



Delft University of Technology

Document Version

Final published version

Licence

CC BY

Citation (APA)

Radman, A. (2022). How to Fold Uncanny Valleys into Habitable Mountains. In G. Leoni, & C. Hein (Eds.), *The Ecological Turn: Design, Architecture and Aesthetics beyond 'Anthropocene'* (pp. 106-120). (CPCL Series PHD). University of Bologna.

Important note

To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright

In case the licence states "Dutch Copyright Act (Article 25fa)", this publication was made available Green Open Access via the TU Delft Institutional Repository pursuant to Dutch Copyright Act (Article 25fa, the Taverne amendment). This provision does not affect copyright ownership.
Unless copyright is transferred by contract or statute, it remains with the copyright holder.

Sharing and reuse

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

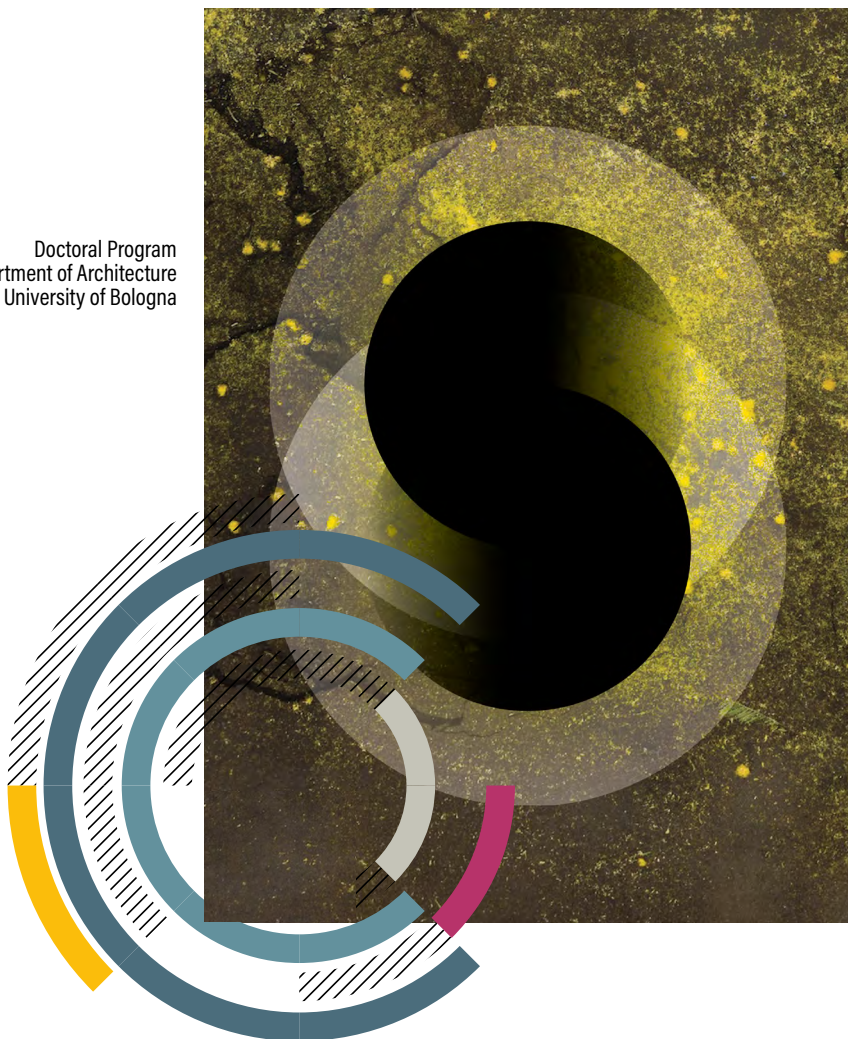
Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

This work is downloaded from Delft University of Technology.

The Ecological Turn

Design, architecture and aesthetics
beyond "Anthropocene"

Doctoral Program
Department of Architecture
University of Bologna





ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DIPARTIMENTO DI ARCHITETTURA
DIPARTIMENTO DI ECCELLENZA MIUR
(L. 232 DEL 1/12/2016)

CPC L  SERIES PHD

ISBN 9789463662741

Doctoral Program
Department of Architecture
University of Bologna

* Cover: Photo by Vicotr Malyushev on Unspalsh

S.01

ECO-POLITICAL
NARRATIVE
DIVERSIFICATION

HOW TO FOLD UNCANNY VALLEYS INTO INHABITABLE MOUNTAINS

Affect; Ethico-aesthetics; Ethology; Sensibilia; Territory.

Andrej, Radman

Delft University of Technology, The Netherlands
a.radman@tudelft.nl

The chapter is devoted to an ecological work of art; the proof that senses, inventions and worlds are not to be considered in isolation. It examines the process of folding an 'uncanny valley' into an 'inhabitable mountain' across seven points. First: *Amor fati*, the Nietzschean call to be worthy of what happens to us. Second: Decoding and Reterritorialisation, the emergence of sensibilia as expressive features. Third: Superjects and Objectiles, the primacy/exteriority of relations. Fourth: Isomorphism without Resemblance, the vital asymmetry between the virtual capacities and actual properties. Fifth: Schizoanalysis, the non-entailment of material inference, a.k.a. abduction. Sixth: Mutation of Boundary Conditions, the downward causation of enabling constraints. Seventh: Geology of Morals, recasting ethics as a problem of power, not duty. To quote Le Clézio, "Perhaps one day we will know that there wasn't any art but only medicine."



Introduction: Epiphylogenesis

The chapter draws a cartography that no longer considers technology and culture as being apart. Technicity as a mode of existence circumvents the myopic fixation on invariant properties and functional attributes in favour of an ethological double bind between ‘environ’ and ‘mentalities’.¹ The goal is not to rediscover the eternal or the universal, but to find the singular conditions under which something new is produced.² The Nietzschean ‘plastic principle’ stipulates that the condition is not to be wider than the conditioned.³ From such a ‘superior empiricist’ perspective, the Ecological Turn aims not at stating the conditions of knowledge qua representation – conditions of possibility – but at finding and fostering the *real* conditions of creative production. The injunction is: bring into existence, do not judge.⁴ The problem with judgment is that it perpetu-

1 Hélène Frichot, *Creative Ecologies: Theorizing the practice of architecture* (London and New York: Bloomsbury Visual Arts, 2019), 29.

2 Hanjo Berressem, *Félix Guattari’s Schizoanalytic Cartographies* (Edinburgh: Edinburgh University Press, 2020), 221.

3 Gilles Deleuze, *Nietzsche and Philosophy*, trans. Hugh Tomlinson (New York: Columbia University Press, 2006), 50.

4 Gilles Deleuze, *Essays Critical and Clinical*, trans. Daniel W. Smith and Michael A. Greco (Minneapolis: University of Minnesota Press, 1997), 135.

Fig. 1

Habitan Esas Laderas,
silicone © 2019 Flora
Reznik

ates the status quo and prevents the emergence of the new. By contrast, the anthropotechnical evolution – whereby the organic becomes dependent on the non-organic – ceaselessly creates new boundary conditions and, by the same token, new enabling constraints.⁵ Hence, new modes of existence, new forms of life.

The chapter is devoted to an installation by Flora Reznik, an Argentinian artist based in the Netherlands, titled *Habitan Esas Laderas / Change In Y, Change In X* (2019). The mixed media piece is based on the artist's sibling's medical condition. Her brother's leg had been developing at a slower rate of change from the rest of his body and had to be artificially extended. The result was a substantial scar, a consequence of multiple surgeries. The artist made a mold of the scar as a point of departure. Through a topological transformation of relief and scale, the scar became a mountain ridge (*laderas*). To address artificial and extended sensibility, she employed various tools like the contour serigraphy line maps, Google Earth-like images, silicone sculptures, a contraption that tracks the rising water, and a 3D animation. The *Unheimlich* was transformed into the *Heimlich*. In the words of Deleuze and Guattari:

If nature is like art [sic], this is always because it combines these two living elements in every way: House and Universe, Heimlich and Unheimlich, territory and deterritorialisation, finite melodic compounds and the great infinite plane of composition, the small and large refrain.⁶

5 Stiegler articulated three different forms of memory: *genetic* (programmed into our DNA); *epigenetic* (acquired during lifetime and stored in the central nervous system); and *epiphylogenetic* (embodied in machinic systems such as architecture). See: Bernard Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford, CA: Stanford University Press, 1988).

6 Gilles Deleuze and Félix Guattari, *What Is Philosophy?*, trans. Hugh Tomlinson (New York: Columbia University Press, 1994), 186.

Amor Fati

In the words of the artist's brother, his whole being is the answer.⁷ According to the poet Bousquet, the brother's scar had existed before him, he was born to embody it.⁸ In spite of its high specificity, *Habitan Esas Laderas* is not to be mistaken for an (auto)biographical work of art. It requires the affirmation not only of one's entire life, but every past event implicated in the aleatory moment leading to the scar.⁹ Psychosocial types may belong to history, but aesthetic figures belong to becoming, as a result of geography rather than historiography.¹⁰ Furthermore, by moving from interpretation to experimentation, and thus rethinking the issue of production without reproduction, the artist's ambition is to rethink our ethology.¹¹ Ethics = Ethology.¹² Her audience does not come ready-made either. The piece makes it: "One does not think without becoming something else."¹³

Decoding and Deterritorialisation

In the realm of architecture, it was Antoni Gaudí who cherished heuristics over hermeneutics. To think is to experiment.¹⁴ Through experimentation with models made of strings with small weights hung from a ceiling he discovered a way to transform traditional masonry techniques.¹⁵ The resulting catenary

7 An excerpt from the conversation between the artist and her brother: <https://www.florareznik.com/#/change-in-y-change-in-x>

8 Deleuze and Guattari, *What Is Philosophy?*, 159.

9 John Sellars, "An Ethics of the Event: Deleuze's Stoicism", *ANGELAKI Journal of the theoretical humanities* 3 (2006): 157–71.

10 Deleuze and Guattari, *What Is Philosophy?*, 96–97.

11 Anne Sauvagnargues, "The Wasp and the Orchid: On Multiplicities and Becomology" in *Aberrant Nuptials: Deleuze and Artistic Research* 2, ed. Paulo de Assis and Paolo Giudici (Leuven: Leuven University Press, 2019), 177–81.

12 Gilles Deleuze, *Spinoza, Practical Philosophy*, trans. Robert Hurley (San Francisco: City Lights Books, 1988), 17–29.

13 Deleuze and Guattari, *What Is Philosophy?*, 42, 176.

14 *Ibid.*, 111.

15 Mark Goulthorpe, *Gaudí's Hanging Presence in The Possibility of (an) Architecture...* (London and New York: Routledge, 2008), 85–8.

curve distributes the load in pure tension. When the model is flipped vertically, the load becomes compressive and thus optimal for a complex but structurally sound arch. In the case of Reznik's piece, the uncanny valley is turned from a microscopic concave to a telescopic convex and thus transformed into a *Heimlich* territory. The territory implies the emergence of sensibilia that become expressive features before any new causalities and finalities can be extracted from them.¹⁶ In the Neo-Lamarckian words of Elisabeth Grosz:

Territory is produced, made possible, when something, some property or quality, can be detached from its place within a regime of natural selection and made to have a life of its own, to resonate, just for itself.¹⁷

Superjects and Objectiles

The change in the abscissa 'X', indicating the degree of anthropomorphism, is not linearly proportional to the change in the ordinate 'Y', which traces the positive visceral response or likeability. The dip in the diagram may be qualified as the 'uncanny valley', evoking the strangely familiar feeling of eeriness and revulsion.¹⁸ It is often difficult to figure out where exactly the material ends and sensation begins, a zone of indetermination.¹⁹ We have to bear in mind that there is no such thing as the fully constituted subject supposedly acting on the fully constituted object. Subjects and objects are only ever derivative. As counterintuitive as it may sound, relation is prior to its terms.²⁰ Brian

16 Deleuze and Guattari, *What Is Philosophy?*, 183–4.

17 Elisabeth Grosz, *Chaos, Territory, Art: Deleuze and the Framing of the Earth* (New York: Columbia University Press, 2008), 69.

18 I have generalised the concept of the uncanny valley. In its original (narrow) sense, it is defined as a hypothesised relationship between the degree of an object's resemblance to a human being and the emotional response to such an object. https://en.wikipedia.org/wiki/Uncanny_valley

19 Deleuze and Guattari, *What Is Philosophy?*, 166.

20 Gilles Deleuze and Claire Parnet, *Dialogues*, trans. Hugh Tomlinson and Barbara Habberjam (New York: Columbia University Press, 1987), 41–42, 65.

Massumi explains:

It is only because relation is virtual that there is any freedom or creativity in the world. If formations were in actual causal connection, how they effectively connect would be completely determined. They might interact, but they would not creatively relate. *There would be no gap in the chain of connection for anything new to emerge from and pass contagiously across. There'd be no margin of creative indeterminacy. No wriggle room.* Or to borrow Whitehead's expression, there'd be no 'elbow room' in the world.²¹

Isomorphism without Resemblance

The possible is opposed to the real, whereas the virtual *is* fully real albeit incorporeal.²² Moreover, the possible is but retroactively hypostasised (the abstract made in the image of the concrete). In contrast, every quality of experience exceeds its empirical conditions because the virtual does not resemble the actual.²³ Concretion takes place by difference, *not* representation. As Michel Serres put it: "The world [...] is not the product of my representation; my knowledge, on the contrary, is a product of the world in the process of becoming. Things themselves choose, exclude, meet, and give rise to one another."²⁴ Given that the actual terms never resemble the singularities they incarnate,

21 Brian Massumi, "The Thinking-Feeling of What Happens" in *Interact or Die*, ed. Joke Brouwer and Arjen Mulder (Rotterdam: V2 Pub./NAi, 2007), 70–91 (84) [emphases added]. By contrast to virtual relations, 'algorithmic governmentality' is about optimising the current state of affairs (actual occasions). See: Antoinette Rouvroy, "Algorithmic Governmentality and the Death of Politics," *Green European Journal* (2020), <<https://www.greeneuropeanjournal.eu/algorithmic-governmentality-and-the-death-of-politics/>>, [accessed 15 January 2021].

22 Elizabeth Grosz, *The Incorporeal: Ontology, Ethics, and the Limits of Materialism* (New York: Columbia University Press, 2018).

23 Brian Massumi, "Virtual Ecology and the Question of Value" in *General Ecology: The New Ecological Paradigm*, ed. Erich Hörl with James Burton (London and New York: Bloomsbury Academic, 2017), 345–73 (349).

24 Ilya Prigogine, Isabelle Stengers and Serge Pahaut, "Dynamics from Leibniz to Lucretius", Afterword to Michel Serres in *Hermes: Literature Science, Philosophy* (Baltimore: Johns Hopkins University Press, 1982), 137–55.

individualisations are always genuine creations.²⁵ So are faces and landscapes, “from dermis to earth”.²⁶ Deleuze and Guattari:

The event is not the state of affairs. It is actualised in a state of affairs, in a body, in a lived, but it has a shadowy and secret part that is continually subtracted from or added to its actualisation: in contrast with the state of affairs, it neither begins nor ends but has gained or kept the infinite movement to which it gives consistency.²⁷

Schizoanalysis

Aptly, Reznik’s surname is derived from the Czech word ‘řezník’ (one who cut and sold meat, a butcher), or in Yiddish, ‘reznik’ (borrowed from Slavic languages, meaning Jewish ritual slaughterer). It brings to mind Karan Barad’s ‘agential realism’, whereby the only viable way of finding one’s bearings in the real is to cut into its causal fabric:

I propose “agential realism” as an epistemological-ontological-ethical framework that provides an understanding of the role of human and nonhuman, material and discursive, and natural and cultural factors in scientific and other social-material practices, thereby moving such considerations beyond the well-worn debates that pit constructivism against realism, agency against structure, and idealism against materialism.²⁸

Rez = Schiz. This modus operandi goes under the name of ‘abduction’, the non-analysable and non-deducible material inference where the hands-on *what-if* attitude supersedes the

25 Deleuze and Guattari, *What Is Philosophy?*, 33.

26 Bernard Cache, *Earth Moves: the Furnishing of Territories* (Cambridge, MA: The MIT Press, 1995), 73.

27 Deleuze and Guattari, *What Is Philosophy?*, 156

28 Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007), 26.

logocentrism of *if-then*.²⁹ In the words of Hélène Frichot:

Moving in a slow experimental manner amidst things, making surprising discoveries here and there, commencing to formulate what are still inadequate ideas, building on these ideas, for instance, by coming together with others to share concept-tools.

She continues to describe the cascade from inadequate ideas to common notions:

Forming common notions, making something that is sufficiently durable and might be shared, passivity slowly transforms into activity and greater liberty when it comes to one's material and sense-making compositions.³⁰

Consequently, what may appear as a conscious de-cision ('rez'), or circumscribed perception (snapshot), constitutes an abundance of complex duration, an autonomy of affect replete with potentials.³¹ Art in this sense creates the finite so as to restore the infinite. Neither art nor sensation has ever been representational.³²

Mutation of Boundary Conditions

Morphology is to the *a priori class* what *morphogenesis* is to the molecular notion of *mass*.³³ It is not about what happened (tracing), but about what is going on in what happens (cartography). All individuation is based upon movement and rest. Deleuze

29 Charles Sanders Peirce, "Abduction and Induction" in *Philosophical Writings of Peirce*, ed. Justus Buchler (New York: Dover, 1955), 302–305. Cf. Lorenzo Magnani, *Abductive Cognition: the Epistemological and Eco-Cognitive Dimensions of Hypothetical Reasoning* (Berlin Heidelberg: Springer-Verlag, 2009).

30 Frichot, *Creative Ecologies*, 213–14.

31 Andrej Radman, "Deep Architecture: An Ecology of Hetero-Affection" in *Architectural Affects after Deleuze and Guattari*, ed. Marko Jobst and Hélène Frichot (London: Routledge, 2020), 63–80.

32 Deleuze and Guattari, *What Is Philosophy?*, 193, 197.

33 Raymond Ruyer, *The Genesis of Living Forms*, trans. Jon Roffe and Nicholas B. de Weydenthal (London: Rowman and Littlefield International, 2020).

takes the distinction between speeds and slownesses from Spinoza.³⁴ From such a rhythmic perspective, it is intensities that constitute a body's capacities to affect and be affected, not to be confused with the movements across the Cartesian extensive space.³⁵ Affects thus remain irreducible to simple digits or units of computational code.³⁶ It gives primacy to the mutation of boundary conditions as the 'lure' of the virtual.³⁷ In the words of Didier Debaise:

It is as if the universe, in its creative advance, never ceases to create new constraints, which are the existents themselves, canalising how they inherit what is possible, in a new way.³⁸

Growth must tessellate space-time in non-Euclidean ways. If genetically the local epigenetic forces are not properly tuned to nonlocal constraints, as in the case of the artist's sibling, then they must be so tuned locally.³⁹ This is a matter of applying force on force, action upon action, and not force on object.⁴⁰ After all, the limit of something is the limit of its action and not the outline of its figure. In an anticipatory mode, a medical surgeon measures the effects of treatment against the desired objective, i.e. the boundary conditions to be conserved [Fig. 2].⁴¹

34 Gilles Deleuze, *Foucault*, trans. Sean Hand (Minneapolis and London: Minnesota University Press, 1988), 123.

35 Gilles Deleuze and Félix Guattari, *A Thousand Plateaus*, trans. Brian Massumi (London, New York: Continuum, 2004), 254, 261.

36 Peg Rawes, "Non-Human Architectural Ecologies" in *Graham Harman: Is there an Object-Oriented Architecture?*, ed. Joseph Bedford (London and New York: Bloomsbury, 2020), 111–40 (115).

37 Terrence Deacon, *Incomplete Nature: How mind emerged from matter* (New York and London: W.W. Norton & Company, 2012), 426.

38 Didier Debaise, *Nature as Event: The Lure of the Possible*, trans. Michael Halewood (Durham and London: Duke University Press, 2017), 66.

39 The epigenetic structure of inheritance and transmission is, as the very term suggests, external and non-biological.

40 Deleuze, *Foucault*, 28.

41 Peter N. Kugler and Robert E. Shaw, "Symmetry and Symmetry-Breaking in Thermodynamic and Epistemic Engines: A Coupling of First and Second Laws" in *Synergetics of Cognition* (Heidelberg: Springer-Verlag Berlin, 1990), 296–331, in particular Section 4: 'Perceptual Information as the Critical Set of Morphological and Growth Gradient Sets' (320–327).



Conclusion: Geology of Morals

In the final analysis there is actually – or better said virtually – an immanent ethics in *Habitan Esas Laderas*. It involves abstract machines and concrete rules.⁴² In other words, the virtualities as incorporeal effects, like Nietzsche's Will to Power, are also the quasi-causes.⁴³ They striate the real and, in so doing, produce enabling constraints. Truth and falsity are not values that exist outside the constitutive problematic fields that give them sense. As Rosi Braidotti argues, the enabling (active) power as potentia needs to be distinguished from the 'hindering' (reactive) power as potestas:

I do not think it acceptable [...] to raise any issues related to ethics or to morality independently of considerations of power and power relations. [...] At times contemporary moral

42 'Concrete Rules and Abstract Machines' is the title of the concluding chapter of *A Thousand Plateaus* (238–39).

43 Andrej Radman, "Involuntary Architecture: Unyoking Coherence from Congruence" in *Posthuman Ecologies: Complexity and Process after Deleuze*, ed. Rosi Braidotti and Simone Bignall (London: Rowman & Littlefield International, 2019), 61–86

Fig. 2

Habitan Esas Laderas,
silicone © 2019 Flora
Reznik

philosophy comes across as comfortably installed in a consensus about the *context-free* nature of its deliberations. As a materialist nomadic feminist philosopher, I want to stress the urgency of rewriting issues of power [...].⁴⁴

When pondering the issue of whether there can be a material ethics, one has to acknowledge that the source of critique cannot come by way of a transcendental intrusion.⁴⁵ It needs to operate at the level of production. The conditions of critique and creation collapse to debunk the genesis of thinking in thought itself: “Ask not what’s inside your head, rather what your head’s inside of.”⁴⁶ Ethics, framed in this way, is a problem of ‘response-ability’ or (degrees of) power, not duty.⁴⁷ One cannot *decide* to think differently. In order to think differently one has to *feel* differently.

The classical schism between the essence and the *appearance*, which gives way to the conjunctive couple of *sense/apparition* in Kant, is to be superseded by the *virtual/actual* coupling.⁴⁸ This two-sidedness, the simultaneous participation of the virtual in the actual and the actual in the virtual, as one arises from and returns to the other, is due to the capacity to affect and be affected. The process of individuation is thus only contingently necessary or quasi-deterministic. Reznik’s *Habitan Esas Laderas* provokes us into thinking-feeling that there is no object or

44 Rossi Braidotti, *Transpositions: On Nomadic Ethics* (Cambridge: Polity Press, 2006), 30.

45 Andrej Radman, “Double Bind: On Material Ethics” in *Schizoanalysis and Ecosophy: Reading Deleuze and Guattari*, ed. Constantin V. Boundas (London: Bloomsbury, 2018), 241–56.

46 William M. Mace, “James J. Gibson’s Strategy for Perceiving: Ask Not What’s Inside Your Head, but What Your Head’s Inside of” in *Perceiving, Acting and Knowing: Toward an Ecological Psychology*, ed. Robert Shaw and John Bransford (Hillsdale, NJ: Lawrence Erlbaum Associates, 1977), 43–65.

47 Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, NC: Duke University Press, 2016), 29.

48 According to Deleuze, Kant as the true champion of Phenomenology created completely new philosophical conceptual coordinates. The concept is no longer the essence of the thing, but the meaning of the apparition. What disappeared is the problem of creation, replaced by a completely different problem of founding (Romanticism). See: Gilles Deleuze, “Kant, Synthesis and Time”, Cours Vincennes (14 March 1978), <<https://www.webdeleuze.com/textes/66>>, [accessed 15 January 2021].

subject of movement separate from the movement, and that subject-object relations are effective 'illusions' arising from 'gaps' in movement. Herein lies perhaps the sole secret of the Ecological Turn: the world is but a relation of movements not excluding the movement-effect of stasis itself.

Bibliography

- Barad, Karen, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press, 2007.
- Berressem, Hanjo, *Félix Guattari's Schizoanalytic Cartographies*. Edinburgh: Edinburgh University Press, 2020.
- Braidotti, Rossi, *Transpositions: On Nomadic Ethics*. Cambridge: Polity Press, 2006.
- Cache, Bernard, *Earth Moves: the Furnishing of Territories*. Cambridge, MA: The MIT Press, 1995.
- Deacon, Terrence, *Incomplete Nature: How mind emerged from matter*. New York and London: W.W. Norton & Company, 2012.
- Debaise, Didier, *Nature as Event: The Lure of the Possible*, translated by Michael Halewood. Durham and London: Duke University Press, 2017.
- Deleuze Gilles, Spinoza, *Practical Philosophy*, translated by Robert Hurley. San Francisco: City Lights Books, 1988.
- Deleuze, Gilles and Guattari, Félix, *A Thousand Plateaus*, translated by Brian Massumi. London, New York: Continuum, 2004.
- Deleuze, Gilles and Guattari, Félix, *What Is Philosophy?*, translated by Hugh Tomlinson. New York: Columbia University Press, 1994.
- Deleuze, Gilles and Parnet, Claire, *Dialogues*, translated by Hugh Tomlinson and Barbara Habberjam. New York: Columbia University Press, 1987.
- Deleuze, Gilles, "Kant, Synthesis and Time", Cours Vincennes (14 March 1978), <<https://www.webdeleuze.com/textes/66>>, [accessed 15 January 2021].
- Deleuze, Gilles, *Essays Critical and Clinical*, translated by Daniel W. Smith and Michael A. Greco. Minneapolis: University of Minnesota Press, 1997.
- Deleuze, Gilles, *Foucault*, translated by Sean Hand. Minneapolis and London: Minnesota University Press, 1988.

- Deleuze, Gilles, *Nietzsche and Philosophy*, translated by Hugh Tomlinson. New York: Columbia University Press, 2006.
- Frichot, Hélène, *Creative Ecologies: Theorizing the Practice of Architecture*. London and New York: Bloomsbury Visual Arts, 2019.
- Goulthorpe, Mark, *Gaudi's Hanging Presence in the Possibility of (an) Architecture....* London and New York: Routledge, 2008.
- Grosz, Elizabeth, *Chaos, Territory, Art; Deleuze and the Framing of the Earth*. New York: Columbia University Press, 2008.
- Grosz, Elizabeth, *The Incorporeal: Ontology, Ethics, and the Limits of Materialism*. New York: Columbia University Press, 2018.
- Haraway, Donna, *Staying with the Trouble: Making Kin in the Chthulucene*. Durham, NC: Duke University Press, 2016.
- Kugler, Peter N. and Shaw, Robert E., "Symmetry and Symmetry-Breaking in Thermodynamic and Epistemic Engines: A Coupling of First and Second Laws" in *Synergetics of Cognition*. Heidelberg: Springer-Verlag Berlin, 1990.
- Mace, William M., "James J. Gibson's Strategy for Perceiving: Ask Not What's Inside Your Head, but What Your Head's Inside of" in *Perceiving, Acting and Knowing: Toward an Ecological Psychology*, edited by Robert Shaw and John Bransford. Hillsdale, NJ: Lawrence Erlbaum Associates, 1977.
- Magnani, Lorenzo, *Abductive Cognition: the Epistemological and Eco-Cognitive Dimensions of Hypothetical Reasoning*. Berlin Heidelberg: Springer-Verlag, 2009.
- Massumi, Brian, "The Thinking-Feeling of What Happens" in *Interact or Die*, edited by Joke Brouwer and Arjen Mulder. Rotterdam: V2 Pub./NAi, 2007.
- Massumi, Brian, "Virtual Ecology and the Question of Value" in *General Ecology: The New Ecological Paradigm*, edited by Erich Hörl with James Burton. London and New York: Bloomsbury Academic, 2017.
- Peirce, Charles Sanders, "Abduction and Induction" in *Philosophical Writings of Peirce*, edited by Justus Buchler. New York: Dover, 1955.

- Prigogine, Ilya, Stengers, Isabelle and Pahaut, Serge, "Dynamics from Leibniz to Lucretius," Afterword to Michel Serres in *Hermes: Literature Science, Philosophy*. Baltimore: Johns Hopkins University Press, 1982.
- Radman, Andrej, "Deep Architecture: An Ecology of Hetero-Affection" in *Architectural Affects after Deleuze and Guattari*, edited by Marko Jobst and Hélène Frichot. London: Routledge, 2020.
- Radman, Andrej, "Double Bind: On Material Ethics" in *Schizoanalysis and Ecosophy: Reading Deleuze and Guattari*, edited by Constantin V. Boundas. London: Bloomsbury, 2018.
- Radman, Andrej, "Involuntary Architecture: Unyoking Coherence from Congruence" in *Posthuman Ecologies: Complexity and Process after Deleuze*, edited by Rosi Braidotti and Simone Bignall. London: Rowman & Littlefield International, 2019.
- Rawes, Peg, "Non-Human Architectural Ecologies" in *Graham Harman: Is there an Object-Oriented Architecture?*, edited by Joseph Bedford. London and New York: Bloomsbury, 2020.
- Reznik, Flora, An excerpt from the conversation between the artist and her brother (2019),
<<https://www.florareznik.com/#/change-in-y-change-in-x/>>
- Rouvroy, Antoinette. "Algorithmic Governmentality and the Death of Politics," *Green European Journal* (2020), <<https://www.greeneuropejournal.eu/algorithmic-governmentality-and-the-death-of-politics/>>, [accessed 15 January 2021].
- Ruyer, Raymond, *The Genesis of Living Forms*, translated by Jon Roffe and Nicholas B. de Weydenthal. London: Rowman and Littlefield International, 2020.
- Sauvagnargues, Anne, "The Wasp and the Orchid: On Multiplicities and Becomology" in *Aberrant Nuptials: Deleuze and Artistic Research 2*, edited by Paulo de Assis and Paolo Giudici. Leuven: Leuven University Press, 2019.
- Sellars, John, "An Ethics of the Event: Deleuze's Stoicism," *ANGELAKI Journal of the Theoretical Humanities* 3 (2006): 157–71.
- Stiegler, Bernard, *Technics and Time, 1: The Fault of Epimetheus*, translated by Richard Beardsworth and George Collins. Stanford, CA: Stanford University Press, 1988.