptive level. In this sense, helium is not a growth front but the end of a branch: a configuration in which continuation has collapsed inward and become self-contained.

This yields a compact structural rule. A unified object exists either: (a) by sustaining a privileged locus of continuation (a growth front), or (b) by achieving a locally closed configuration that suppresses such a locus. The first mode is intrinsically processual: it is asymmetric with respect to continuation and remains open to further development. The second mode is configurational: it allows symmetry, tolerates internal compensation, and is characterized by structural silence.

The botanical and atomic cases instantiate the same distinction. In trees, a growth front is externalized as a continuing locus of extension. In hydrogen, openness is carried by an irreducible remainder and therefore by persistent bonding capacity. In helium, the absence of a growth front is not a deficiency but the mark of completion within a local regime. The distinction is not a retreat from the earlier thesis but its strengthening: it shows that the persistence of development requires an unresolved remainder, whereas stable symmetry becomes possible only when development is locally suppressed.

This two-regime view extends naturally to chemistry and beyond. Noble gases exemplify configurational closure; reactive elements exemplify processual openness. Likewise, in biological systems, highly stabilized or “degenerate” forms may persist without developmental continuation. Across domains, the same structural transition recurs: from a regime sustained by an unresolved remainder to a regime stabilized by local closure.

Between these closure points, atomic structures are developmentally open. The presence of an unpaired or uncompensated capacity—an odd remainder—renders the atom reactive, susceptible to interaction, and capable of forming bonds. This openness is not a secondary chemical property but a direct consequence of the absence of closure. Reactivity, in this view, is not an added feature of atoms between noble gas configurations; it is the structural expression of unfinished electronic organization.

Crucially, this interpretation does not rely on the ontologization of orbitals as spatial forms. The distinction between closed and open shells does not presuppose specific geometries, orientations, or shapes. What matters is not how electrons are distributed in space, but whether their collective organization admits a remainder that cannot be internally resolved. Shells, therefore, should be understood as constraints on continuation rather than as containers of particles.

This reading clarifies why closure is always local. Even when an atom exhibits a closed shell, this closure applies only to the electronic regime under consideration. At other levels—energetic, nuclear, or environmental—the structure may still admit or even require transformation. Shell closure does not confer absolute completion; it merely marks a temporary suspension of development within a specific descriptive frame.

In this sense, electron shells perform the same structural function as leaves in a tree. They are outcomes of prior organizational acts, stabilized traces of resolved tensions. Development proceeds

behind them, not through them. What determines whether an atom participates in further structural evolution is not the presence of shells, but the persistence or elimination of an unresolved remainder beyond them.

Shells thus delineate the boundary between development and stasis at the atomic level. They identify where continuation is suppressed, not where the structure is fully determined. As in all developing systems, what matters is not the accumulation of resolved structure, but the fate of what remains unresolved.

6 Loss of Unity in Heavy Atoms

Beyond a certain point, the accumulation of resolved structure no longer enhances stability but undermines it. In heavy atoms, the increase of atomic number does not correspond to a progressive completion of form; rather, it marks a gradual loss of a coherent regime of unity. What fails is not a specific shell or interaction, but the ability of the atom to sustain itself as a single, internally coordinated object.

For the purposes of the present analysis, a regime of unity exists when the internal degrees of freedom of a structure remain coherently coupled, such that perturbations can be absorbed without altering the identity of the object. Unity, in this sense, is not an intrinsic property but a maintained condition.

As atomic number grows, electronic organization becomes increasingly layered and context-dependent. Inner shells act as stabilized residues of earlier closure points, while outer shells extend ever farther from the nucleus and become progressively less rigidly bound. The atom persists as a unified structure only so long as these layers remain coherently coupled. When this coupling weakens, unity becomes conditional and fragile.

The loss of a regime of unity is indicated by a characteristic shift in structural behavior. Among its principal markers are: (i) increasing sensitivity to perturbations that does not scale with structural openness; (ii) the emergence of transformation channels that simplify the structure rather than extend it; (iii) a growing dependence on external conditions for the maintenance of identity; and (iv) the partial decoupling of internal layers previously stabilized by closure mechanisms. These indicators do not signal immediate failure, but a transition in mode of existence.

This fragility should not be confused with immediate decay. A heavy atom may exist for extended periods while remaining structurally compromised. Its apparent stability is often the result of suppressed transformation channels rather than the absence of such channels. From the present perspective, this indicates not completion, but tension: the structure is maintained only by the continual deferral of simplification.

It is therefore crucial to distinguish regular openness from metastability. Regular openness arises from the persistence of an unresolved remainder and supports continuation, interaction, and structural extension. Metastability, by contrast, reflects the weakening of coherence: the structure remains intact only by suppressing, rather than integrating, available transformation channels. Where openness enables development, metastability merely postpones simplification.

Table 1 summarizes the three regimes of unity distinguished throughout the paper as mutually

Table 1: Structural regimes of unity

Regime	Structural condition	Mode of stability	Characteristic behavior
Open (Pro-cessual)	Persistence of an unresolved remainder; presence of an active locus of continuation	Stability through openness and adaptive coupling	Growth, reactivity, structural extension; integration of perturbations
Closed (Configurational)	Local elimination of unresolved remainders; internal compensation complete	Stability through closure and symmetry	Inertness, structural silence; suppression of further continuation
Metastable (Retentive)	Weakening of coherence without resolved openness; partial decoupling of internal layers	Stability through suppression of transformation channels	Sensitivity to perturbations; delayed simplification and eventual reorganization

exclusive modes of structural existence.

On sufficiently large timescales, the loss of unity in heavy atomic structures should be expected to result in a reversion to simpler, more tightly bound regimes. This reversion does not signify failure but reorganization. The atom does not disappear; it relinquishes a mode of existence that can no longer be maintained. What remains are configurations with higher internal coherence and lower structural tension.

In this sense, heavy atoms illustrate a general structural principle: beyond a certain complexity, unity cannot be preserved by accumulation alone. Closure points that once stabilized development become insufficient to hold the structure together. The unresolved remainders that enable growth at lower levels now manifest as sources of instability. What was once a condition of continuation becomes, at greater scale, a liability.

The loss of unity in heavy atoms thus mirrors the cessation of growth in biological structures. Just as a tree ceases to develop when its growth front collapses into mere maintenance, an atom ceases to function as a coherent unit when its organizational tensions exceed the capacity of its closure mechanisms. In both cases, the structure persists, but its mode of existence changes: from development to endurance, and eventually to transformation.

7 Atomic Hydrogen as the Minimal Unclosed Stabilizer

The preceding analysis identifies development with the persistence of an unresolved remainder and stability with locally achieved closure. Within this framework, atomic hydrogen occupies a singular position. It is the minimal structure that cannot attain internal closure without ceasing to be itself. With a single electron and no possibility of internal pairing, atomic hydrogen embodies an irreducible odd remainder.

This irreducibility is not a deficiency but a structural role. Atomic hydrogen cannot silence its own openness through internal reorganization. Any attempt at closure either transforms it into a different object (e.g., molecular hydrogen) or strips it of its atomic identity (e.g., ionization). As an atom, hydrogen exists only as an unfinished structure. Its unity is sustained precisely by the

absence of a mechanism for internal completion.

This property renders atomic hydrogen uniquely capable of stabilizing unfinished structures without enforcing closure upon them. In bonding contexts, hydrogen does not impose a rigid geometric or electronic framework. It neither completes nor dominates the structures it joins. Instead, it mediates interactions while preserving the possibility of further continuation. Bonds involving hydrogen are typically reversible, context-sensitive, and energetically modest—features that reflect hydrogen's own structural openness.

From this perspective, the role of hydrogen in chemistry is not merely frequent but foundational. It enables the coexistence of stability and openness within extended structures. Organic chemistry, in particular, depends on this balance. Carbon provides a versatile framework for connectivity, but without hydrogen such frameworks would either collapse into over-constrained configurations or crystallize into inert forms. Hydrogen prevents premature closure by absorbing, redistributing, and releasing structural tension.

Crucially, no other element can substitute for this role. Elements with closed shells are inert and silent; elements with multiple valence electrons impose strong directional constraints or force rigid completion. Hydrogen alone combines minimal presence with persistent openness. Its single electron does not close a structure, but it allows structures to remain coherent while unfinished.

The stabilizing function of atomic hydrogen thus exemplifies a general principle: the most effective stabilizer of development is not a fully formed component, but a minimal one that resists completion. Hydrogen stabilizes not by closing structures, but by ensuring that closure is never total. In doing so, it sustains a regime in which complex and reconfigurable forms can exist without collapsing into rigidity or dispersing into instability.

Atomic hydrogen, therefore, should not be regarded merely as the simplest element, nor as a primitive building block. It functions as a structural regulator of openness. By embodying an irreducible remainder, it anchors the possibility of continuation across chemical scales. The existence of organic chemistry is not simply contingent upon the presence of hydrogen; it is conditioned by hydrogen's refusal to be complete.

8 Discussion: What Is Structural vs. Descriptive

A natural objection to the preceding analysis is that its cross-domain parallels— between trees, atoms, and chemical systems—are merely metaphorical. From this perspective, references to growth fronts, odd remainders, or closure points might be taken as illustrative language rather than as claims with structural significance. This objection is legitimate, but it rests on an insufficiently precise distinction between metaphor and structure.

A metaphor is descriptive when it decorates an account without constraining it. A structural concept, by contrast, earns its status by tracking invariant regime transitions across domains. In the present context, the relevant transition is the shift between continuation and closure: between configurations that demand further development and those that suppress it. When a concept consistently identifies this transition in systems as different as biological growth and atomic organization, it functions structurally rather than metaphorically.

The criterion, therefore, is not resemblance of imagery but correspondence of regimes. Leaves and electron shells are not equated by visual analogy, nor are buds identified with particles. Instead, both are shown to occupy the same structural position within their respective systems: they mark stabilized outcomes of prior development while excluding themselves from the locus of ongoing continuation. The validity of the analogy depends entirely on whether it preserves this functional role, not on whether the compared entities share physical properties.

Equally important is what the analysis does not introduce. Structural interpretation does not rely on unobservable absolutes, such as absolute rotation, intrinsic orientation, or spatial forms that cannot be operationally distinguished. Where such unobservables are required to sustain an analogy, the analogy collapses into metaphor. By contrast, the present account restricts itself to regime distinctions that are defined internally to each domain and identifiable through their consequences: the presence or absence of further development, reactivity, or transformation.

This restriction sharply separates the present approach from geometric or pictorial interpretations of atomic structure. References to shells, closure, or openness are not claims about hidden spatial arrangements but about the conditions under which a system ceases to require internal adjustment. Whether described in biological, chemical, or physical terms, closure is recognized by the same structural outcome: the suppression of continuation at the relevant level of description.

Accordingly, the parallels drawn in this paper should be read neither as metaphors nor as reductions. They do not assert that trees and atoms are the same kind of thing, nor that one can be explained by the other. Rather, they demonstrate that the same structural logic governs the transition from development to stasis in systems that differ widely in scale and substance. What is shared is not material composition, but the organization of continuation and closure.

In this sense, the analysis advances a minimal but robust claim: a concept becomes structural when it constrains how a system can change. Growth fronts, odd remainders, and closure points are structural precisely because they delimit when development persists and when it halts. Their applicability across domains is not an accident of language, but a consequence of addressing regime transitions that are independent of any particular descriptive vocabulary.

9 Relation to FDB and COE

The present paper is methodologically aligned with the broader framework developed in the Philosophy of Discrete Being (FDB) and Coherent Observational Epistemology (COE) [1, 2], while remaining fully self-contained.

Within FDB, primacy is given not to geometric form or numerical representation, but to the sequential order of events and acts of coherence that establish local regimes of unity. The notion of a *growth front* employed here is compatible with this view: it designates not a spatial endpoint, but a minimal locus through which continuation of a structure is determined at a given descriptive level. Likewise, *closure points* are understood as locally coherent configurations that suppress further continuation without constituting absolute completion.

COE provides the epistemic motivation for the present analysis by emphasizing the need to distinguish between properties of observational languages and properties of the structures being

described. In this light, the present work treats concepts such as shells, closure, and stability not as ontological primitives, but as indicators of regime transitions that emerge from specific modes of description.

Importantly, the arguments advanced here do not rely on nor require acceptance of the full FDB or COE frameworks. Rather, the relation is one of structural compatibility: the analysis of unfinished structures, odd remainders, and stabilization through atomic hydrogen exemplifies, in a concrete physical context, the more general methodological principle that unity is a regime-dependent achievement rather than a given substance.

10 Conclusion

This paper has advanced a structural account of development grounded in a single, cross-domain principle: a structure develops only so long as it preserves an unresolved remainder. Development is not driven by accumulation or complexity as such, but by the maintenance of a locus where continuation remains possible. When this locus is eliminated through local compensation or internal pairing, development halts and the structure enters a regime of closure.

Across the examined domains, closure has been shown to be local rather than absolute. In biological growth, leaves and branches register completed acts while excluding themselves from the active front of continuation. In atomic organization, closed electron shells mark points at which internal adjustment is suppressed without conferring final stability. In heavy atoms, the accumulation of resolved structure ultimately undermines unity, leading to the loss of a coherent regime of existence and a transition toward simpler, more tightly bound configurations. In each case, closure does not signify the completion of the structure as such, but the suspension of development at a specific level of description.

Within this framework, atomic hydrogen and helium emerge as two complementary limiting cases. Atomic hydrogen embodies the processual mode of unity. With no possibility of internal closure, it sustains an irreducible unresolved remainder and therefore maintains an active locus of continuation. Its openness does not destabilize extended structures; on the contrary, it enables them to persist without premature completion. By mediating interactions while preserving the possibility of further transformation, atomic hydrogen stabilizes regimes that remain developmentally open. Organic chemistry, understood structurally rather than descriptively, depends on this mode of unity: it requires coherence without finality.

Helium exemplifies the opposite, configurational mode of unity. Here the unresolved remainder collapses inward and becomes a closed configuration. The active locus of continuation disappears not through failure or degradation, but through local completion. Helium does not grow, react, or extend itself because it no longer requires continuation at the relevant level. In this sense, helium marks the end of a branch rather than a growth front. Its stability is achieved through closure, symmetry, and structural silence.

Taken together, these two cases motivate a general rule. The three regimes of unity distinguished in this analysis—processual openness, configurational closure, and metastable retention—are summarized in Table 1. The table should be read not as a taxonomy of objects, but as a classifi-

cation of modes of existence: mutually exclusive structural regimes through which unity is maintained, suspended, or gradually lost. A unified object exists either by sustaining a privileged locus of continuation, or by achieving a closed configuration that suppresses continuation. The former mode is processual, asymmetric, and developmentally open; the latter is configurational, symmetric, and inert. Both modes are legitimate forms of unity, but only the former admits growth and structural evolution.

The implications of this analysis are methodological rather than predictive. The paper does not propose new physical mechanisms, nor does it revise established empirical results. Instead, it offers a criterion for distinguishing structural principles from descriptive artifacts. Concepts such as growth fronts, unresolved remainders, and closure points are structural insofar as they track regime transitions between continuation and stasis across domains, without invoking unobservable absolutes or domain-specific imagery.

In this light, unity is not a given property of objects but a regime that must be maintained. Stability is not synonymous with completion, and development is not the absence of order but the controlled deferral of closure. Structures endure, evolve, and diversify not because they reach a final form, but because they remain—by necessity or by design—unfinished.

Finally, the structural distinction developed in this paper between processual openness and configurational closure is not limited to physical or chemical systems. It provides a general framework for understanding practices in which the timing of closure is decisive. One such domain is agrarian husbandry, where sustainable outcomes depend not on maximizing growth, but on the timely stabilization, preservation, and closure of developing structures. A forthcoming work will extend the present ontology to this domain, treating husbandry as the practical governance of continuation and closure.

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