

Eleven Theses for An Initial Degree of Roughness for Transubstantiation, Materiality and Art

Mattia Paganelli and Dane Worrallo

Thesis 1. No aesthetic theory, practice, let alone its critique, would be possible without taking as a starting point an *initial degree of roughness*. This is a move entirely different from the binaric (zero-sum) true/false statements of logic, generalizations of inductivism, or what seems to emerge from the expectations of a 'scientific' observations of events.¹

Thesis 2. After the crisis of foundations of the last century, networks and digital transformations renew the challenge to ontology. Emphasizing once again that the very ground upon which realities emerge (virtual, artificial, augmented, real) is better addressed as 'surfaces' (immediately emerging in the plural), 'sensuous or libidinal economies', folds or dimensions, organizations that do not point to a whole. The question thus becomes one of *how* to inhabit sense as a regime, or logic of incompleteness, which no longer relies on identity as its principle, but evolves precisely because it is unbound; a dynamic form of consistency that *grows* rather than being established a priori.

Thesis 3. With and beyond Kant, the intertwining of phenomena and expression also rings true for contemporary scientific (physics/meta-mathematics) enquiry. Perhaps it is

¹ Expectations are of course legitimate, and yet highly problematic when a filter of 'objectivity' is first applied to an epistemological model and then (conveniently) forgot, made transparent, and concealed. The rationality behind the STEM approach, for instance, as a model of research and knowledge, introduces guidelines for the production of thought geared toward an ever-objective structure, well distinct from the object it intends to measure; this is not only without regard for the work of art or its material practices, or sensuousness in general, but actively colonizes their practices as territories without a language of their own. In contrast with this attitude, Isabelle Stengers' reformulation of the problem of knowledge is enlightening and refreshing. She indicates that a model and its measuring tools are not providing objectivity, but should instead be adopted as a useful platform for raising and discussing objections. Popper's argument about inductivism and conjectures, and the selective process that supports the validity of scientific theory or cohesion in general come to mind. Equally the necessary constraint (roughness indeed) that Mandelbrot discovered in fractal iterations, and the 'natural interpretations' that Feyerabend emphasizes are both inevitable and necessary for a fruitful scientific research contribute to the formulation of this concept. All indicating that it is precisely some degree of opacity, of problematization, rather than the transparency of idealized objectivity, that permits both the process of knowledge and the production - be it of objects, art, or sense- to take place. See respectively: Isabelle Stengers *Cosmopolitics I & II*, trans. Robert Bononno (Minneapolis: University of Minnesota Press, 2010) where this theme is developed, and her lecture "Provocations of Gaia" <http://www.nottinghamcontemporary.org/event/isabelle-stengers#field-field-vents-video>, accessed February 20, 2015; Karl Popper, "Conjectural Knowledge, My Solution to the Problem of Induction" and "Of Clouds and Clocks, An Approach to the Problem of Rationality and the Freedom of Man", both in *Objective Knowledge, An Evolutionary Approach* (Oxford: Oxford University Press, 1972), 1-31 and 206-255; see also Benoit Mandelbrot, "Chance as a Tool in Model making", in *The Fractal Geometry of Nature* (New York-San Francisco: Freeman and Company, 1983), 200-204; and Paul Feyerabend, *Against Method* (London-New York: Verso, 2010), 49-59.

appropriate to speak of both contemporary ‘art’ and ‘science’ knowledge-practices as embodying discourses not dissimilar to that of quantum mechanics; that is as an “entanglement” or shared existence; each being distinct, but affected by what the other does, and even more interestingly, contributing to the *emergence* of time and space (Kant’s *a priori*, which would seem not so unconditional after all).² Observation (indeed, *being present*) is a powerful tool; it does not just discover results or data, but here contributes to its very existence.

Thesis 4. If we are to assert that an *initial degree of roughness* grants us the means by which to begin the work of science and/or art, discovery and/or invention, then perhaps a lesson we can take from Kant is that we do not forego or leave it (this initial degree of roughness) behind when experience may smooth over the peaks and troughs of intuition and intensity or when said experience may try to reduce reason to a linear cause-effect historicity.³ Kant attests to reason’s distinction from understanding in its ability to think in a creative or non-linear manner. This finitude or roughness, as Heidegger puts it in light of Kant, is not to be abandoned, but “safeguarded”.⁴ In light of our initial roughness we can see the emergence of a *technē* of complexity, where finitude does not just exist as constitutive of a subject, but gives materiality to everything else in the universe as well (it is not something that can be “detached” by reason to find its unconditional metaphysical essence). But what sort of logic/epistemology/method/practice/regime – call it what you will – could accomplish this?

Thesis 5. In a non-ontological regime of emergence, matter is at once *univocal* and *radically other*. What has always been assumed as absolute foundation is revealed as epiphenomenon, a form of coherence whose synthesis is *a posteriori*, retroactive.⁵ Some

² See “Quantum Experiment Shows How Time ‘Emerges’ from Entanglement” (The Physics Arxiv Blog). Accessed January 25, 2015. <https://medium.com/the-physics-arxiv-blog/quantum-experiment-shows-how-time-emerges-from-entanglement-d5d3dc850933>. For the technically detailed article see: Ekaterina Moreva et al., “Time from Quantum Entanglement: An Experimental Illustration”, published October 17, 2013. Accessed January 25, 2015, <http://arxiv.org/pdf/1310.4691v1>

³ Cf. Immanuel Kant, *Critique of the Power of Judgment*, ed. Paul Guyer, trans. Paul Guyer & Eric Matthews (Cambridge: Cambridge University Press, 2010), 59-60

⁴ Martin Heidegger, *The Fundamental Concepts of Metaphysics* trans. William McNeill, Nicholas Walker (Bloomington/Indianapolis: Indiana University Press, 1995), 6.

⁵ With the notion of *plastic control*, for example, Popper links the progress of knowledge to the selective process of increasing consistency (evolution), a kind of consistent materiality or coherence. Interestingly, this position of Popper’s takes us quite close to Leibniz’s compossibility. For Leibniz there is still an external processor that selects (God as a *Deus ex Machina*), even if already inescapably submitted to logic, while for Popper judgment becomes disembodied from a singular figure and (re)embodied by the system in the entirety of its processes. See Karl Popper, *Of Clouds and Clocks*, 206-255; and Gottfried Wilhelm Leibniz, *Theodicy, Essays on the Goodness of God, the Freedom of Man and the Origin of Evil*, ed. Austin Farrer, trans. Eveleen M. Huggard (London: Routledge, 1996), 73-123; and “The Principles of nature and Grace Based on Reason”, in *Discourse of*

have named this “distributed representation,” where identity, instead of being concentrated on a pineal point, emerges from the multiple folding of the processes already active in a system and cannot be reduced to basic elements; integrability is possible but only at the cost of destroying it.⁶ In this progressive testing and including of possibilities, description coincides with history and non-linearity becomes the main trait of processes of emergence. Thus, temporality is intimately linked to judgment.

Thesis 6. The fallout from this temporal-judgment intimate dance produces an odd cathexis, what Prigogine and Stengers, in studying how entropy leads to the emergence of ever more complex organization, namely the concept of “active matter”.⁷ The internal fractal dimensions of such processes, and how the open process of emergence is a form of judgment *without concept*, emphasizes the poietic character of aesthetic judgment, while it also annihilates the distance between matter and representation. In this sense, shifting from representation to emergence could be called: the transubstantiation of logic. Materialism famously claimed to aim at changing the world rather than merely interpret it, yet this change is without absolute criteria and can follow only its internal contingent constraints.

Thesis 7: Our *initial* degree of roughness shows itself as *inherent* in any sufficiently powerful system. Building on claims 1-6, we turn to Kurt Gödel’s incompleteness theorems. As is well known, Gödel shows not only how a “synthetic” system will (necessarily) produce *undecidable* propositions, but also shows that whenever this undecidability can be “solved”, it again produces another undecidable proposition *ad infinitum*.⁸ Like prime numbers (Gödel’s “pattern” of choice), there is no analytically condensed formula for expressing such infinitude, therefore our reliance on algorithms and feedback becomes essential if we are to account for development and emergence without foreclosing the territory within which we are making, thinking and doing. While Gödel and Kant reveal “flaws” in totalities of empirical

Metaphysics and Other Writings, ed. Peter Loftson, trans. Robert Latta and George R. Montgomery (London: Broadview, 2012), 103-114.

⁶ The notion of “distributed representation” comes from the neurosciences field. See Paul Cilliers, *Complexity and Postmodernism, Understanding Complex Systems* (London: Routledge, 1998) 59-88; also John Holland, *Emergence, From Chaos to Order* (New York: Basic Books, 1998), 81-114, 188-201.

⁷ The chrono-logical irreversibility of events is the argument developed by Prigogine and Stengers in their early collaboration, moreover, this implies the mathematical impossibility of an external observer position at the base of the Newtonian model. See Ilya Prigogine and Isabelle Stengers, *Order out of Chaos, Man’s new Dialogue with Nature* (London: Harper-Collins, 1985), 286-290.

⁸ This is the crux of Gödel’s second incompleteness theorem. See Kurt Gödel, *On Formally Undecidable Propositions of Principia Mathematica and Related Systems*, trans. Brian Meltzer (New York: Dover Publications, 1992), 65. Gödel was well versed in Kantian philosophy, having read his work when he was sixteen years old, and the same age as one of his best friends in later life was reading Kant – Albert Einstein. See Pallo Yourgrau, *A World of Time: The Forgotten Legacy of Gödel and Einstein* (New York: Basic Books, 2005), 16.

thought or axiomatic methods, they are relegated to very specific instances, and are a small degree of roughness in a very complex but otherwise deterministic system, meaning they can be largely ignored.⁹ We are not looking to overcome traditional goals with traditional methods; rather, a whole new territory is taking shape based on this roughness, a kind of purposiveness without purpose of aesthetic judgment – a *cohesion without concept*- where aesthetic and judgment have to be indissoluble for givenness to give itself.

Thesis 8. For *cohesion without concept* to take place, the undecidability that Gödel exposes in the system must become dynamic; only in this way can incompleteness reveal it's radically other 'material' side and expose givenness as finitude.¹⁰ It is not enough to pass from the identity of being to the being of identity; multiple circulations and reciprocities must be allowed to take place simultaneously in order to explain the emergence of sense. Wittgenstein had already spread out the ontological root of the proper name into the relational surface generated by the correct application of rules/grammar (epistemology).¹¹ A dynamic interpretation of the transcendental would bring, to paraphrase Leibniz, God's operations on the level playing fields of the present – the compossibility game of multiple open series where *one* is the segment and *zero* an uninhabitable and meaningless smooth infinity.¹² Such incompleteness, beyond all postmodern abysses, reveals itself as 'positive.'

⁹ Gödel is relying on the argument made in *The Critique of Pure Reason*, but some of the *Critique of the Power of Judgment* also has some resonance – in particular the sections in which Kant differentiates teleology and decidability (§74 and §75). Not only does the faculty of understanding for Kant not account for the sensuous material of art, but other problems also pervade the faculty of judgment, which pursued to its limits will give rise to its own antimony (§70).

¹⁰ The 'givenness' of something (that a material can 'give', 'shift', 'stretch') always implies a degree of roughness, be it during scientific observation –as Feyerabend noted- or in the impossibility to separate matter/technology from what its history evokes when making/speaking of art. In fact, "natural interpretations" are common to primitive cosmologies as much as to scientific analysis. See Feyerabend, *Against Method*, 49-59. Leibniz had already found himself at this same crossroads when he placed God in a third position tangent on both the absolute and the contingent, implementing the laws of logic between the created monads, presented as finite sets/segments of information on the side of contingency, and actualized infinity on the side of substance; thus providing through selection that *initial degree of roughness* necessary to set the universe in motion. See Leibniz, *Theodicy*, 73-123; and "Monadology", in particular § 6, in *Discourse of Metaphysics and Other Writings*, 115-134. For a longer discussion on this point, see Gregory Chaitin, "Leibniz, Complexity and Incompleteness", http://videolectures.net/ephdcs08_chaitin_lcai/, last modified on Oct. 15, 2008, accessed on Jan. 28, 2015

¹¹ See Ludwig Wittgenstein, "The Proposition and its Sense", in *Philosophical Grammar*, ed. Rush Rhees, trans. Anthony Kenny (Berkeley: University of California Press, 2005), 39-196; and *Remarks on the Foundations of Mathematics*, eds. G.H. Wright and G.E.M. Anscombe, trans. G.E.M. Anscombe (Oxford: Basil Blackwell, 1978), 35-123.

¹² It is important to warn off the risk of confusion here and to distance our position from the interpretation of ontology reintroduced by Speculative Realism. The focus is precisely the finite dimensionality of the patterned segment, never sizing it with actualized infinity. Meillassoux's attempt to sever all correlations by reinstating an absolute object and with it the possibility of a non-human *sense*, which he identifies with pure possibility, is a sophisticated twist aiming only at the reintroduction of a priori necessity under the disguise of its absence. *Active* matter is not *conscious* matter, nor the product of a present other; rather it is an entirely different process whereby contingency generates necessity locally and retroactively. The concept of Zero and One as *infinity* and *segment*, rather than a simply binary yes/no, yet not coinciding with Deleuze's notions of virtual and actual, has been introduced by Golding; see Johnny Golding, "Fractal Philosophy, Trembling a Plane of Immanence and the

That is, transubstantiating from a notion of matter separated from its form/dimensions and representing meaning on the background of necessity, to *dimensionality*; a process of emergence that lies outside the teleology of a totality to be fulfilled, or the opposition of otherness to be reconciled, or of lack to be overcome. Positive incompleteness cannot and must not be approached, let alone solved, from inside undecidability as the paradox of linear thinking.

Thesis 9. Contemporary art practices (and theoretical immersions) require a radical *dis/position* from the paradigms gone before. The Kantian/Enlightenment pursuit of rationality as equivocal to ontology, makes logic and reason (no matter how flexible Kant envisioned it to be) always to lead to specific ends, teleologically justified or otherwise; and, in so doing always objectifies “sense” as the means to that end. Wittgenstein certainly had the right idea to counteract this epistemologically, and his objection to Turing’s notion of artificial intelligence is based on this.¹³ Similarly, Gödel’s challenge to Turing on this subject was that the human mind “evolves” and is dynamic, whereas Turing’s universal machine was just a universal “number cruncher”.¹⁴ It seems Gödel, Turing and Wittgenstein were all stretching themselves towards similar ideas, but disagreed on issues of ontology, infinite possibility, judgment and the production of truth (certainty). Then the radical *dis/position* is to (re-)consider time, as itself a singular materiality, whose singularity is irreversible, due to its being emergent from an entanglement that is not limited by physical nearness or distance, but is primarily self-organization.¹⁵ This temporal dimensionality is perhaps the only marker required with regard to the possibility and production of sense, which relies on a recursive foundational move, not one that is closed or deterministic (again reducing a system to mere cause and effect) or rooted in an uninterrogated *a priori*.

small matter of Learning How to Listen: Attunement as the Task of Art”, in *Deleuze and Contemporary Art*, eds. Stephen Sepke and Simon O’ Sullivan, (Edinburgh: Edinburgh University Press, 2010), 133-154; and her “Anamaterialism and the Pineal Eye: Becoming mouth-breast (or visual arts after Descartes, Bataille, Butler, Deleuze and Synchia with an ‘s’”, in *Philosophy of Photography* 3, no 1 (2012): 99-120.

¹³ For Wittgenstein’s and Turing’s various differences with regards to logic, mathematics and computation, see Ludwig Wittgenstein, *Lectures on the Foundations of Mathematics*, ed. Cora Diamond (Chicago/London: University of Chicago Press, 1976), 105-106, 109, 186-187, 218-220.

¹⁴ Rebecca Goldstein, *Incompleteness: The Proof and Paradox of Kurt Gödel* (New York/London: Atlas Books, 2005), 117-119. Wittgenstein only ever mentioned Gödel’s work on incompleteness on one or two occasions (Which can be found in the posthumously published *Lectures on the Foundation of Mathematics*), and he seems to never have quite understood its implications, referring to it as a mere “trick” or novelty of logic, as evidenced in Goldstein’s book that publishes an unsent letter from Gödel to his friend Karl Menger.

¹⁵ The temporal character of self-organization is the core of Prigogine and Stengers collaboration; see Prigogine and Stengers, *Order out of Chaos*. A theme that Stengers developed also in the second volume of *Cosmopolitics*, see Stengers, *Cosmopolitics II*; a parallel argument, shifting from discovery to invention is put forward by Wittgenstein, see Wittgenstein, *Remarks on the Foundation of Mathematics*, 168. See also Johnny Golding, “Ecce Homo Sexual: Eros and Ontology in the Age of Entanglement and Incompleteness,” *Parallax* 20, no 3 (2014): 217-230.

Thesis 10. The consistency or cohesion that presents itself is, in fact, all that is required to sustain an entangled relation of the emergence of givenness. There is no need for recourse to ontology, regardless of how much “possibility” or “freedom” is promised or attempted to be built into its Russell-esque scaffolding. If these traditional systems persevere, we may become trapped between (old-ish) postmodernism that nullifies any attempt at universal coherence/consistency and (new-ish) contemporary speculative trends that forfeit dimensionality to once again impress on us the significance of an object-oriented method, by which movement takes place once again in a hierarchical manner.¹⁶ The algorithm as instruction for the continuation of the series, rather than an exhaustive description of the whole expressed by the equation, is a strategy whose only prescription is to be tactical and local. That is, the instruction can only function adopting the present and the present’s organization as ground; thus the results of the last development become parameters for the new evolution of the system. Mandelbrot, named this form of recursiveness *self-constrained chance*.¹⁷ In this sense, the growth of consistency by fractal iterations is not different than the selection by testing compossibility proposed by Leibniz. As such the totality of infinity is never contemplated and only the present/local pattern is engaged, as the only information the process can implement. Such self-constraint, or finitude, engenders a *positive* limit. It provides that initial degree of roughness necessary for the algorithm to function and turns the present/pattern into a set of dimensions. This transubstantiation of logic retains the cohesion of sense and, at the same time, overcomes the mournful attitude that stems from the interpretation of the undecidability of entanglement that conflates it with pure difference; thus not dispelling a certain postmodern ambiguity that risks maintaining metaphysics by disguising Being with the paradox of its absence.¹⁸

Thesis 11. There is no need to build a system to “contain” undecidability, in order to bestow said system with *degrees* of freedom, or to derive it from axioms only to retroactively

¹⁶ An insistence on there being this object towards which we project our method or being, again impresses on us a very specific manner of movement through space, time and thought, and constructs a non-negotiability into them. This insistence on the existence of such an object forms a key part of the thought of Object-Oriented Ontology (OOO), often connected with the philosophical movement of speculative realism. For an overview of Object-Oriented Ontology see Graham Harman, *The Quadruple Object* (Winchester/Washington: Zero Books, 2011) and Quentin Meillassoux, *After Finitude, Essay on the Necessity of Contingency*, trans. Ray Brassier, (London: Continuum, 2009).

¹⁷ This recursive, or feedback loop process was formalized by Mandelbrot as the fractal iteration $Z \rightarrow Z^2 + C$. See Mandelbrot, *The Fractal Geometry of Nature*, 200-204.

¹⁸ The post-structuralist interpretation of Heidegger’s groundless ground tends to see all relations through a dualistic lens, which overemphasize the irreconcilability of otherness. This undeletable echo spans across authors as different as Agamben (dispositive, capture, naked life), Lyotard (discourse, figure), and Irigaray (proximity); extending all the way to Deleuze’s ontologization of differences into one pure foundational Difference.

undermine them; we are not looking at parts of a whole, but segments that are localized, but not constrained by a physical-spatial-temporal limit of measurement. It may be that entanglement offers emergence and a relation across immeasurable distances, but leaves wanting a more specific locality (a Heideggerian “nearing”), which is what holds a coherence and dimensionality together with the roughness and consistency that we have discussed.¹⁹ To forfeit these discussions to onto-philosophical systems, such as those that “produce” undecidability as a mere consequence do indeed create this sense of “lack” which generates an objective to fill or complete it. Arthur Kroker’s caution to the embracing of the de-centralised, discursive digital is that, while it empowers radical connectivity and possibility across non-linear trajectories unimpeded by physical restrictions, it also contributes to a radical resurgence of the religious ideological battleground, as a means to fix the “burden of undecidability” brought about by the will to technology.²⁰ In both this context and with the points discussed above, perhaps we must take the position that it is time to declare the century-long mourning period for the death of God announced by Nietzsche as well and truly over: To find truth in its telling and its difference, rather than as a sameness of ground, method or concept.

¹⁹ Technology, for Heidegger, is an overwhelming force that seeks to bring everything into availability instantaneously, placing everything in a “standing reserve” by which it can be accessed as a piece of equipment. The consequence of this however, is that such a move obliterates any notion of time, space and subsequently the possibility of relation. In this state, there can be no *technē*, as there is no space/time by which to gather or orient anything. Heidegger stresses the importance for a dwelling, in which things *as* things can produce a “nearing” and hence the possibility of forming relations. See Martin Heidegger, *Bremen and Freiburg Lectures: Insight Into That Which Is and Basic Principles of Thinking* (Bloomington/Indianapolis: Indiana University Press, 2012), 3-4

²⁰ Arthur Kroker, “Religion, Technology and Ideology” in *Critical Digital Studies* (Toronto: Toronto University Press, 2013), 398-407. This idea that a discursive, technological society separates us from “the real”, or is antithetical to an authentic and unifying existence must be overcome if we are to break the urge to seek meaning and value in onto-theological absolutes.