

The Emergence of Meaning from Encounter

A Generative Relational Theory of Serendipity

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Abstract

Serendipity is ordinarily analysed as the sum of two independent quantities, a contingent event and a prepared mind, following Walpole's pairing of accident with sagacity. Three developed traditions refine that analysis. The first locates the decisive factor in the observer, treating preparation as a cognitive property that some individuals possess in higher degree. The second locates it in the object or in the order that placed the object there, which is the form the question takes under doctrines of providence and under strong determinism. The third, in recent philosophy of science, locates it in the scientific community and in the retrospective recognition of value. This paper develops a fourth account. An encounter is a relation between a configured cognition and a contingent phenomenon, and the meaning that arises in a serendipitous event is generated at that relation, with neither relatum holding it in advance. Sagacity is accordingly reconstructed as the capacity to hold a relation unresolved for the interval required for an unforeseen phenomenon to couple to it, a capacity of sustained non-closure whose failure mode is early termination in a settled response. The encounter that terminates in an appreciative judgement is examined as the limiting case in which contingency arrives and generation does not follow. The account is extended to the structure of inquiry: disciplines are treated as relational crystallizations whose local coherence is productive, and whose foreclosure of encounter begins where local coherence is taken for independence. Cases are developed in physics, cosmology, intelligence analysis, economic interpretation, international practice, and cross-domain transfer, together with a survey of the existential, religious, and philosophy-of-science literatures on contingency.

Keywords: serendipity; contingency; encounter; meaning; relational ontology; preparation; interdisciplinarity; generative relational being.

A note on the standing of this paper. This is a preliminary discussion. It occupies the position between an ontology and a governance programme: if being is generative and relational, the epistemology that follows must say how meaning arrives, and serendipity is the case in which the arrival is most visible because nothing in the encounter was arranged in advance. The order of exposition follows the order of the argument. The existing accounts are set out first, across three literatures that have rarely been read together, and the relational account is introduced at the point where their common commitment becomes visible. Should the phenomenon prove fully described by preparation on the observer's side, the central sections lose their ground. The cases are constructed for illustration and drawn from the published record; they carry the weight of illustration. Objection, correction, and counter-evidence are welcome at huangwanhong@serendip.ngo.

1 INTRODUCTION

Two people stand before the same crystal. The first looks, finds it beautiful, and moves on. The second looks, and something opens: local rules of growth have produced a structure that is ordered throughout and uniform nowhere, whose grains meet at boundaries that hold difference in place while the whole retains its integrity. Within the hour this second observer is thinking about languages in a shared political order, and about whether a plurality of coherent worlds can be held together by the relations between them. The crystal was the same crystal. It sat in the same case, under the same light, for the same interval. Whatever happened, happened between the mineral and one of the two people looking at it.

The ordinary vocabulary for this is luck, and the ordinary refinement of that vocabulary is that luck favours the prepared. Pasteur's formula from the Lille address of 1854 has become the settled wisdom of the sciences: in the field of observation, chance favours the prepared mind. Horace Walpole's coinage a century earlier had the same two-part shape. Writing to Horace Mann in January 1754, he named after the heroes of a Persian tale a faculty for making discoveries by accidents and sagacity, of things one was not in quest of. The pairing has proved durable, and it names the two factors correctly. What the pairing leaves open is the relation between them. Accident and sagacity are joined by a conjunction, and a conjunction is the weakest connective available. It states that both were present and says nothing about how the presence of both produced what neither produced alone.

The question this paper takes up concerns that connective. Where does the meaning of a serendipitous encounter arise, and what kind of thing must sagacity be for the encounter to yield anything at all?

Three developed positions answer the question, and they divide by where they place the meaning.

The first places it on the side of the observer. Preparation is a property of a mind, distributed unevenly across individuals, and the serendipitous discovery is the yield of a well-stocked and alert cognition meeting an occasion. Merton's serendipity pattern belongs here in its classical reading: an unanticipated, anomalous, and strategic datum becomes the occasion for extending a theory, and what makes it strategic is the theoretical equipment the observer brought. The position is sound as far as it reaches, and it grounds a large practical literature on how research environments should be arranged. Its difficulty is that it inherits a picture of the object as inert. The datum contributes its anomaly and contributes nothing further; the work is done inside the head that receives it. On this picture the crystal is a stimulus, and the polycrystalline account of plurality was already latent in the second observer, waiting for any sufficient trigger.

The second places the meaning on the side of the object, or on the side of the order that arranged for the object to be there. This is the form the question takes wherever a doctrine

of providence, decree, or comprehensive determination is in force, and §4 treats it at length because the religious traditions have thought about contingency longer and harder than the sciences have. Calvin's treatment in the *Institutes* is the sharpest version available: fortune and chance are terms that leave no place in human affairs once providence is understood, and what appears fortuitous to us is fortuitous only in respect of our ignorance of its cause. Aquinas preserves more, holding that providence extends to contingents in their contingency, so that chance is real relative to particular causes even where it is not real relative to God. The strength of the family is that it takes the meaningfulness of the encounter with full seriousness. Its cost, for the present question, is that meaning arrives at the encounter already complete. What the observer does is find it.

The third position, developed most carefully by Copeland in recent philosophy of science, moves the analysis out of the individual altogether. Serendipity is an emergent property of a discovery process distributed across a community, and its recognition is retrospective: a valuable outcome must be obtained before reflection on its significance can occur. Glăveanu, in the same research programme, presses further toward relation, proposing that the question of what lies inside the prepared mind be replaced by a question about what happens between mind and world. This literature is the nearest to the account developed here, and §3 states the points of contact precisely. The remaining distance concerns time and locus. On the social-epistemological account the meaning is conferred by a community looking back; the encounter itself is an event whose significance is settled elsewhere and later.

Across three literatures that do not read one another, a single commitment recurs. Meaning is taken to have a location. It sits in the observer's equipment, or in the object and the order behind it, or in the community's retrospective judgement, and the analytic task is to identify which. The alternatives are then arranged as a dispute over the address.

The present paper proceeds from a different starting point. Generation occurs between *relata* and is a property of neither. This is the governing commitment of Generative Relational Being, and serendipity is the case that displays it with least interference, because nothing in a serendipitous encounter was arranged to produce the outcome it produced. In the crystal case there is no prior fact about the mineral that contains a theory of multilingual democracy, and no prior state of the observer that contains it either. The second observer carried an unresolved question about how coherent particulars might compose a whole without being flattened into uniformity. The crystal carried a structure in which local rules produce ordered heterogeneity across grain boundaries. Neither was the theory. The theory was generated when the two came into relation, and the relation produced a third thing that was in neither.

From this starting point the two ordinary terms are reconstructed. The contingent phenomenon has a structure of its own that participates in what is generated, which is why the same prepared observer meets a thousand contingencies and generates from a few. And sagacity ceases to be a quantity of intelligence or a stock of expertise. It becomes a temporal capacity:

the capacity to hold a relation open, unresolved, and unclosed for the interval required for an unforeseen phenomenon to couple to it. On this reading the first observer's response to the crystal is the diagnostic case. Nothing was lacking in attention or in feeling. The response was appreciative and closed, and closure is what forecloses generation. Beauty arrived as a terminus. For the second observer, beauty was where the encounter opened.

The account developed from this starting point yields four contributions.

The first is the relational reconstruction of the serendipitous event, which places the emergent meaning at the coupling of a configured cognition and a contingent phenomenon and derives the observed features of serendipity from that placement (§6).

The second is the reconstruction of sagacity as maintained non-closure, together with its failure modes (§7). This is the paper's principal original claim, and it converts a dispositional term into a temporal one. It also carries the practical consequence that the capacity can be cultivated, though the encounter it prepares for cannot be planned.

The third is the treatment of aesthetic closure as the limiting case of the non-encounter (§5), which supplies the negative diagnostic the field has lacked. Existing accounts explain why serendipity occurs. The question of why it fails to occur, in the presence of both a contingent event and an attentive observer, has not been posed in these terms.

The fourth extends the account from the individual encounter to the architecture of inquiry (§8). Disciplines are relational crystallizations, and their local coherence is what makes them productive. The foreclosure of encounter begins where local coherence is taken for ontological independence, at which point the boundary sorts a phenomenon away from a question before the two can meet.

The paper occupies a determinate position in a larger programme. Generative Relational Being supplies an ontology in which relation has priority over relata. A governance extension draws consequences for institutional design. Between them a question stands open: if being is generative and relational, by what route does new meaning enter, and what must a knower do to be available to it. Serendipity is the answer's most legible case, and the account developed here is offered as the epistemological hinge of the programme.

These are pursued under three questions.

- RQ1.** Where does the meaning generated in a serendipitous encounter reside, given that neither the contingent phenomenon nor the observer's prior state contains it?
- RQ2.** What capacity on the observer's side allows an unforeseen phenomenon to couple to a question the observer carries, and what are the conditions under which that capacity lapses?
- RQ3.** What follows for the organization of inquiry, given that boundaries which make local coherence possible also govern which encounters can occur?

The first is treated in §§5–6. The second is the centre of the paper and is treated in §7. The third is treated in §8 and its consequences in §11.

The account may be stated as a single claim.

Central claim. (The two conditions of generation at an encounter) *A serendipitous encounter is a relation between a configured cognition and a contingent phenomenon, and the meaning arising from it is generated at that relation, with neither relatum holding it in advance. Sagacity is the capacity to maintain a relation unresolved for the interval required for an unforeseen phenomenon to couple to it. The encounter that terminates in a settled response is a non-encounter, in which contingency arrives and generation does not follow. The conditions of serendipity are therefore two and jointly necessary: a configuration carrying live and unresolved relations, and an openness across the boundaries that would otherwise sort the phenomenon away from the question before they meet.*

The remainder proceeds as follows. §2 surveys the treatment of contingency in the existential tradition, which has thought about the encounter with brute contingency more thoroughly than any other, and identifies the projection model it bequeaths. §3 surveys serendipity in the study of discovery, from Walpole through Merton to the recent social-epistemological turn, together with the theory-ladenness literature that bears directly on the configuration claim. §4 surveys contingency in religious and theological thought, where the strongest opposition to the account and several of its closest precursors are both located. §5 develops the configuration of the encounter and the case of aesthetic closure. §6 states the generative structure and distinguishes information from meaning. §7 develops sagacity as maintained non-closure. §8 treats disciplinary crystallization and the foreclosure of encounter. §10 develops cases across six domains. §11 draws consequences for the conduct of inquiry, and §12 states the limits of the account and the work it leaves open.

2 CONTINGENCY IN THE EXISTENTIAL TRADITION

The encounter with brute contingency is the founding scene of a whole philosophical tradition, and the tradition arrived at an answer that runs opposite to the one developed here. Setting out that answer with care is the first task, because the projection model it bequeaths is the position most likely to be attributed to this paper by a reader who moves quickly.

2.1 *The Withdrawal of Meaning in Sartre*

Roquentin, in the public garden, looks at the root of a chestnut tree. The words have gone, and with the words the meaning of things has gone; the root is there, entirely raw, and existence discloses itself as the absolute, perfectly gratuitous. Sartre (1964) makes this the paradigm

encounter with *contingence*, and the philosophical apparatus of Sartre (1956) formalizes it: facticity is the perpetual contingency that the for-itself assimilates without founding, and it is altogether contingent that I be, since I am not the foundation of my being.

The structural feature to mark is the direction of the movement. At the encounter with raw contingency, meaning drains out. The in-itself is dense and significance-free; the for-itself confers such significance as there is; and the confrontation with contingency is the moment at which the conferral is exposed as conferral. This is the projection model in its strongest form, and it is the exact inverse of the account developed here. Where Sartre finds nausea at the encounter with the unconceptualized, the present account finds the site at which generation becomes possible.

A tension internal to the scene deserves note, since it has been observed by Sartre's readers and bears on the argument. Roquentin arrives as something other than an unconfigured consciousness meeting a bare object. He is a historian in a specific crisis, having abandoned a biography, carrying a particular set of unresolved questions about existence and justification, standing in a French provincial park in the late 1930s. The encounter is thoroughly configured. What Sartre presents as the confrontation of consciousness with sheer being is itself a relational event with a determinate structure on the observer's side, and the nausea is what that particular configuration generated. On the present account this is unsurprising. A differently configured observer, presented with the same root, generates differently.

2.2 *Disclosure and the Prior Horizon in Heidegger*

Heidegger (1962) holds that beings show up *as* something only within a referential totality already in place. The world is the relational whole in which an entity can be encountered as ready-to-hand, and presence-at-hand is the derivative mode obtained when that whole is suspended. Thrownness, *Geworfenheit*, names our being always already delivered over to such a situation; the later vocabulary of *Ereignis* reworks the same structure, which Sheehan renders as thrown-openness.

This is the closest thing in the existential tradition to the configuration claim, and it should be claimed as an ancestor of it. Preparation, in Heidegger's idiom, is the prior disclosive horizon without which nothing appears as anything. The point of divergence concerns what the horizon does. Heidegger's horizon governs *disclosure*: an entity shows up as what it already is within a world. The claim developed in §6 concerns *generation*: what arises at the encounter was in neither the horizon nor the entity, and the horizon's contribution is to make coupling possible, with the coupling producing a third term. Disclosure and generation are distinct operations, and the difference is the paper's principal debt-and-departure with respect to phenomenology.

2.3 *The Chiasm in Merleau-Ponty*

Merleau-Ponty (1968) develops the most nearly relational position the tradition contains. Meaning arises in the flesh, *la chair*, a primordial reversible tissue in which seer and seen, toucher and touched, are modes of one fabric; the intertwining resists resolution into a relation between two separate terms, and an *écart*, a thickness or divergence, holds the terms apart within their reversibility.

The overlap with the present account is substantial: meaning genuinely between, in neither alone. The divergence is precise and consequential. Merleau-Ponty dissolves the two-term structure into a single reversible flesh, so that the terms are modalities of one tissue. The account here retains two relata that are differently structured and independently describable, a cognition with a determinate configuration and a phenomenon with a determinate structure, and locates generation at their coupling. The distinction matters for the cases. Whether the polycrystal's grain-boundary structure participates in what was generated, or merely occasioned an unfolding on the observer's side, is a question with different answers under the two ontologies, and the cases in §10 are constructed to bear on it.

2.4 *The Absurd as a Relation in Camus*

Camus (1955) supplies the clearest statement in the tradition of the logical form this paper argues for. The absurd is essentially a divorce; it lies in neither of the elements compared; it is born of their confrontation. The absurd is not in the human being and not in the world, but in their presence together, and for the moment it is the only bond uniting them. It is born of the confrontation between the human demand for clarity and the unreasonable silence of the world.

The form is exactly the form of the central claim. A quality resides in neither relatum and arises from the relation between them. Two differences fix the position of the present account against it. Camus theorizes a *negative* relation, a divorce and a tension whose product is a permanent dissonance; the account here theorizes a productive relation whose product is new meaning. And Camus's two relata are fixed and generic, a human demand and a silent world, so that the absurd is invariant across observers. The present account makes the observer's configuration variable, which is what allows two people to stand before one crystal and generate differently.

Camus's rejection of Kierkegaard's leap is instructive on the closure question. The leap, on Camus's reading, is philosophical suicide: a forced resolution that terminates the tension by an act of will. The vocabulary of §7 recovers this: premature closure resolves an open relation and forfeits what the relation might have generated. Camus and this paper agree on the discipline of staying open, and disagree about whether staying open is productive.

2.5 *Contingency as First Philosophy in Kuki*

Kuki (1935) constitutes the most sustained treatment of 偶然性 (*gūzensei*, contingency) in the modern non-Western literature, and it has been largely absent from the discussion in European languages. Kuki defines contingency by the negation of necessity, breaking the identity that necessity requires, and gives it a primary metaphysical position. The move that matters here is his grounding of the category in the contingent encounter: the presence one faces now, which need not have been faced, and whose necessity cannot be recovered.

Two features recommend Kuki's treatment for the present argument. He takes the encounter, and not the isolated contingent fact, as the primitive, which is the same choice made in §6. And he extends the analysis into poetics, treating the beauty of fortuitous rhyme as the chance encounter of sounds, which begins to connect the aesthetics of the contingent to its metaphysics. The relation between Kuki's account and the present one deserves a longer treatment than can be given here; what is taken from it is the licence to treat the encounter itself as the unit of analysis.

2.6 *The Position Inherited from the Tradition*

The existential tradition establishes the encounter with contingency as a philosophical problem of the first order, supplies the vocabulary of thrownness, configuration, and horizon, and in Camus supplies the logical form of a quality residing in a relation. What it bequeaths, in its dominant Sartrean line, is a projection model in which significance flows from consciousness onto a world that has none. The remainder of the paper develops the alternative that the tradition's own resources make available and that the tradition did not take.

3 SERENDIPITY IN THE STUDY OF DISCOVERY

The literature that takes serendipity as its explicit object is younger and more empirical, and it has converged over seventy years on a position considerably closer to the one argued here. Setting out that convergence establishes what the present account inherits and what it adds.

3.1 *The Original Pairing*

Walpole's letter to Mann of 28 January 1754 supplies the term and its two-part structure. The princes of Serendip made discoveries by accidents and sagacity, of things they were not in quest of, and Walpole adds a constraint that has been more often quoted than honoured: no discovery of a thing one was looking for falls under the description. The constraint does real work. It rules out the case in which a prepared observer finds what the preparation was aimed at, which is ordinary competence, and isolates the case in which preparation yields something

the preparation did not target. Any account of sagacity must therefore explain how a configuration can be productive with respect to a phenomenon it was not configured for. The account in §7 is built to meet this constraint.

3.2 *The Prepared Mind and the Serendipity Pattern*

Pasteur's Lille formulation of 1854 fixed the observer-side reading for the sciences, and Merton & Barber (2004), written in the late 1950s and published decades later, gave it its sociological development. The serendipity pattern is the experience of observing an unanticipated, anomalous, and strategic datum which becomes the occasion for developing a new theory or extending an existing one. Merton's three adjectives repay attention. Unanticipated locates the contingency; anomalous locates a property of the datum with respect to a body of expectation, which is a relational property; strategic locates its bearing on theory, which is relational in the same way. Merton's own analysis therefore already places two of the three conditions at the relation, while the explanatory weight continues to rest on the disciplined observer.

Yaqub (2018), working from Merton's archives, supplies the field's most useful taxonomy, distinguishing four types by the relation between search and finding and four mechanisms by the route through which the finding arrives, among them a network-emergent mechanism in which the connection is made across parties. The taxonomy is descriptive and compatible with several ontologies of the encounter; the account here can be read as supplying one.

3.3 *The Relational Turn*

Copeland (2019) moves the analysis decisively away from the individual. Serendipity in science is best understood within the context of the scientific community, and the insight of the individual is insufficient, since discovery processes depend on environmental factors and on the structure of the community. Copeland's positive formulation treats serendipity as an emergent property of the discovery process, describing an oblique relation between the outcome of a process and the intentions that drove it.

Glăveanu (2022) presses the same programme toward relation in terms that come very close to the present thesis: the question of what is inside the prepared mind gives way to a question about what happens between mind and world in moments of creative serendipity, with surprise, curiosity, and wonder expanding the prepared mind into a system of open and dynamic relations between self and other, mind and culture, person and world.

The distance between this literature and the account developed here can be stated in two points. The first concerns *when*. Copeland's serendipity is retrospectively categorized: a valuable outcome must be obtained before reflection on its significance can occur, so that the meaning is conferred by a later community judgement. The account here locates the generation at the encounter, with recognition and validation following as distinct operations. The second

concerns *what is maintained*. Glăveanu's system of relations is synchronic, a description of how a mind is relationally constituted at a moment. The claim in §7 is diachronic: what does the work is the maintenance of a relation in an unresolved state across time, and the activation of that maintained relation by an encounter that could not have been scheduled.

3.4 *Configuration and the Observation Literature*

One line in the philosophy of science bears so directly on the configuration claim that it must be stated before the claim is made. Hanson (1958) argues that observation is theory-laden and that there is more to seeing than meets the eyeball. The canonical illustration has Tycho and Kepler on a hill at dawn with identical retinal images: the geocentric observer sees a mobile sun over a fixed horizon; the heliocentric observer sees a fixed sun and a dipping horizon. Kuhn (1962) supplies the same structure in a bubble chamber, where the student sees confused and broken lines and the physicist sees a record of familiar subnuclear events.

The overlap with the configuration claim is close enough to require explicit handling. Hanson's thesis is an epistemology of perception under theory: what an observer sees is conditioned by the theory the observer holds. The claim developed here is an ontology of generation: what arises at the encounter was held by neither party in advance, and the configuration's role is to make coupling possible. The standard objection to Hanson, that the two astronomers see the same thing and interpret it differently, is a dispute about the perceptual level that the present account can leave open, since generation in the relevant sense occurs downstream of whatever the perceptual verdict turns out to be. What Hanson establishes, and what is taken from him, is that the differential response of two observers to one phenomenon is a serious philosophical datum with a long analysis behind it.

3.5 *Abduction and the Surprising Fact*

Peirce's schema for abduction supplies the inferential correlate of the event under analysis: a surprising fact is observed; if a certain hypothesis were true, the fact would follow as a matter of course; there is therefore reason to suspect the hypothesis. van Andel (1994) glosses Merton's account of serendipity along exactly these lines, as a surprising observation followed by a correct abduction. Surprise, in the schema, is a relational property: a fact is surprising with respect to a body of expectation, and the same fact meets a differently equipped observer without surprising anyone. Abduction thus provides a well-developed logic for the inferential step that follows generation, and it presupposes the configuration that the present account makes explicit.

4 CONTINGENCY IN RELIGIOUS AND THEOLOGICAL THOUGHT

The religious traditions have thought about contingency longer than the philosophical and scientific literatures combined, and they contain both the sharpest opposition to the present account and several of its closest precursors. The section is organized by the position each tradition takes on a single question: whether the meaning that arrives in an unforeseen encounter was placed there in advance.

4.1 *Providence and the Dissolution of Contingency*

The strongest opposing position holds that apparent contingency is contingency only with respect to human ignorance. Calvin (1960) states it without softening: fortune and chance are terms whose meaning ought not to occupy pious minds, and there is no place left in human affairs for fortune and chance. The perspectival move follows immediately: however all things may be ordained by God's plan according to a sure dispensation, for us they are fortuitous. The branch that falls and kills a passing traveller was foreseen and decreed. Applied to serendipity, this yields a complete and internally consistent account in which the encounter is arranged, the meaning is authored in advance, and the observer's sagacity consists in recognition.

The Ash'arite occasionalism of al-Ghazālī (1997) reaches a structurally identical result by a different route. The connection between what is habitually taken for a cause and what is taken for an effect is not necessary; fire does not burn cotton; God is the direct agent of every event, and creation is continuously renewed. Where every event is a direct divine act, chance has no purchase and the question of where meaning arises is settled before it is asked. The interpretive literature divides on how thoroughgoing al-Ghazālī's occasionalism is, with some readings preserving a non-necessitating secondary causality, and the division should be respected in any use made of him.

These positions cannot be met by evidence, since they are consistent with every observation. They can be met by a distinction. Causal determination and meaning-generation are separable operations, and a demonstration that an encounter was caused by a comprehensive agency leaves open where the meaning of that encounter arose for the observer who underwent it. The account developed here concerns the second question and is compatible with a range of answers to the first.

4.2 *Contingency Preserved within Providence*

A middle family preserves genuine contingency alongside comprehensive divine action, and its resources are more useful. Aquinas (1947) holds at *Summa Theologiae* I q.22 a.4 that divine providence imposes no necessity that would destroy contingency, having prepared necessary causes for some things and contingent causes for others; what happens by contingency is what the plan conceives to happen by contingency. The mechanism at q.116 and in *Summa contra*

Gentiles III.74 is the concurrence of causes: chance is real relative to particular causal orders, since independent chains meet and produce effects intended by neither.

That mechanism is worth extracting from its theological setting. Aquinas locates chance *relationally*, at the meeting of orders that do not include one another, which is structurally what the present account does with encounter. Boethius supplies the same structure in the register of consolation, with Fortuna as the appearance under which providence is misread. Maimonides (1904) contributes a claim of a different and more directly useful kind: providence reaches each individual in proportion to intellectual perfection. Whatever its theological standing, the form of the claim is the configuration thesis. What can arrive is graded by what the recipient has become able to receive.

4.3 *Relational and Emergentist Theologies*

Process theology supplies the strongest strictly theological ally. Whitehead (1978) composes reality of actual occasions that prehend their inherited world and reach determination through concrescence, with creativity holding the position of the ultimate. Cobb & Griffin (1976) draw the theological consequence: divine action is persuasive, offering an initial aim that each occasion freely actualizes, and the integration is the occasion's own. Value arises in the self-creative synthesis of relational data. The metaphysical shape is close enough to Generative Relational Being that the affinity should be stated plainly, together with the divergence: the process account embeds generation in a panexperientialist cosmology of occasions, a commitment the present framework does not require.

Buber (1958) is the closest religious-philosophical precursor to a relational ontology of encounter, and the closeness is verbal as well as structural. In the beginning is the relation. All real living is meeting. Spirit resides between I and Thou. The passage that bears on sagacity is the one on how the Thou arrives: it meets me through grace, and is not found by seeking; every means is an obstacle, and only where means have collapsed does the meeting come about. Buber thus states the paradox this paper works on. The encounter cannot be produced by will, and readiness for it can be cultivated. His resolution, that readiness is a discipline of availability, is the resolution adopted in §7 in secular terms.

Marion (2002) supplies the phenomenological development. A saturated phenomenon gives more intuition than the concept can organize and than the intention can foresee; it arrives unforeseeably and reverses the direction of the gaze, constituting its recipient. Gschwandtner (2014) presses the correction that matters here: phenomena appear within a hermeneutic space already opened by a recipient's active reception, so that what appears depends on givenness and on interpretation together. That correction is the present thesis arrived at from within religious phenomenology, and it is offered here as convergent support.

4.4 *Preparation as a Discipline*

Several traditions have developed technologies of preparation, and these bear on the practical side of the argument.

Weil (1951) gives the most exact Western description of maintained openness. Attention consists in holding thought empty, waiting, seeking nothing, and ready to receive in its naked truth the object that is to penetrate it. She distinguishes attention sharply from will, and treats the correction of faults as a work of attention that will cannot perform. The description matches the capacity defined in §7 closely enough that Weil should be regarded as its principal Western precursor. Ignatian discernment, with its examination and its reading of consolation and desolation, supplies the same capacity in the form of a trainable daily practice. Eckhart's *Gelassenheit* and the apophatic literature supply its negative pole, the emptying that precedes reception.

Augustine (1961) furnishes the tradition's paradigm case, and it repays reading as a case, with its doctrinal setting held aside. In a Milan garden in 386, in acute and prolonged crisis, Augustine hears a child's voice next door chanting a phrase from a game, takes it for an instruction, opens Paul at random, and reads two verses that end the crisis. Every element of the structure is present. The stimulus is contingent, ambiguous, and trivial in itself. The configuration is a sustained and unresolved question held under pressure for years. The generation is immediate and total. A differently configured hearer in the same street hears children playing.

4.5 *Non-Closure as a Practice*

The tradition that comes nearest to naming the paper's central claim about sagacity is Zen, and the proximity is close enough to require acknowledgement.

Kōan practice is the deliberate maintenance of an unresolved question. The tradition names the state 大疑 (*daigi*, great doubt), and Hakuin's formula makes its function explicit: beneath great doubt lies great awakening; doubt fully and awaken fully; little doubt yields little awakening, and no doubt yields none. The resolution characteristically arrives through an ordinary contingent event. Xiangyan Zhixian, a scriptural scholar who had made no progress, burned his books and withdrew to sweep a path; a pebble thrown up by the broom struck a stalk of bamboo, and the sound resolved what years of study had not. Lingyun Zhiqin, after decades of search, saw peach blossoms across a valley and reported that from that moment he never doubted again.

The structure is the paper's structure. A relation is held unresolved under sustained pressure; an ordinary contingent phenomenon arrives; generation follows immediately and is not reversible. What Zen supplies beyond the structure is the claim that the maintenance is trainable, that its difficulty is the point, and that premature resolution by the master would destroy

the process. The differences deserve equal statement. The kōan is administered, so the tension is induced by a teacher and not carried by the practitioner's own research question; and the tradition treats what is generated as the disclosure of something always present, which is a latency model and diverges from a generation model at that point.

The same latency qualification applies to two further resources. The Lurianic and Hasidic doctrine of sparks holds that every object contains holy sparks awaiting release by a prepared encounter with the ordinary, which is a powerful image of preparation and an account in which meaning pre-exists in the object. Tathāgatagarbha holds that awakening is intrinsic and uncovered. Both are allies on preparation and diverge on generation, and the distinction should be kept sharp, since a critic will otherwise collapse the present account into a latency model.

4.6 Relational Ontologies of the Encounter

The Buddhist and East Asian traditions supply the deepest ontological precursors.

Pratītyasamutpāda, 緣起 (*engi*, dependent arising), holds that phenomena arise in dependence on conditions and possess no independent self-nature. Nāgārjuna (1995) at *Mūlamadhyamakakārikā* 24:18 identifies dependent arising with emptiness and with dependent designation, yielding a position in which entities exist only relationally. This is the semantic thesis of the present paper stated as a general ontology, and it is the oldest and most rigorous version available. The Huayan development, with the mutual containment of Indra's net and the non-obstruction of phenomenon by phenomenon, extends it to a totality in which each locus is constituted by its relations to all others.

The East Asian term 緣 (*en* in Japanese, *yuan* in Chinese, connection or affinity) lexicalizes the meaningful contingent encounter as a relational category. An encounter that would be described in European languages as chance is described here as a connection: one has 緣 (connection) with a person, a place, or a work. The category is neither necessity nor randomness, and it names precisely the phenomenon this paper analyses. That a major linguistic tradition has a common word for it, and that European languages must reach for a coinage from a Persian fairy tale, is itself worth recording.

The tea ceremony's 一期一会 (*ichigo ichie*, one time, one meeting) supplies the practical doctrine. The formulation runs from Sen no Rikyū through Ii Naosuke's *Chanoyu Ichie Shū*: however often host and guests may meet, one day's gathering cannot be repeated, and both parties must therefore participate with complete sincerity and complete preparation. The ceremony is a technology of preparation for a singular unrepeatable encounter, and its emphasis falls on the shared occasion between people. Ibn 'Arabī's principle that there is no repetition in divine self-disclosure gives the same singularity a metaphysical form, with each moment a distinct theophany and each being the disclosure of a configuration of names occurring once.

4.7 Contingency and Interpretation in Chinese Thought

Two further resources deserve separate statement.

The *Huainanzi* parable of the frontier man whose horse ran away is the classical statement of interpretive non-closure. The horse is lost, and the neighbours condole; it returns with fine horses, and they congratulate; the son is crippled riding one, and they condole; the conscription comes and the crippled son is spared. Each judgement is overturned by what follows, and the refrain asks how one could know that the present appearance is the case. The lesson bears directly on §5: to close at a settled evaluation is to fix a meaning that the relation had not finished generating.

Divination supplies the other. The *Yijing* produces a configuration by a chance procedure and yields meaning only through a prepared interpretive apparatus and a cultivated judgement. Zhu Xi's account, that the text's meaning emerges for each person through the process of divination and cannot be captured by a single commentator, is an explicitly emergentist hermeneutic. The associated concept 幾 (*ji*, the incipient) names the barely-perceptible first stirring of change and the capacity that detects it. Comparable systems appear across cultures, from the Yoruba Ifá corpus to the Latin *sortes*, and Augustine's opening of Paul belongs to the same family. What the family demonstrates is that meaning-from-contingency has been engineered for millennia by combining a randomizing procedure with a prepared interpreter, which is the present account's structure built as a practice.

4.8 Synchronicity and Its Limits

Jung (1973) proposed synchronicity as an acausal connecting principle, the meaningful coincidence of events where something other than the probability of chance is involved, developing the idea in conversation with Pauli and applying it in his foreword to the Wilhelm *I Ching*. The scarab episode is its best-known illustration.

The proposal must be addressed because it is the modern theory of meaningful coincidence and occupies adjacent ground. Two features separate it from the present account. Jung posits an acausal principle in the world that pairs the events, which is a metaphysical addition; and the criterion of a genuine synchronicity, in practice, is the felt meaningfulness of the pairing, which supplies no way of distinguishing the phenomenon from apophenia. The relational account requires no such principle and explains the same data by the structure of the encounter, which recommends it on grounds of economy. Where Jung locates meaningfulness in a correspondence between world and psyche, the present account locates it in what a configured cognition and a contingent phenomenon generate at their coupling.

4.9 *The Position Inherited from the Traditions*

Three results are carried forward. The providential family shows what a fully object-side account looks like and where it must be met, namely at the distinction between causation and meaning-generation. The disciplines of preparation, in Weil, in Ignatian practice, and above all in the Zen literature on great doubt, establish that maintained non-closure is a real, describable, and trainable capacity with a long practical history. And the relational ontologies of the encounter, in Madhyamaka, in Huayan, in 縁 (connection), and in Buber, establish that the priority of relation over relata is a position with substantial development behind it. The remainder of the paper works within that inheritance.

5 THE CONFIGURATION OF THE ENCOUNTER

The surveys establish the terrain. The constructive argument begins with the datum the whole literature agrees on and no account has fully exploited: two observers, one phenomenon, two outcomes.

5.1 *The Two Observers*

Return to the crystal. Two people, one specimen, one interval of attention. The first arrives at an appreciative judgement and departs. The second arrives at a question about how coherent particulars might compose a whole while retaining their difference, and departs with the beginning of an account of plurality in a shared political order.

The explanations available divide as the literatures do. The observer-side explanation says the second observer knew more. This is true and insufficient: the second observer's prior knowledge contained crystallography and contained an interest in political plurality, and contained no connection between them, which is the thing that arrived. The object-side explanation says the crystal contains the structure that was read off it. This is true and insufficient in the same way: the grain-boundary structure is a fact about minerals and contains nothing about languages. The community-side explanation says that what makes the episode a discovery is a later judgement by competent others. This is true about validation and silent about the event.

What is required is an account in which the phenomenon's structure and the observer's configuration both participate and neither suffices. The vocabulary for such an account is available in the framework this paper works within, where generation is a property of relations and relata contribute the terms of a coupling without containing its product.

5.2 *The Concept of Configuration*

The observer's contribution is described here by the term *configuration*: the determinate arrangement of questions, tools, commitments, and unresolved difficulties that a person carries into an encounter. Three features of the term are load-bearing.

Configuration is structured, and its structure matters. A configuration containing crystallography and political plurality without a connection between them differs from one containing either alone, and differs again from one in which the connection is already made. What can be generated depends on which relations are present and which are open.

Configuration operates differently from a stock. A quantity of knowledge, held in a resolved state, is a poor configuration for encounter, since resolved knowledge has no open valence to which a phenomenon can couple. This is the substance of the observation that expertise and receptivity can vary independently, and it is developed in §7.

Configuration is historical and slow. It is constituted by what a person has studied, worked on, failed at, and continued to worry about, over years. It cannot be assumed for an occasion, which is the sense in which serendipity resists planning.

5.3 *The Aesthetic Terminus*

The first observer's response repays close attention, because it is where the standard accounts have least to say and where the present account earns its keep.

Nothing was defective in that response. The observer looked, attended, and was moved. The judgement was accurate: the crystal is beautiful. On any observer-side account the episode is simply a case of insufficient preparation, and on any object-side account it is a case of a signal that failed to find a receiver. Both descriptions miss what is distinctive. The response was *complete*. It arrived at a terminus and rested there, and the resting is the operative fact.

An appreciative judgement is a closure operation. It takes a phenomenon, assigns it to a category, and discharges the encounter. The category is a good one and the assignment is correct, and the discharge is what forecloses. Once the crystal has been classified as beautiful, the encounter has been completed, and a completed encounter generates nothing further. The phenomenon remains available in principle; the relation has been closed.

This is the sense in which the episode is a *non-encounter*. The contingency arrived, the observer was present and attentive, and no relation was sustained long enough for anything to be generated across it. Accident occurred without sagacity in the reconstructed sense, and what was missing was duration, not information.

Claim 1. (Differential generation and the aesthetic terminus) *Two observers meeting one phenomenon generate differently in virtue of their configurations, and the differential is a fact about the relation each forms with the phenomenon. An encounter terminating*

in a settled judgement is a non-encounter: contingency arrives, closure is immediate, and generation does not follow. Closure, and not ignorance, is the general failure condition of serendipity.

The aesthetic case is the limiting instance of a wider family. Any settled response performs the same operation. The phenomenon is filed under an available category, and the filing discharges it. This is what makes the family diagnostically useful: the failure is visible in the speed and finality of the response, and is independent of how much the observer knows.

6 THE GENERATION OF MEANING AT THE RELATION

The account can be brought to a definition, and it is useful to set that definition beside the one the tradition has bequeathed. The two are given here in the order of their standing, the received formulation first.

Definition 1. (Received definition of serendipity) 有准备的心智在偶然性中辨认出了意义。

Serendipity is meaning discerned in contingency by a prepared mind.

This formulation is exact about the two factors and carries the whole weight of the account in one verb. 辨认 (*biànrèn*, to discern or make out) takes an object already present and brings it into view, so that the meaning waits in the contingency and preparation is what permits its retrieval. The definition offered here turns on that verb and on the locus it presupposes.

Definition 2. (Initial definition of serendipity in Generative Relational Being)

Serendipity 是关系生成的偶然性被转化为延续系统生成过程的可能的过程。

The contingency generated by relations is transformed into the possibility of continuing the system's generative process.

Three elements of the definition carry the argument, and each is developed in what follows. The contingency is generated by relations, which places it inside the field and removes the standing of a brute externality arriving from outside. The transformation is generative, which distinguishes it from discernment and from the retrieval of something waiting. And the product is a possibility of continuation, which locates the yield of a serendipitous event in what the system becomes able to generate thereafter, beyond the particular meaning that arrived.

The central claim can now be stated in its own terms and its consequences drawn.

6.1 *The Structure of the Event*

A serendipitous event has three moments and one product. A configured cognition carries a set of relations, some of which are open. A contingent phenomenon arrives, unscheduled with respect to those relations. A coupling occurs in which some structural feature of the phenomenon enters into relation with some open relation in the configuration. What is generated is a third term present in neither.

Each element does real work. The contingency of the arrival distinguishes serendipity from ordinary inquiry, in which the phenomenon is sought. The structure of the phenomenon distinguishes the account from projection, since the crystal's grain boundaries participate in what was generated and a differently structured mineral would have generated differently or not at all. The openness of the relation distinguishes the account from disclosure, since a closed configuration meets the same phenomenon and generates nothing. And the thirdness of the product distinguishes the account from both latency models and retrieval models: the polycrystalline theory of plurality was not stored in the observer, and was not written in the mineral.

Claim 2. (The generated third term) *The meaning generated in a serendipitous encounter arises at the coupling of a configured cognition with a contingent phenomenon and is held in advance by neither. The phenomenon supplies structure; the configuration supplies an open relation to which that structure can couple; the generated meaning is a third term whose content is determined by the pairing and by neither party alone.*

6.2 *Information and Meaning*

The distinction that makes the claim precise is one the information sciences established for their own purposes and left undeveloped philosophically.

Shannon (1948) opens by setting semantics aside: the semantic aspects of communication are irrelevant to the engineering problem. Information in the resulting theory is a measure over a distribution, defined without reference to what anything is about, and the theory's power derives from the exclusion. What follows is a clean statement of what a transmission model can and cannot deliver. A channel conveys a quantity from a sender to a receiver, and the quantity is conserved across the transfer.

Bateson (1972) reintroduces the receiver: information is a difference that makes a difference, which makes it relative to a system for which the difference registers. Luhmann (1995) develops the systems form, in which perturbations become information only where they make a difference for the meaning-processing of a system. Peirce's triadic semiotics supplies the general statement, in which signification requires sign, object, and interpretant together, so that no dyad suffices.

Applied to the encounter, the distinction is exact. The crystal carries information in the engineering sense, and carries the same information for both observers, since the photons reaching two retinas do not differ in any relevant respect. Meaning is what one of the two relations generated. The transmission picture, in which something is sent from phenomenon to observer, describes the information and misdescribes the meaning: nothing about plurality in a political order was transmitted, because nothing about it was present at the source.

Claim 3. (Information conserved, meaning generated) *Information is conserved across transmission and is a property of a signal relative to a distribution. Meaning is generated at a relation and is a property of neither relatum. A phenomenon may therefore carry identical information to two observers and participate in the generation of meaning with one, which is the general form of the two-observer datum.*

6.3 Standing with Respect to the Neighbouring Ontologies

Three positions hold that relata do not precede their relations, and the account's standing with respect to them should be fixed.

Barad (2007) holds that relata emerge through intra-action within a phenomenon and that there are no independent relata, only relata-within-relations. Simondon (2020) holds that relation has the same rank of reality as its terms and that the individual is a phase of being presupposing a preindividual metastable field, with transduction propagating structure from place to place. Deleuze (2000) holds that thought begins in a violent encounter with a sign that compels it, so that truth is sought under a constraint and not by good will.

The overlap is substantial and should be conceded without hedging: the priority of relation over relata, in these authors, is prior art for the ontological thesis. The account here specifies that ontology to a case they do not treat and adds two elements they do not contain. The case is discovery under contingency, with its Walpolean constraint that the finding was not sought. The additions are the temporal reconstruction of sagacity in §7 and the diagnosis of closure in §5. Deleuze's encounter is a sudden imposition by the sign, with the observer's contribution passive; the account here makes the observer's sustained maintenance of an open relation a condition of the coupling, which is a different structure with different practical consequences.

One question these authors press deserves a direct answer. If relata do not precede relations, what is the standing of the configured cognition that §5 treats as an antecedent term? The answer adopted here is that a configuration is itself the sediment of prior encounters and carries no independence beyond that history, while remaining sufficiently stable across the interval of a given encounter to be described as a term of it. The two descriptions operate at different timescales and are compatible.

7 SAGACITY AND THE MAINTENANCE OF UNRESOLVED RELATIONS

The reconstruction of sagacity is the paper's principal claim and the point at which the two-part folk formula is replaced.

7.1 *The Reconstruction*

Sagacity, on the received reading, is a quality of mind: acuity, breadth, alertness, a stocked memory, the capacity to notice. The reading has the merit of matching the exemplars, since the figures in the standard cases were in fact acute and well stocked. Its difficulty is that these qualities are common and serendipity is rare, and that the same person exhibits them continuously while generating from a contingency perhaps a handful of times in a career.

The reconstruction proposed here makes sagacity temporal and specific.

Claim 4. (Sagacity and maintained non-closure) *Sagacity is the capacity to maintain a relation in an unresolved state for the interval required for an unforeseen phenomenon to couple to it. Its measure is duration under pressure to close, and its failure mode is early termination in a settled response. It is a property of how a question is held over time and admits of cultivation, with the encounter it prepares for remaining unschedulable.*

Three consequences follow immediately.

The first is that the Walpolean constraint is satisfied. Walpole excluded discoveries of what one was seeking. A maintained unresolved relation falls outside the category of search: it specifies no target, and it is precisely the absence of a specified target that leaves the relation available to a phenomenon from an unrelated domain. A researcher seeking a solution to a stated problem will accept only candidates of the stated type. A researcher holding the difficulty open, with the form of a solution undetermined, can be met by a mineral.

The second is that the capacity is costly and its cost explains its rarity. An unresolved relation is uncomfortable. It occupies attention, resists summary, and produces nothing while it is held. Every professional incentive rewards closure: publication requires results, teaching requires answers, and institutional evaluation counts settled outputs. Maintained non-closure is therefore expensive under exactly the conditions in which research is conducted, and its scarcity is a structural fact about those conditions.

The third is that expertise and sagacity are independent. Expertise is organized, closed knowledge, and its value derives from the closure: an expert answers quickly and correctly because the relevant relations are resolved. A configuration of resolved relations offers few valences for an unforeseen phenomenon to couple to. This yields a testable expectation about where serendipity concentrates, examined in §10.

7.2 *Failure Modes*

Three ways of failing to maintain a relation can be distinguished, and they call for different remedies.

Premature resolution closes the relation by accepting an available answer. The answer may be adequate; adequacy is what makes the failure hard to see. Camus's charge against the Kierkegaardian leap has this form, and so does the ordinary research pathology of settling on the first workable hypothesis.

Aesthetic termination closes the relation by discharging the phenomenon into a settled category. The crystal case is its type. The category is correct and the discharge is complete, and the response feels like engagement while performing closure.

Abandonment closes the relation by dropping it. The question is set aside as intractable or unprofitable, and the configuration loses the valence. This is the failure most encouraged by institutional pressure, since the abandoned question leaves no trace to be accounted for.

7.3 *The Precedents for the Capacity*

The capacity has a longer practical history than theoretical one, and three precedents establish that it is real and trainable.

Zen kōan practice, as §4 sets out, is the deliberate induction and maintenance of an unresolved question under sustained pressure, with the tradition holding explicitly that the depth of the eventual generation is proportional to the depth of the doubt maintained. The trigger is characteristically trivial and always contingent.

Weil's attention describes the same capacity in the register of receptivity: thought held empty and waiting, seeking nothing, ready to receive the object that is to penetrate it, and distinguished from will, which cannot perform the operation.

Keats's negative capability, formulated in a letter of December 1817, names the condition of remaining in uncertainties, mysteries, and doubts without irritable reaching after fact and reason. The formulation is aesthetic in origin and structurally identical in content, and it supplies the term's clearest English statement.

That three traditions with no contact between them converged on the same capacity is evidence that the capacity is a real feature of cognition. What the present account adds is its function: the maintained relation is the valence by which a contingent phenomenon can couple, and the capacity is therefore a condition of generation, beyond its standing as a discipline of character.

7.4 *The Second Condition*

Maintenance is necessary and insufficient. A relation may be held open for years while the phenomenon that would couple to it is routinely encountered and routinely filed elsewhere.

This is the condition treated in the next section, and the two together are what the central claim asserts to be jointly necessary.

8 RELATIONAL CRYSTALLIZATION AND THE FORECLOSURE OF ENCOUNTER

The account so far concerns an individual encounter. Its extension to the architecture of knowledge follows from a single observation: the categories that sort phenomena determine which encounters can occur.

8.1 *Local Coherence*

A discipline is a relational crystallization. Within it, methods, standards, vocabularies, and exemplars are mutually adjusted, and the adjustment is what allows work to proceed: a shared vocabulary permits argument, shared standards permit assessment, shared exemplars permit training. This local coherence is productive and is the condition of competence.

The metallurgical figure is apt in more than name. A polycrystalline solid derives its strength from its grain boundaries, which impede the propagation of dislocations; the Hall-Petch relation makes yield strength increase as grain size falls, so that a material of many small coherent domains outperforms one large uniform crystal. Local coherence with structured boundaries produces properties that homogeneity does not. Applied to knowledge, the figure recommends disciplines and recommends their multiplicity.

8.2 *The Ontologization of a Boundary*

The failure begins at a determinate point. A boundary that organizes work is taken for a boundary in the world, and local coherence is read as ontological independence. The discipline then holds that its objects are its own, that questions outside its remit concern other objects, and that the partition tracks a division among things.

The consequence for encounter is direct. A boundary of this kind sorts a phenomenon before an observer can meet it. The crystal is filed under crystallography, and filing is a closure operation of the kind §5 describes, performed by an institution and inherited by the individual. The observer who has internalized the partition meets the crystal already sorted, and the relation to a question about political plurality has been foreclosed before the encounter occurred. Foreclosure at the level of architecture and closure at the level of the individual response are the same operation at two scales.

Claim 5. (Local coherence and the ontologized boundary) *Disciplinary boundaries are relational crystallizations whose local coherence is productive. Foreclosure begins where local coherence is taken for ontological independence, at which point the boundary sorts a*

phenomenon away from a question before the two can meet. The failure is the treatment of a working partition as a division among things.

8.3 *The Existing Analysis and What Is Added*

The sociology of science has established the constructed character of these boundaries. Gieryn (1983) analyses boundary-work as the rhetorical demarcation of science from non-science, undertaken for professional ends. Star & Griesemer (1989) identify boundary objects that are plastic enough to travel between social worlds and robust enough to maintain identity, permitting cooperation without consensus. Galison (1997) describes trading zones in which subcultures coordinate through local exchange languages while continuing to mean different things.

These accounts are descriptive and sociological, and they establish the premise. The extension offered here is a consequence about generation: a partition that is treated as ontological governs which encounters are available, so that the cost of disciplinary independence is paid in foregone couplings that no participant observes, since a foreclosed encounter leaves no record. This connects the sociological finding to the epistemological one and identifies what interdisciplinarity is for. Its value lies in the restoration of couplings that a partition had foreclosed, and this is a stronger and more specific rationale than the appeal to breadth that ordinarily supports it.

8.4 *The Conjunction of the Individual and Structural Conditions*

The two conditions can now be stated together. A configuration must carry live and unresolved relations, which is the individual condition of §7. And the architecture within which the observer works must leave the relevant boundaries permeable, which is the structural condition of this section. Either alone is insufficient. A scholar with maintained open questions, working within a partition that sorts every incoming phenomenon into a foreign compartment, generates nothing from contingency. A scholar in a permeable environment with no open questions files everything correctly and generates nothing either.

9 THE DYNAMICS OF ABSORPTION AND AMPLIFICATION

The terms of the account have an evident counterpart in the language of dynamical systems: an open relation, a perturbation, a threshold, and the conversion of a perturbation into a sustained state. This section develops that counterpart for a minimal model, with two aims. The first is to show that the two conditions of §8 can be carried by a single parameter. The second is to give the distinction between a wasted contingency and a converted one a determinate form, which in such a model is a threshold.

9.1 *The Form of the Model*

Let $x(t) \geq 0$ measure the generative activity sustained around an open relation within a relational system. Two tendencies act on it.

The first is closure. Left to itself an open relation resolves: the question receives an answer, the phenomenon is filed under an available category, the difficulty is set aside. A linear decay $-x$ represents this, returning the system to $x = 0$, the state in which no relation is held open and every arriving contingency is absorbed without effect.

The second is the return of generation upon itself. What has been generated becomes available as a term for the next coupling, so that generation already underway makes further generation possible. This return saturates, since the capacity of a system to hold relations open is finite. A saturating autocatalytic term represents it, with $r > 0$ collecting the strength of the return:

$$\frac{dx}{dt} = -x + \frac{r x^2}{1 + x^2}. \quad (1)$$

The parameter r carries the two conditions that §8 found jointly necessary. It rises with maintained non-closure on the side of the configuration and with permeability on the side of the architecture, and it falls as either declines. A system whose questions resolve quickly, and a system whose boundaries sort each arriving phenomenon into a foreign compartment, both have low r whatever their stock of knowledge, which is the formal counterpart of the independence of expertise from receptivity claimed in §7.

9.2 *Regimes and the Critical Value*

The origin $x = 0$ is a fixed point for every r , and it is stable throughout, since the linearization there gives -1 . The remaining fixed points solve $x^2 - rx + 1 = 0$, so that

$$x_{\pm} = \frac{r \pm \sqrt{r^2 - 4}}{2}, \quad (2)$$

which is real for $r \geq 2$. The model therefore has a saddle-node bifurcation at $r_c = 2$, where the two roots coincide at $x_c = 1$. Figure 1 shows the resulting structure.

Three regimes follow, and each corresponds to a condition the earlier sections described in prose.

For $r < 2$ the closed state is the only attractor. A contingency of any magnitude decays, and the system returns to the state in which nothing is held open. This is the regime of the aesthetic terminus of §5 and of the foreclosed architecture of §8, which the model renders as one condition seen twice.

At $r = 2$ the sustained state appears at $x_c = 1$, and the threshold appears with it.

For $r > 2$ the system is bistable. A perturbation below x_- decays and the contingency is wasted; a perturbation above x_- is amplified and settles at x_+ , where it persists without further

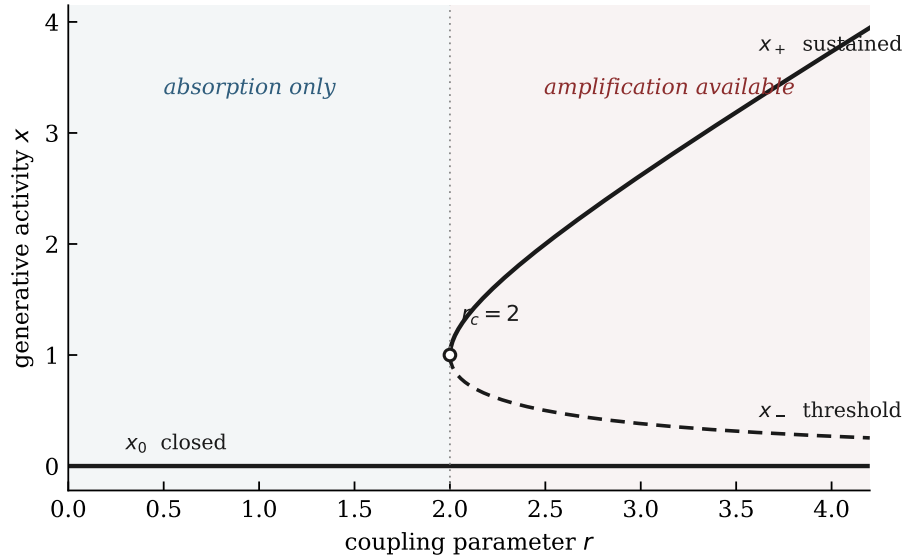


Figure 1: Fixed points of (1) against the coupling parameter. Solid branches are stable, the dashed branch unstable. Below $r_c = 2$ the closed state is the sole attractor and every perturbation is absorbed. Above it a sustained state x_+ becomes available, reachable from perturbations exceeding the threshold x_- .

input. The trajectory from a perturbation to x_+ is the process Definition 2 of §6 describes: a contingency generated within the field is transformed into the possibility of the system's continued generation.

9.3 The Threshold of Sufficient Contingency

The threshold x_- falls as r rises, from $x_- = 1$ at criticality toward zero for large r . A consequence follows that bears on the cases. The magnitude of contingency required to produce a conversion depends on the openness of the system receiving it, so that a system holding relations open under strong maintained non-closure can be moved by a contingency of very small magnitude, while the same contingency arriving at a system near criticality is absorbed and lost.

This yields a reading of a pattern the traditions record without explaining. In the accounts surveyed in §4, the trigger of a resolution reached after years of maintained doubt is characteristically trivial: a pebble against bamboo, blossoms across a valley, a phrase from a children's game overheard through a wall. The triviality of the trigger and the depth of the maintained relation stand in the relation the model predicts.

Figure 2 displays both features. In the left panel one perturbation of fixed amplitude meets four systems and has three fates, which is the two-observer datum of §5 generalized: the difference lies wholly in the receiving configuration. The case at $r = 2.05$ deserves particular

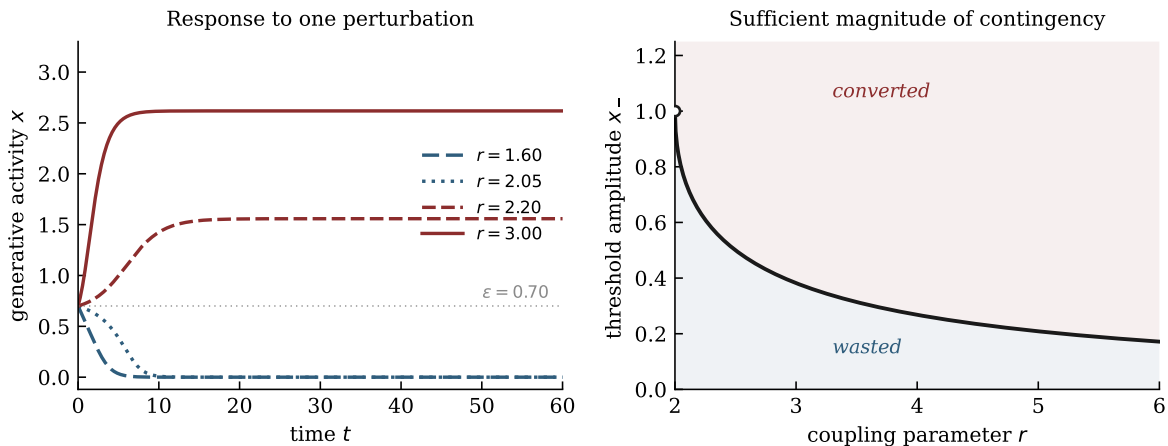


Figure 2: Left: the response of (1) to a single perturbation of fixed amplitude $\varepsilon = 0.70$ under four values of the coupling parameter. At $r = 1.60$ no sustained state exists. At $r = 2.05$ the sustained state exists and the threshold stands at $x_- = 0.80$, so the same perturbation decays. At $r = 2.20$ the threshold has fallen to $x_- \approx 0.64$ and the perturbation is amplified, with the slow approach characteristic of a trajectory passing near a saddle-node. At $r = 3.00$ the threshold stands at $x_- \approx 0.38$ and the conversion is rapid. Right: the threshold amplitude against the coupling parameter, dividing perturbations that are converted from those that are wasted.

note, since there the sustained state exists and remains unreachable from a perturbation of this magnitude. A system may therefore possess the capacity for conversion and waste a given contingency for want of sufficient magnitude, which distinguishes the failure of §8, where no coupling is available at all, from a failure of degree.

The trajectory at $r = 2.20$ shows the protracted approach characteristic of motion near a saddle-node. A conversion occurring close to the critical value takes long to consolidate and remains vulnerable throughout, since a further disturbance during the passage can return the system to the closed state. This offers a formal counterpart to the observation that an insight arriving in a barely-open configuration is easily lost.

9.4 The Standing of the Illustration

The model earns its place by the structure it exhibits, and its adequacy rests on three correspondences: between the decay term and closure, between the saturating autocatalytic term and the return of generation upon itself, and between the coupling parameter and the joint condition of maintained non-closure with permeability. Each is a claim about what the prose account describes, and each is available for objection independently of the others.

What would raise the illustration to a model in the working sense is stated here for the record. It requires an operational measure of r in a research setting, which §12 identifies as the principal open problem; an independent identification of x with something observable in a

configuration, for which the count of maintained unresolved problems is the obvious first candidate; and a treatment of systems holding several open relations at once, where (1) becomes a coupled system and the couplings between open relations become the objects of interest. The reflexive case identified in §10, where the generated meaning alters the phenomenon, would enter such a treatment as feedback from x to the perturbation itself.

10 CASE CONSTRUCTIONS ACROSS DOMAINS

Seven cases follow, drawn from six domains and constructed to bear on distinct elements of the account. Three are paired with a negative counterpart in the same domain, since the account's diagnostic content lies in the failures as much as in the successes. All are drawn from the published record and are developed for illustration.

10.1 *Materials Science and Political Plurality*

The crystal case can now be given its structure. The configuration carries an unresolved question about whether a political order can hold a plurality of coherent linguistic worlds together without reducing them to a common medium, a question that resists resolution because the available answers appear to require either a shared language, which flattens, or an accepted fragmentation, which dissolves the order.

The phenomenon has a determinate structure. A polycrystalline solid consists of domains each internally ordered, differing in orientation, meeting at grain boundaries that neither dissolve the domains into one another nor separate them. The Hall–Petch relation establishes that the boundaries contribute to the strength of the whole. Nucleation and growth proceed by local rules, with no global template.

The coupling generates a third term: an order composed of internally coherent domains whose integrity is maintained by their boundaries, with the boundaries functioning as sites of relation, and with the strength of the whole arising from the structured heterogeneity. This is neither a fact about minerals nor a prior political position, and its transposition into the theory of multilingual plurality raises questions of its own about what corresponds to orientation and to dislocation. The case illustrates the thirdness of the product and the participation of the phenomenon's structure.

10.2 *Cosmology and the Interpretation of Noise*

The case of the cosmic microwave background is the clearest instance in the modern record of one signal meeting two configurations.

In 1964 Penzias and Wilson, working with the Holmdel horn antenna at Bell Laboratories, measured an excess antenna temperature at 4080 Mc/s of approximately 3.5 K that they could not eliminate. Their configuration was that of radio engineers with an instrumental problem,

and within it the signal was a residual to be accounted for. At Princeton, Dicke, Peebles, Roll, and Wilkinson carried an unresolved theoretical question about the thermal residue of an early hot universe, and were building an instrument to look for it. The two papers appeared together in *Astrophysical Journal* 142 in 1965, the measurement and its interpretation (Penzias & Wilson, 1965; Dicke et al., 1965).

The case is instructive in three respects. The same information was available to both parties, and only one relation generated a cosmological meaning, which is the two-observer datum in its purest form. The Princeton configuration was open in the required sense: a question was being carried without a determined answer. And the generation occurred at a coupling across a boundary between radio engineering and theoretical cosmology, which illustrates §8 from the permeable side.

10.3 *Intelligence Analysis, Positive and Negative*

Two episodes in the same domain form a matched pair.

In October 1962, photographic imagery returned by a U-2 overflight of western Cuba was interpreted at the National Photographic Interpretation Center as showing a Soviet medium-range ballistic missile installation under construction. The imagery is a field with vehicles and cleared ground. Its interpretation required a configuration containing the signatures of Soviet missile-site layouts, held by analysts trained for exactly that recognition. The information in the photograph was available to anyone with the photograph; the meaning arose at a specific relation.

The negative counterpart is the finding of the 9/11 Commission that the relevant information was distributed across agencies and that the failure lay in the connection. The Commission's characterization of a failure of imagination is precise on the present account. The information was present, the analysts were competent, and the architecture partitioned the material so that a phenomenon arriving in one compartment could not couple to a question held in another. This is foreclosure by architecture in its consequential form, and it illustrates why the cost of a partition treated as real is paid invisibly.

10.4 *Decipherment*

The Rosetta Stone was recovered in 1799 and remained substantially mute for two decades. The object's information content did not change across that interval. What changed was the arrival of a configuration in which the Greek text, a knowledge of Coptic, and a hypothesis about the phonetic function of the cartouches were held together with the question unresolved, at which point the stone participated in the generation of a decipherment. The case isolates the temporal structure: the phenomenon waited, and the encounter occurred when a configuration capable of coupling to it existed.

10.5 *Economic Interpretation*

An inversion of the yield curve is a single quantity available simultaneously to every participant in a market. It is read by one party as a recession signal warranting a defensive reallocation, by another as a distortion produced by central-bank holdings and therefore uninformative, and by a third as a repricing opportunity. The three readings are generated at three relations to one signal, and the participants are equally informed in the transmission sense.

The economic case adds a feature the others lack. The generated meanings are acted upon, and the actions alter the phenomenon. This is a reflexive structure in which the relation feeds back into its own object, and it marks a limit of the account as presently stated, which treats the phenomenon as stable across the encounter.

10.6 *Ordinary Relation*

A remark made in passing over dinner is received by one hearer as small talk and by another, who has been carrying an unresolved difficulty about a decision, as the thing that resolves it. The speaker intended neither and often learns of the second reception later or never.

The domestic case is included because the account should hold outside organized inquiry, and because it displays the two conditions with unusual clarity. The hearer who generates was carrying a live question; the hearer who did not was not. Neither hearer was more intelligent, and the remark carried identical information to both. The case also displays the failure of the attribution model: what was generated cannot be credited to the speaker, who supplied a phenomenon and no meaning, and cannot be credited to the hearer alone, who supplied a question and no answer.

10.7 *Cross-Domain Transfer*

The final case concerns encounters between a configuration and a whole domain.

Eglash's trajectory runs from a training in cybernetics and systems engineering into ethnomathematics, producing an analysis of recursive and fractal structure in African design and settlement patterns, and subsequently the concept of generative justice, an account of value that circulates in unalienated forms at its point of production. The pattern is the paper's structure at the scale of a career. A configuration formed in one domain met the objects of another, and generated an account that neither domain contained: the mathematics did not contain the design tradition, and the design tradition had not been described in those terms. The prior training operated as the condition of the difference, and the encounter required a permeable boundary between a physical science and an ethnographic subject matter.

Comparable transfers are numerous. Schrödinger's treatment of the aperiodic crystal carried a physicist's configuration into the question of heredity and participated in the formation of molecular biology. Cybernetics entered the social sciences through the Macy conferences.

Statistical mechanics entered finance. In each the generated account was in neither the exporting configuration nor the receiving domain.

The cases can be summarized by their common structure.

<i>Setting</i>	<i>Configuration carried</i>	<i>Contingent phenomenon</i>	<i>Generated term</i>
Materials and plurality	Unresolved question on coherence within plurality	Grain-boundary structure of a polycrystal	Order composed of bounded coherent domains
Cosmology	Thermal residue of an early hot universe	Irreducible excess antenna temperature	Observational confirmation of a cosmological model
Imagery analysis	Signatures of missile-site construction	Cleared ground and vehicle placement	Assessment of strategic deployment
Decipherment	Coptic, a Greek parallel, a phonetic hypothesis	A trilingual inscription	A working decipherment of a script
Market signal	Position, horizon, and model of the instrument	Inversion of a yield curve	Divergent readings acted upon
Ordinary relation	A carried and unresolved personal difficulty	A remark made in passing	A resolution credited to neither party
Cross-domain transfer	Cybernetic and recursive formalism	An unfamiliar design tradition	An account contained in neither domain

Table 1: Structure of the cases by configuration, phenomenon, and generated term.

11 SERENDIPITY IN THE CONDUCT OF INQUIRY

Three consequences follow for how inquiry is conducted and organized.

11.1 *The Standing of the Phenomenon*

Serendipity has been treated in the literature on research policy as a marginal occurrence, valuable and unmanageable, to be accommodated at the edges of directed programmes. The account developed here places it differently. If meaning is generated relationally, and if a research programme consists in maintaining questions and encountering phenomena, then serendipity is the ordinary form of the arrival of new meaning and directed search is the special case in which the target has been specified in advance. The specification is efficient where the answer is of a known kind. Where it is not, the specification excludes in advance the couplings that would supply it.

11.2 *Cultivation without Planning*

The two conditions are both amenable to deliberate action, and neither amounts to planning an encounter.

On the individual side, the maintained open question is the unit to be protected. This has practical content. A researcher can keep a written record of unresolved difficulties and revisit it, decline to resolve a question by the first adequate answer, and treat the discomfort of an open problem as a working state. The cost identified in §7 indicates where the pressure will come from, and an institution that counts only settled outputs is applying that pressure continuously.

On the structural side, permeability is the property to be maintained. Its practical content includes exposure to material outside one's partition without a requirement that the exposure be justified in advance by an expected yield, since a yield that could be specified in advance would fall under directed search. Galison's trading zones and the boundary objects of Star and Griesemer describe arrangements in which such exposure occurs, and the account here supplies the reason to value them.

11.3 *The Discipline of Non-Closure*

The third consequence concerns intellectual conduct. The failure modes of §7 are all forms of closing early, and each has a respectable appearance. Premature resolution appears as decisiveness, aesthetic termination as appreciation, and abandonment as realism. A discipline of non-closure therefore requires the capacity to recognize a closure operation while performing it, which is what the traditions surveyed in §4 train and what the vocabulary offered here is intended to make available in secular terms.

12 LIMITS AND FURTHER WORK

12.1 *The Standing of the Central Claim*

The account rests on a claim about where meaning arises, and the claim admits of no direct observation. What can be observed is the differential: two configurations, one phenomenon, two outcomes. That differential is compatible with the account developed here and with a sufficiently elaborate observer-side account in which the generated meaning was latent in the configuration and released by any adequate trigger. The consideration that favours the relational reading is the participation of the phenomenon's specific structure, since the polycrystalline account of plurality carries the grain boundary and the orientation with it and would not have been generated by an arbitrary trigger. This consideration is a matter of degree, and a latency theorist may hold that the structure supplied detail to a form already present. The dispute is real and is left open.

12.2 *Points of Exposure*

Four points are exposed.

The relation to Barad and Simondon requires more than the compatibility argument offered in §6. If relata are constituted within relations, the description of a configuration as an antecedent term needs a fuller account of the timescales at which each description holds.

The reflexive case identified in §10 lies outside the account as stated. Where the generated meaning is acted upon and alters the phenomenon, the encounter has a dynamics the present treatment does not supply.

The criterion of closure has been characterized and not operationalized. An account that can distinguish a maintained open relation from an abandoned one only after the fact is a description of cases and not yet an instrument for assessing them.

The Zen material raises a question the paper has acknowledged and not settled. If the kōan tradition holds that what arrives was always present, and if the account here holds that it is generated, then either the traditions describe different phenomena or one description is mistaken, and the cases do not decide between them.

12.3 *Further Work*

Three lines follow.

The first continues the formal treatment begun in §9. The illustration there carries a single open relation and a single scalar parameter, and the questions that matter lie beyond both: a configuration holding several open relations at once, the couplings among them, and the conditions under which activity at one relation raises or lowers the threshold at another. The reflexive case, in which the generated meaning alters the phenomenon, enters at the same point.

The second is empirical. The expectation stated in §7, that serendipity concentrates where configurations carry unresolved relations and where boundaries are permeable, is amenable to study in settings where research trajectories are documented. Careers that cross domains, and laboratories with recorded histories of abandoned and revived problems, are the tractable cases.

The third concerns the relation between this paper and the governance programme it belongs to. If foreclosure is a structural property of how knowledge is partitioned, then the design of institutions that maintain permeability is a governance question, and the criterion by which such designs would be assessed has not been supplied.

A note on the treatment of the traditions. The surveys in §§2–4 range across literatures in which the present author holds no specialist standing, and they are offered at the level of structural comparison. Where a

tradition has been characterized by a single doctrine, specialists will find the characterization thin, and in three places the internal disputes have been flagged in passing: the extent of al-Ghazālī's occasionalism, whether Nāgārjuna advances a positive thesis, and the standing of the interpretation objection to Hanson. The comparisons are drawn to locate the account, and corrections that would relocate it are welcome.

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