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<https://doi.org/10.1057/s41599-023-02092-0>

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The tightrope of real genesis: on philosophy's generative thirdness and the creative self-grounding of thought

Will Fraser¹✉

Motivated to bypass the twin basins of absolute relativism and dogmatic absolutism, an antinomic polarity into which thought tendentially falls, this paper offers various conceptual frameworks for overcoming antinomies in philosophical thought, and ultimately asserts that this overcoming occurs at a philosophical system's purported source: its active site of real genesis. The author traces a constellation of thinkers who all invoke this suspended thirdness in their own disciplinary and conceptual registers, from Jean Cavailles to Gilles Châtelet, C.S. Peirce to Cécile Malaspina, ultimately and speculatively suggesting that this third space, the (abductive) hinge of real genesis, might precede and activate a priori the consequent dir- emptions into the polarities of the transcendental and the historical, the mathematical and the physical, the global and the local, the continuous and the discrete, the rational and the empirical, and so on. Such a genetic realism, then, places a radical exigency on philosophical thinking: to grasp its real genetic conditions, that is, without a previously given criterion or method. Ultimately, the paper is most interested in suggesting ways to reconfigure the conceptual landscape around this genetic tension or originating hinge, to encourage thought towards the genetic real and away from disciplinary stagnation, towards generative models for systematic thought itself.

¹Kingston University, London, UK. ✉email: wofraser@gmail.com

Introduction

My aim in this paper is not to solve a problem but to configure the philosophical landscape around a genetic tension. The thematic contention is that real genesis only actually occurs by the disjunction between the continuous and the discrete, the global and the local, the rational and the empirical, the transcendental and the historical, the mathematical and the physical, and so on. Genesis is of a third order, a third way, it is a third thing, ever in-between, and I'd like to speculatively probe this schema of triangulation and thirdness, alongside a kind of dialectical method sympathetic to the "ideal dialectic" discussed by Jean Cavailles and Albert Lautman (Cavaillès and Lautman, 1939, p. 2), for how genetic hinges can be conceptually actualized. I hold invention, rupture, eventhood, novelty, to be essentially articulated-in-diremption in this suspension between poles, and that not attempting to think from this elusive third sidles thought up with either a more comfortable relativism or a blinkered dogmatism. Ultimately, seen from the perspective of real genesis, these two poles are merely janus-faced expressions of each other whose antinomic impasse real genesis dirempts.

If a renewed articulation of mathematical, scientific, and philosophical thought in recent years is emblematic of an historical conjuncture, of "something in the air"—I'm sketchily thinking of the delayed English translations of Badiou, the pioneering work of Fernando Zalamea, transdisciplinary thinkers like Giuseppe Longo, Jean Petitot, Gabriel Catren, Rocco Gangle, and many others—then it is perhaps because of a furtive desire or even demand to conceptualize the *real* at an impasse of naturalized relativism, but also to formalize a vocation for *relativizing the absolute* which admits of the complexity and chaos of reality. What is commendable in contemporary thinkers attempting to dance this dance is, broadly, a non-mystical commitment to truth in genesis, to the adagial notion that "the truth lies in the balance," in some sense; that Ideas in a Platonic sense are only actualized by a *suspension* (or subtraction, or transition) of polarity, and that systematic philosophy needs to dare to walk this tightrope in order to grasp real genesis. This then would be a dialectics for and of Ideas, where the ideal and the real meet in genesis:

One passes insensibly from the comprehension of a dialectical problem to the genesis of a universe of mathematical notions, and it is the recognition of this moment when the idea gives birth to the real that, in my view, mathematical philosophy must aim at. (Cavaillès and Lautman, 1939, p. 10)

Perhaps I could be so bold as to provisionally say that the *price* of the ideal-real genetic jointure just *is* the very *division* into the global and local, the transcendental and historical, the rational and empirical, etc. Actualizing the real *effects* the cost of attending to the dialectic between these various poles via a stereoscopic method which can thereby grasp and birth the *third* which presupposes and produces them. Whether one wants to cast this in terms of a genetic dialectic of Platonic Ideas or Deleuzian differentiation or an epistemologically radicalized Kantian schematism is up to various philosophical mannerisms, but for me the general thrust of this genetic ambition in and for systematic thought is one of the most worthwhile if delirious pursuits in philosophy and philosophy of mathematics.

Jean Cavailles qualifies that "this generative act and criterion of genuine mathematics must be concretely situated, submitted to conditions of actual fulfillment," (Cavaillès, 2021, p. 57) and that "the problem ... is how to apprehend this principle in its generative movement, how to recover this structure not via

description but apodictically, as it unfolds and demonstrates itself" (Cavaillès, 2021, p. 69). Mathematics for Cavailles has a *history*, which must be *necessarily* accounted for in its epochal theoretical unraveling if it is to be a discipline worthy of the name. Indeed, the *necessary* is a key category for Cavailles, and one could remark in some respects that his philosophico-mathematical project is encapsulated by an aspiration to *make the contingent necessary*. The evocative closing line of *On Logic and the Theory of Science* frames the tension well: "The generative necessity is not that of an activity, but of a dialectic" (Cavaillès, 2021, p. 136). Apodictics by dialectics, generation by contingency-made-necessary, genesis by the difference between passivity and activity. History and contingency must necessarily play a formative role, but they must themselves articulate a dialectic which forms them all the same. Take Cavailles at perhaps his most poetic and polemical:

The fact that everything does not happen all at once has nothing to do with history, it is the characteristic of the intelligible. To misrecognize this is to take leave of the security of its immediate presence in favor of a projection whose internal emptiness, but also its collapse into the historical, is revealed clearly enough in its being bound up with the actualisations of a certain era and the contingencies in which they are clothed. There is no attainment of the absolute here, only a hypostasis of systems and procedures whose status is but transitory. To abstract in this way is not to fix the essence, but to halt. (Cavaillès, 2021, p. 83)

I take seriously the notion expressed by Ray Brassier and Iain Hamilton Grant (Avanessian, 2019) that if one doesn't attempt to theorize or think the absolute, one by necessity smuggles it in unbeknownst through the back door. Cavailles' excitement for mathematics seems to come from the realization that it *can generate* the absolute precisely *by the effects it makes* in its dialectical unfolding in historical time. The absolute, mathematical or geometrical Ideas, transcendental truths – it is in the nature of these concepts – and this is in keeping with the radical legacy of German Idealism, French epistemology, not to mention drastic scientific and mathematical upheavals in the past centuries – to be themselves *re-made*. Take Gilles Châtelet:

We know that one of the major ambitions of the philosophy of nature was the patient explanation of the Absolute. It is no longer a question of letting oneself be subjugated by the Absolute (whether in relegating it to the ineffable, or setting it down formally), but of distinguishing stops, problematic hinges where nature and the understanding cross one another, where the first turns itself into 'visible Understanding and the second invisible Nature', where an articulation between the individuation of Being to be known and that of the knowing subject becomes apparent. (Châtelet, 2000, p. 89)

The absolute is *articulated*, it is an articulation of – to put things in terms downstream from German Idealism – the Understanding and Nature, an articulation only grasped at a dialectical crossing of the two. This is an immanent dialectics stemming from a *problematic hinge*, a third disjunctive site which coordinates by dividing. Châtelet even remarks in his essay on Grassmann that the German polymath's – influenced by Oresme – "dialectical 'generation' undoubtedly constitutes [his] most interesting contribution to geometric philosophy" (Châtelet, 2000, p. 102). Importantly, geometric philosophy for Châtelet must aspire to the realization that "it is not a matter of *constructing* space, but of letting oneself be bewitched by a rhythm: that which knots and weaves homogeneities gorged with

tensions” (Châtelet, 2000, p. 104, my emphasis). Generation can only occur by submitting theoretical knowledge to the genetic realization of a structural problem: “*The capture of the extension does not concern only the knowledge of the subject, it feeds itself on the individuation of the knowledge of the subject*” (Châtelet, 2000, p. 104, emphasis in original). Moreover, for Châtelet via Grassmann, “to know, it is first necessary to be penetrated by the rhythm of learning” (Châtelet, 2000, p. 104). Experiential learning has a texture, a rhythm, an oscillatory effect, which must be accounted for, but which can only be formally accounted for *by being dialectically generated*, that is, by incarnating the genetic tension which knowledge syncopates. In fact, it seems that for anything to be actually generative already implies this dialectical relay; or, for anything to be formally tractable as generative necessarily means that this rhythmic bewitchment has been momentarily articulated with a formal leap. Badiou reminds us:

The word ‘articulation’ is one of Châtelet’s key-signifiers. It designates the active unity of an operation as a preliminary to any determination of a duality; the dialectic is indeed ‘one divides into two’ and not ‘two is extenuated into one’. But it has to be understood that the One is no more than one dimension that is unfolded by the latent play of an articulation that is still there before One is divorced from Two. The dialectic is never a dualized sequence of concepts. The dialectic is the polarization of a space that is articulated. (Badiou, 2009, pp. 167–8)

And Châtelet again:

It is not a question ... of deducing statements from a body of axioms, but of *putting into operation a discipline of discernment* that separates degrees of articulation in space and in the mind and that can be applied to dialectics: that of the discrete and the continuous and that of the intensive and the extensive. (Châtelet, 2000, pp. 106–7, my emphasis)

One can sense the active-passive dialectics at work in this *operative discernment*, as well as the indispensable methodology of separation or division, which this discipline of discernment actually carries out, allowing for the very difference between the discrete/continuous, the intensive/extensive, to be illuminated. It is a learning to discern the rhythm of polarization and articulation; at the limit, one realizes the disjunctive simultaneity, the genesis, of this bewitching dialectic.

Dialectic is here to be understood as ‘the intelligence that separates and, by very reason of this separation, introduces an order into things and imposes a form on them’; dialectic does not abolish difference, it illuminates and deepens it. (Châtelet, 2000, p. 106)

There is a formal disjunctive order at the limit of thought and experience whose dialectical pronunciation lets blossom.

This genetic order also shares a kind of homologous function to a different register of rational thought: not deductive reason, and past inductive reason, to processes of *abductive reason*. Abductive reasoning becomes first explicitly formulated in the work of Charles S. Peirce. It is worth quoting one of his general definitions at length:

The whole operation of reasoning begins with Abduction, which is now to be described. Its occasion is a surprise. That is, some belief, active or passive, formulated or unformulated, has just been broken up. It may be in real experience or it may equally be in pure mathematics, which has its marvels, as nature has. The mind seeks to bring the facts, as modified by the new discovery, into order; that is, to form a general conception embracing them. In some

cases, it does this by an act of generalization. In other cases, no new law is suggested, but only a peculiar state of facts that will ‘explain’ the surprising phenomenon; and a law already known is recognized as applicable to the suggested hypothesis, so that the phenomenon, under that assumption, would not be surprising, but quite likely, or even would be a necessary result. This synthesis suggesting a new conception or hypothesis, is the Abduction. It is recognized that the phenomena are like, i.e., constitute an Icon of, a replica of a general conception, or Symbol. This is not accepted as shown to be true, nor even probable in the technical sense, – i.e., not probable in such a sense that underwriters could safely make it the basis of business, however multitudinous the cases might be; – but it is shown to be likely, in the sense of being some sort of approach to the truth, in an indefinite sense. (Peirce, 1998, p. 287)

A “surprise” demands one to theoretically hypostasize a likely explanation in an interrogative mood, so that a third term is “abduced” for the sake of reasonable explanation, which necessarily disrupts a given framework, such that the abduction functions as a relational explainer for novelty between the continuous and discrete, the deductively rational and inductively empirical. Abduction then

...becomes an engine of discovery if it is treated not as something to be evaluated simply and immediately as either valid or invalid but rather as an internal deformation of the epistemic framework where it originated, a deformation that opens new possibilities and potentials. (Caterina and Gangle, 2016, p. 8)

And, like with Châtelet and Cavallès, this method of reasoning is necessarily context-bound and experientially mediated, such that “any genuine abduction takes place in a concrete context of knowledge, ignorance and experience ... [where] ignorance is not simply a privation of knowledge, but is – or at least can be – a goad to discovering or generating knowledge” (Caterina and Gangle, 2016, pp. 13–14). This leads authors Gianluca Caterina and Rocco Gangle to the formulation that

[t]he basic “shape” of experience as a cognitive agent’s immediately affective and mediatedly epistemic relation to the real world is the warp to abductive reasoning’s woof. (Caterina and Gangle, 2016, p. 14)

My speculative rejoinder would then be that prior to the problem of induction would be the problem of abduction, whose generative cost just *is* the diremption of history from transcendence, but whose articulative hinge consequently *allows* for the very exchange between transcendental invariants and historical contingency, and in fact can actually play the role of *re-making* both horizons by way of its abductive power in suspension. Indeed, as far as “the problem of ‘creative novelty’ in abductive inference” goes (Caterina and Gangle, 2016, pp. 15–16),

[i]t is not the event’s intrinsic features that make it surprising, but the relation – or rather, the lack of relation, the failure of correspondence – between the event and the theoretical framework of explanations and expectations through which the agent comports herself in the world. (Caterina and Gangle, 2016, p. 17)

Furthermore, this raises questions of our very species evolution, of the birth of geometry itself, as abductive events whose processual actualization and creation concern “the problem [of] *how to generate a representation at all*” (Hoffmann, 2003, p. 129) – after all, “abduction is concerned with the problem of discovery” (Hoffmann, 2003, p. 128). Again, there is a third more

original way which is prior to the poles of deduction and induction, and it's no small wonder there's been a return to Kant and Hegel in contemporary philosophical realisms, for this absolute "third thing" is the congenital elephant in the room which needs to be conceptualized and systematized.¹ Michael H.G. Hoffmann formulates a way out of the impasse well, in his article exploring Peircean abduction as it relates to diagrammatic reasoning for learning:

[W]e can say that *in practice*, the old problem of induction can be handled by taking into account *contextual constraints*. In other words, I suggest that a first step towards a solution of the learning paradox is to stop considering inductivism and apriorism as two mutually excluding alternative starting points, and to consider them instead as inherently intertwined within a common context. (Hoffmann, 2003, p. 129)

Consequently, while we can certainly radically critique him and try to subvert him, we cannot ignore Kant and his schematism which bridges the gap between the rational and empirical, which can in fact be read to play the role of the third which presupposes and produces these poles, as "a hidden art in the depths of the human soul" (Kant, 1998, A141/B181). In fact, following Peirce, we'd likely do well to dialectically *processualize* this Kantian schematic art, which of course brings us close to Hegel but more importantly here to a legacy of French epistemology and philosophy of science from Bachelard to Cavallès, Simondon to Châtelet, which *dares* to theoretically grasp and conceptualize the processual, if dialectical, movement of this original-synthetic third.

For Peirce, there is no dualism between *external* things that are given in "appearances" and the *internal* processes of a priori "ratiocination." Instead, the role which perception plays in both areas clearly shows there is a continuity between the two. (Hoffmann, 2003, p. 132)

Furthermore, in order to grasp this tensional continuity, Peirce believes that diagrammatization, or diagrammatic reasoning, is "the most promising candidate for making it possible to study the interplay of internal and external aspects in abduction and creative thinking," (Hoffmann, 2003, p. 132) which he will develop in his Existential Graphs for representing thought.

Thus, in contradistinction to a computationalist reading of the slave boy's interrupted reasoning in Plato's *Meno*, the Peircean Hoffmann will offer that Socrates' drawn diagram in the sand

externalizes the boy's thought ... [and] *chang[es]* the representational system, by substituting the geometric approach for the arithmetical approach, [so] the boy gets the possibility of controlling his own thought, and making it more precise. (Hoffmann, 2003, p. 139)

By hypostatic abstraction of the new concept of a "diagonal" the *Meno* offers an early account of abductive diagrammatic reasoning, allowing the slave boy to externalize his mind precisely by internalizing the world, a transit which pure deduction or induction do not allow, and whose mutual exclusion leads to infinite stalemate or infinite regress. Here, diagramming the diagonal of the square articulates the contingent physical and historical ephemerality of the sandpit with the transcendental geometry in the rational mind. In fact, we'd do well to remember with Giuseppe Longo that contingency is itself always relative to theorization: "the notion of randomness is relative to the intended theory" (Longo, 2018).

Thus, the solution to the learning paradox [in the *Meno*] may reside in seeing that learning occurs through the *process* of diagrammatic reasoning, the analysis of which

unmasks the dichotomy of apriorism and inductivism as both superfluous and fundamentally ill-conceived. (Hoffmann, 2003, p. 140)

A similar tensional conditionality is drawn out in Cécile Malaspina's *An Epistemology of Noise*, whereby this differential abductive relation is the one at stake between *information* and *noise* coming out of cybernetics and systems theory. Once again, as in previous examples the productive difference is immanent to the process: "the dividing line between information and noise now runs *within* entropy, rather than between entropy and its negation," (Malaspina, 2018, p. 19) so that the context-sensitivity of the two terms indexes a conjoined dependence on each other in a third disjunctive term, which could be formulated in a paradoxical sense as "a *form of measurable uncertainty*" (Malaspina, 2018, p. 19). The direct resonance with prior concepts of abduction but also with contingency-made-necessary should be evident here. What's remarkable about Malaspina's text is it foregrounds and pushes further Gregory Bateson's idea of information as only ever "a *difference that makes a difference*" (Bateson, 1972, p. 453) into a theory of epistemological novelty, whose twin poles – aligned with deduction/induction but also the rational/empirical as well as to some extent other polarities previously mentioned such as the transcendental/historical and mathematical/physical – are characterized as *complete redundancy* and *absolute uncertainty*, both of which are antinomic equilibria whose twin accidentance an *epistemology of noise* would transmute into the refrain of actual informational novelty.

In fact, the radical thesis I draw from this work is that reality *itself* only ever *means* when it is *novel*, when it is abducted through dialectical synthesis by suspending a polarity for the sake of its third retroactive presupposition: "the distinction between information and noise is always a *process in the making*" (Malaspina, 2018, p. 26).

Neither absolute uncertainty nor complete redundancy, on their own, thus suffice for a notion of information that does what the word information says, which is to inform. A viable concept of information must satisfy the criterion of *genesis of form* ... [and] to sustain a process of genesis of form and transformation of diverse domains, [a concept of information] must be capable of sustaining the conceptual tension between the two opposed terms. (Malaspina, 2018, p. 71, my emphasis)

Following Gilbert Simondon, *metastability* is a crucial notion for this dynamic suspension, for the site of the metastable itself affords grasping the genetic presupposition of the opposed terms as *what will have been*, in the future anterior. The implications are profound, for if we aren't able to gain traction on the formal genesis in and of this diremption, the suggestion is that we consequently aren't able to *transform* the deadlocks of historical reality. To think the genesis of form just *is* to transform the very limits of knowledge, because *pace* this reading of information theory, for meaning to *mean* anything, it has to be *new*, which is to say it *has* to be *generated*. Which, in Malaspina's register of the noise necessary for knowledge, incites a radical protocol for reason's generation, or self-grounding, itself:

We can now think of noise in terms of a fundamental epistemological contingency, a state of suspension or indecision, from which reason emancipates itself with acts of self-grounding. As the groundlessness that necessarily precedes our own rational self-grounding, noise is no longer marginal to philosophical discourse, no longer reducible to mere error. Noise can, instead, be thought as a fundamental philosophical problem: as the groundlessness that necessarily precedes reason's act of self-

grounding. What is at stake with the question of noise, is ultimately a vital and epistemological normativity, an emancipatory act of self-grounding, that is conditioned by no ready-made control law, grounded in nothing but itself. (Malaspina, 2018, p. 217)

This immanentizing of the transcendental emblemizes the historical exigency placed on reason for (re-)thinking its own genetic conditions. Indeed, the geometry or topology of thought must itself be continually re-thought and transmitted out of its sedimentation and stagnation and into the whirlwind of multi-scalar complexity and noise. But to lose sight of the genetic third which abductively articulates through invention would risk losing not only conceptual traction on chaotic uncertainty but also a real political or ethical purchase on transforming the deceptive historical oppression in cultural relativism. As Derrida beautifully remarks in his critical introduction to Husserl's *Origin of Geometry*: "Historical incarnation sets free the transcendental, instead of binding it. This last notion, the transcendental, must then be rethought" (Derrida, 1978, p. 77). And perhaps exemplary in this case contemporarily on the terrain of geometry and mathematics is the inspiring work of Fernando Zalamea, whose emphasis on the "general operativity of the *trans-*" (Zalamea, 2012, p. 364) in contemporary mathematics underscores examples in contemporary mathematics which map "emergences of relative universals" (Zalamea, 2012, p. 366) against the insidious obverse of absolute relativism, postmodernism's *telos*.

While we certainly cannot regress then to the dogmatic inertia of armchair philosophizing, philosophy must also absolutely resist falling into a naturalized fatalistic relativism, leaving full sway to historicist contingency. As Anna Longo writes:

[I]f knowledge is the [mere] outcome of a history of exchanges and interactions with the environment, then any new representation of this environment is not the expression of the creative autonomy of thinking, but of a natural unpredictable non-rational drift which expresses itself within processes of individuation and differentiation. (Longo, 2017)

By contrast, and channeling the ethos of Cavailles' fellow traveler Albert Lautman, Longo emphasizes the necessity of a dialectic of history with *reason*:

Lautman's dialectic is then a rational method of discovery that; instead of pointing to the most general in order to arrange and organize the plurality of mathematical objects, distinct elements and domains under a unitary axiomatic; looks for the problem which is implicit in a certain relation of ideas such as the discrete and the continuum, the local and the global, etc. This speculative dialectic, inspired by Plato's method of division rather than by Aristotle's search of the genus, is an art of constructing ideal problems as structures which are apt to generate new objects. (Longo, 2017)

This speculative dialectic engenders a process in an interrogative register which seeks precisely by not knowing exactly what it is seeking – hence, abduction! – for the sake of generation, of the difference that makes a difference. The secret of the ground, of the transcendental, is that it is immanently *self-grounded*, such that thought depends on thinking, the transcendental on the historical, and provocatively, geometry itself on its being re-made in mathematical and scientific theory and practice. If scientific revolutions have excoriated dogmatic images of geometry and embarrassed and alienated the manifest image of the human in turn, this does not outlaw the kernel of truth that antiquated theories carry, in that they were abducted at an

historical juncture which *afforded* a particular manner – read: style, "*How?*" – of genetic explanation. As René Thom opines: "[...] I am certain that the human mind would not be fully satisfied with a universe in which all phenomena were governed by a mathematical process that was coherent but totally abstract. Are we not then in wonderland?" (Thom, 1989, p. 5) He continues:

In the situation where man is deprived of all possibility of intellectualization, that is, of interpreting geometrically a given process, either he will seek to *create*, despite everything, through suitable interpretations, an intuitive justification of the process, or he will sink into resigned incomprehension which habit will change to indifference. (Thom, 1989, p. 5, my emphasis)

In defense of a kind of convergent realism, I believe the history of reason teaches us that reason's own self-generation beseeches us to re-problematize the very geometry of thought again and again, so as, by fits and starts, by the very grasped relation between continuity and discontinuity, between stasis and rupture, to re-invent and transform our very own conditions of thought and of how we *can* and *ought to* understand the world. Without this synthetic ethos, the Scylla of idealism, rationalism, transcendentalism, etc. and the Charybdis of materialism, empiricism, historicism, etc. turn away from each other, which is also to say they suffer mutual dilution and antinomization, and in flows ideology through the back door. Philosophy begs a reciprocal, oscillating, transitional method in order to confound and rewire sedimented dualisms, enjoining "a stereoscopic co-deployment of the mediating vectors that operate within the different spectral sections of the absolute" (Catren, 2011, p. 349). Philosophy then would be this imperative to think the third site, for and from the genetic hinge, for the sake of making the contingent necessary by creative abstraction from an abduction to thought. When it comes to genetic *forms of thought*, a veritable dialectical geometry of thought, we'd do well to remember that we haven't seen anything yet.

Data availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Received: 31 August 2022; Accepted: 6 September 2023;

Published online: 23 September 2023

Note

1 I'm thinking of various philosophical projects such as those of Ray Brassier, Reza Negarestani, Gabriel Catren, Daniel Saccilotto, Nathan Brown, Anna Longo, Peter Wolfendale, and others.

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Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

Informed consent

This article does not contain any studies with human participants performed by any of the authors.

Competing interests

The authors declare no competing interests.

Additional information

Correspondence and requests for materials should be addressed to Will Fraser.

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