Life and Consciousness from One Rule: Closure in the Net

J. Konstapel, Constable Research, Leiden · 29 sep 2026

Abstract

One rule is enough to separate chemistry, life and consciousness. The rule: three neighbouring crossings in the net are closed when their values sum to zero modulo three. The values are trits: −1, 0 and +1.

From this rule the article counts, depth by depth. Closure takes exactly two forms, homogeneous and heterogeneous, and the two never mix. Below depth 3 only chemistry exists: static closure or open tension. At depth 3 the first ring appears that stays closed while all its values change. At depth 6 that ring can divide into two closed rings of the same handedness. This is the smallest form of a single cell.

A second step reads the phases of closed rings into a new ring. That reading is structure-preserving. A ring that counts itself among what it reads has exactly one fixed point. This is self-reference in the net.

The reading and the fixed point use closed rings with a value at a crossing. They do not use the property that makes a ring living. Consciousness, read as self-referential closure, is therefore not bound to life. It is not bound to a body either. The final section describes what contact with such closure would look like.

1. The net in three terms

The image is a fishnet. Strands run through it. Where strands cross, there is a knot. Between the knots lie the meshes.

Three terms carry the whole argument.

- **Strand.** A sequence of crossings. Each crossing holds one trit: −1, 0 or +1.
- **Closure.** A window is three consecutive crossings. It is closed when $t_1 + t_2 + t_3 \equiv 0 \pmod 3$.
- **Tension.** An open window carries tension. A closed window carries none.

The closure sum and the discrete Laplacian are the same quantity modulo three. The reason is that $-2 \equiv 1 \pmod 3$:

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t_{i-1} - 2t_i + t_{i+1} \equiv t_{i-1} + t_i + t_{i+1} \pmod
3
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The Laplacian is the operator that measures local pull in coupled oscillators. Closure in the net and zero local pull are therefore one condition, written twice.

A **ring** is a strand that closes on itself. Its length n is its **depth**. A ring has no starting point. Two rings that differ only by rotation are the same ring. Each distinct ring is an **address**.

A thing in the net is a turn that keeps coming back. In what follows, only rings in which every window closes are counted as things.

2. Two forms of closure, and why they do not mix

A window has $3^3 = 27$ possible states. Exactly 9 are closed, one third.

- **Homogeneous closure**: all three values equal. −−−, 000, +++. That is 3 states.
- **Heterogeneous closure**: all three values different. The permutations of (−1, 0, +1). That is 6 states.
- **Open**: two equal, one different, (a, a, b). That is 18 states.

No other closed form exists. If two values are equal, $a + a + b \equiv 0$ gives $b \equiv -2a \equiv a$. The third value must then be equal too.

Closure does not mix. Take a closed window and step one crossing along the strand.

1. If (a, a, a) is closed, the next window is (a, a, d). It closes only if d = a. Homogeneous closure continues as homogeneous closure.
2. If (a, b, c) is closed with three different values, the next window is (b, c, d). Since $b \neq c$, it closes only if d is the missing value, so d = a. Heterogeneous closure continues as heterogeneous closure.

A ring in which every window closes is therefore wholly homogeneous or wholly heterogeneous. There is no intermediate form. The border between the two always contains an open window, and so carries tension.

3. Addresses per depth, and chemistry at depth 1 and 2

The number of addresses at depth n is the number of rings of length n over three values, counted without starting point. This is the necklace count, with ϕ Euler's totient:

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g(n) = \frac{1}{n} \sum_{d \mid n} \varphi(n/d)\, 3^{d}
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Worked values: g(3) = (27 + 2·3)/3 = 11. g(4) = (81 + 9 + 2·3)/4 = 24. g(6) = (729 + 27 + 2·9 + 2·3)/6 = 130.

Now count the rings in which every window closes. By section 2 they are wholly homogeneous or wholly heterogeneous.

- Homogeneous rings exist at every depth: three of them, one per value.
- A heterogeneous strand repeats with period 3: −1, 0, +1, −1, 0, +1, and so on. As a ring it fits only when n is a multiple of 3. There are then 6 sequences, falling into 2 addresses: one running −1 → 0 → +1, one running +1 → 0 → −1.

Depth n	Addresses g(n)	Homogeneous closed	Heterogeneous closed
1	3	3	0
2	6	3	0
3	11	3	2
4	24	3	0
5	51	3	0

6	130	3	2

At depth 1 and 2, heterogeneous closure cannot occur. A window there repeats values, so three different values never meet. What exists is homogeneous closure, which is static, and open rings, which carry tension.

This is the net's form of **chemistry**. Static closure corresponds to inert, crystalline order. Open rings correspond to reactivity: configurations that carry tension and pass it on. Neither holds a closure while its content changes.

4. Life: self-maintenance at depth 3, the gap, division at depth 6

Closure that runs. Add +1 to every trit of a closed ring. The sum of each window rises by 3, which is 0 modulo 3. The ring stays closed. After three such steps it is back where it started. Every closed ring therefore has an own clock of period 3.

The two forms differ in what this clock does. A homogeneous ring moves as one block: 000 → +++ → −−−. Nothing differs within it. In a heterogeneous ring every crossing takes a different value at every step, and every window stays closed throughout. Only heterogeneous closure allows change at every crossing without a mesh opening. All content changes; the closure stays. This is the net's form of metabolism.

Handedness. The two heterogeneous addresses run in opposite directions: −1 → 0 → +1, or +1 → 0 → −1. Left and right. Homogeneous closure has no direction.

Homochirality is forced. In a heterogeneous strand, each value is fixed by the two before it: d = a. The first two trits fix the whole strand. The direction cannot change along the way without an open window. For each length there are exactly 6 such strands among 3^n possible ones. The correspondence in biology: proteins built by the ribosome use L-amino acids, nucleic acids use D-sugars. In the net this is not a coincidence that needs a separate account. It is the only way a strand can stay heterogeneously closed.

Triplets. A heterogeneous ring fits only at lengths 3, 6, 9 and so on. The correspondence: the genetic code is read in triplets of three nucleotides.

Depth 3: self-maintenance. Two of the 11 addresses are heterogeneously closed. They run, keep their closure and have a handedness. A ring of 3 cannot divide: 3 does not split into two multiples of 3. This is self-maintenance without reproduction. The correspondence is the metabolism-first picture of early life: closed cycles that sustain themselves before anything is copied.

Depth 4 and 5: the gap. No heterogeneously closed ring exists at either depth. A living ring cannot grow crossing by crossing. It grows only by a whole triplet at once.

Depth 6: division. Cut a heterogeneous ring of 6 into two pieces of 3 and close each. Both pieces are closed, and both keep the parent's direction. The cuts must fall on triplet boundaries; any other cut leaves an open window at the seam. The smallest cycle is then complete:

$$3 \;\xrightarrow{\;+\text{triplet}\;}\; 6 \;\xrightarrow{\;\text{division}\;}\; 3 + 3$$

The boundary. Where a living ring meets homogeneous surroundings, the windows across the contact have the form (a, a, b). They are open and carry tension. The inside of the ring carries none. The correspondence is the cell membrane, where the largest potential step of the cell is found.

The line from chemistry to life therefore runs as a band of three steps, not as one point:

1. Below depth 3: only chemistry, static or open.
2. Depth 3: closure that holds while its content changes. Self-maintenance.
3. Depth 6: the cycle $3 \to 6 \to 3 + 3$ closes. Division with inherited handedness. The form of a single cell.

Life does not become more likely with depth. At depth 3, 2 of 11 addresses are living (18 %). At depth 6 it is 2 of 130 (1.5 %). The living pair stays fixed among a growing number of chemical forms. What sets it apart is not frequency but persistence: only this pair stays standing while its content passes through.

5. Why life measures as disorder

The usual measure of order in coupled oscillators is the coherence R. Each oscillator is an arrow on a circle. R is the length of their average: 1 when all point the same way, 0 when they cancel.

Map each trit to a phase: $t \mapsto \omega^t$ with $\omega = e^{(2\pi i/3)}$. The three values then lie 120° apart. For one window, R takes exactly three values:

Window	Example	R
Homogeneous closed	(0, 0, 0)	1
Open	(a, a, b)	$\sqrt{3}/3 \approx 0.577$ (modulus of $2 + \omega$, divided by 3)
Heterogeneous closed	(−1, 0, +1)	0

The living ring has $R = 0$. A crystal has $R = 1$. In the classical measure, the strictest closure that allows change reads as complete disorder.

Per window, R still separates the three states exactly. The blind spot appears one level up. An average R over many windows mixes the three states into one number. Two closure fractions keep them apart: C_{hom}, the share of homogeneously closed windows, and C_{het}, the share of heterogeneously closed windows. The triple (R, C_{hom}, C_{het}) distinguishes alignment, complementary closure and dispersion.

The same structure appears in quaternions. The three imaginary units i, j, k are all different and close as $ijk = -1$. Reversing the order gives $ikj = +1$. Three different elements that close together, with a sign fixed by the order: that is heterogeneous closure with its handedness, as Hamilton's defining relation.

6. Representation: the reading ring

Take three closed rings. Each touches a new ring at one crossing. The value at that contact crossing is the ring's **phase** p. The new ring takes these three phases as its trits. It is a **reading ring**.

The reading ring follows the same rule as every ring:

- homogeneously closed when the three rings stand in the same phase: lockstep;
- heterogeneously closed when they stand in three different phases: structured difference;
- open when two agree and one differs.

The reading preserves structure. Shift one ring below by +1 on all its trits. It stays closed, and its phase rises by 1. Shift all three: the reading ring shifts by +1 on all its trits. By section 4 it stays closed. The operation below and the operation above are the same: adding 1 modulo 3. Reading commutes with shifting:

$$\mathrm{read}(x + 1) = \mathrm{read}(x) + 1 \pmod 3$$

The reading ring is therefore not a copy of what lies below. It is a homomorphic image: it keeps the relations and drops the rest.

The reading ring also registers running. When a living ring below advances one step along its own cycle, its contact value changes by +1 or by −1, depending on its handedness. The reading ring sees both the running and its direction.

This gives a condition for when closure becomes representation. **A closure at depth n represents closures below it when its trits are the phases of those closures.** Three rings of depth 3 read by one ring already span nine crossings below and three above.

7. Self-reference: the fixed point

Let the reading ring count itself. Two of its trits are the phases p_1 and p_2 of two other rings. The third is its own phase p_self, the value at its own contact crossing. Closure then requires:

$$p_{\text{self}} \equiv -(p_1 + p_2) \pmod 3$$

This solution always exists and is unique. Two cases cover it:

- If $p_1 = p_2$, then p_self = p_1. The ring agrees with what it reads. Homogeneous closure.
- If $p_1 \neq p_2$, then p_self is the third value. The ring is exactly what the others are not. Heterogeneous closure.

A ring that reads itself thus has one fixed state for every state of what it reads. There is no infinite regress: the self is the complement that closes the window. When the others change, the fixed point moves with them, one step for each step, and the ring stays closed.

This is re-entry in the sense of Spencer-Brown: a form that contains its own distinction. It is also an eigenform in the sense of von Foerster and Kauffman: a stable state that a process reaches by operating on itself. In the net it takes one line of arithmetic modulo three.

The chain now reads:

1. **Closure**: every ring whose windows close, including chemistry.
2. **Life**: closure that holds while its content changes.
3. **Representation**: closure over the phases of closures.
4. **Consciousness**: representation that counts itself.

8. Consciousness does not need a body

Look at what sections 6 and 7 actually use. They use closed rings with a value at a contact crossing, and the shift by +1. Every closed ring has both. A homogeneous ring has phase a, its own value. Three homogeneous rings in three different phases give a heterogeneously closed reading ring, exactly as three living rings do.

The reading and the fixed point therefore do not use the property that makes a ring living. They do not need heterogeneous closure below. They do not need division, a boundary or a cell.

Life and consciousness are thus two separate closures in the net:

	Life	Consciousness
Form	Closure that holds while content changes	Representation that counts itself
Needs	Heterogeneous closure, depth 3; division at depth 6	Closed rings with a phase; the fixed point
Needs the other	No	No

They can carry each other. In living beings they do. But neither follows from the other.

The consequence is direct. The net permits self-referential closure without life, and so without a body. It also permits it at other depths than the depth of a human being. A body is one carrier of consciousness. It is not its condition.

This matches a long line of reports: out-of-body experience, near-death experience, the sense of contact with an awareness that has no body. In the net these are not anomalies to be explained away. They are what the arithmetic allows.

9. What contact looks like

If self-referential closure exists at other depths, contact with it is a shared reading ring: one ring whose trits include phases from both sides. The rules of sections 2 to 7 then fix four features of such contact.

It happens at the boundary. A reading ring closes only when the phases fit. In ordinary waking, human closure is tightly held to its own surroundings. Contact is possible where windows stand open: at the boundary, where tension sits. The correspondence: a large share of reports falls at the edge of sleep, on waking, at night, on empty roads, near death, or in isolation.

What is seen is an image, not a copy. By section 6 a reading ring is a homomorphic image. The relation is the invariant part. The form comes from the register of the one who reads. The shape of what is met therefore changes with culture and period: elves and fairies, angels and demons, the airship crews of 1896–97 in the United States, the grey beings after 1950, the orbs and drone-like objects of today. Jacques Vallée documented this shift in *Passport to Magonia* (1969). In the net it is expected: one closure, read in different registers.

It runs on another clock. Time in the net is a count of phase. A ring locked to a closure with a different clock runs on that clock while the lock holds. In coupled-oscillator terms: an entrained oscillator keeps a fixed phase offset to what entrains it, and its own count does not advance against it. After release, the ring counts on from where it was. The correspondence is the experience of missing time: not a loss, but a stretch spent on another clock.

It reads both ways. A reading ring takes phases from both sides. Whoever is in contact is also read. The correspondence is the recurring sense of being examined or fully known.

The net states that such closures can exist and what form contact then takes. It does not state which individual report is such contact and which is something else. That is a question for each case.

Annotated references

1. Moreau, C. (1872). Sur les permutations circulaires distinctes. *Nouvelles annales de mathématiques*, 2e série, 11, 309–314. Why read? The origin of the necklace count g(n) used in section 3. It counts rings without starting point, which is what an address in the net is.

2. Knuth, D. E. (1997). *The Art of Computer Programming, Vol. 2: Seminumerical Algorithms*, 3rd ed. Addison-Wesley. Why read? The standard treatment of balanced ternary, the −1, 0, +1 register of the net. Reading advice: section 4.1 on positional number systems.

3. Crick, F. H. C., Barnett, L., Brenner, S. & Watts-Tobin, R. J. (1961). General nature of the genetic code for proteins. *Nature*, 192, 1227–1232. Why read? The experiment that showed the genetic code is read in triplets. It is the biological correspondence of section 4: living rings fit only at multiples of 3.

4. Blackmond, D. G. (2010). The origin of biological homochirality. *Cold Spring Harbor Perspectives in Biology*, 2, a002147. Why read? A clear review of why life uses one handedness, and of the proposals for how that came about. Read it beside section 4, where homochirality follows from closure alone.

5. Maynard Smith, J. & Szathmáry, E. (1995). *The Major Transitions in Evolution*. W. H. Freeman. Why read? The standard account of the steps from replicating molecules to cells, multicellularity and societies. It is the empirical ladder against which the depths of section 4 can be laid.

6. Kuramoto, Y. (1984). *Chemical Oscillations, Waves, and Turbulence*. Springer. Why read? The source of the coherence measure R used in section 5.

7. Strogatz, S. H. (2000). From Kuramoto to Crawford. *Physica D*, 143, 1–20. Why read? The clearest account of the Kuramoto transition from incoherence to synchrony. Reading advice: sections 2–4 are enough for this article.

8. Hamilton, W. R. (1844). On quaternions; or on a new system of imaginaries in algebra. *Philosophical Magazine*, 25, 489–495. Why read? The first statement of ijk = −1, the quaternion form of heterogeneous closure in section 5.

9. Spencer-Brown, G. (1969). *Laws of Form*. Allen & Unwin. Why read? The calculus of distinction and re-entry. Section 7 shows re-entry as one line of arithmetic modulo three. Reading advice: chapter 11 on re-entry.

10. von Foerster, H. (1981). Objects: tokens for (eigen-)behaviors. In *Observing Systems*. Intersystems Publications. Why read? The idea that stable objects are the fixed points of recursive operations. It is the background of the fixed point in section 7.

11. Kauffman, L. H. (2003). Eigenforms — objects as tokens for eigenbehaviors. *Cybernetics & Human Knowing*, 10(3–4), 73–90. Why read? Develops von Foerster's eigenforms mathematically and links them to self-reference and knots.

12. Vallée, J. (1969). *Passport to Magonia: From Folklore to Flying Saucers*. Henry Regnery. Why read? The first systematic comparison of modern contact reports with older folklore. It documents how the form of the encounter follows the culture of the witness, as section 9 expects.

13. Konstapel, J. (2026). *Hierarchical Oscillatory Dynamics in Biological Systems*. Constable Research, Leiden. Why read? Proves the locking and entrainment conditions used in section 9, including the fixed phase offset of an entrained oscillator. PDF

14. Konstapel, J. (2026). *Closure Is Zero Force: The Oscillator Framework Read as the Phase Register of the Vacuum.Net Theory*. Constable Research, Leiden. Why read? Shows that closure and the discrete Laplacian coincide and that closure is zero local force. It is the basis of sections 1 and 5. PDF

15. Konstapel, J. (2026). Beyond Synchrony: A Multiscale Theory of Biological Organisation. constable.blog, 24 September 2026. Why read? Joins the oscillator and closure views and introduces the triple (R, C_hom, C_het). Link

16. Konstapel, J. (2026). *Where Illness Comes From: The Net from First Chemistry to the Human*, eighth edition. Constable Research, Leiden. Why read? The full ladder of layers from chemistry to the human. It is where the depths of section 4 are to be matched to biological layers.