An ecology of the limit and it's modulations

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Research plan for graduation project

Contents

1   Peter R Crane FRS, POMEGRANATE, 2006, Society of Botanical Artists, 2006, https://www.soc-botanical-artists.org/artist/margaret-fitzpatrick/fitzpatrick-margaret-pomegranate-2/.

To open the fruit is not to force it apart, but to engage in a delicate negotiation with its surface. One hand steadies the knife, the other turns the fruit slowly around its axis—a gesture of rotation rather than incision. The blade must not penetrate too deeply; it is not the interior we cut, but only the peel—the outer limit that holds the interior in place. The seeds, untouched, remain suspended in their individuating structure. Once the movement completes its circle, the fruit yields: already a halved pomegranate.

Opening move for auto-catalyst processes.

A fascination with modulation.

Modulation occurs within the pomegranate, and I am fascinated by the way its structure unfolds—its matter matters; form informs form. It is like a domino effect, not linear but rhizomatic, a network of affects that affect, produce, and reproduce territories—or rather, other affects. I call this modulation. Over time, there is a shift in the territory and its limits. It is modulation, not molding, because there is no mold. The field comes first, and the limits are constantly changing, unlike a cookie mold, where the limits define the field. It is modulation, not a product, because there is no finality. Instead, there is an infinitely individuating entity, a territory that is informed and thus forms, individuates, and evolves continuously, yet never reaches a fixed identity—at least, never becomes more or less itself.

While modulation concerns itself with an infinitely forming process that never reaches a fixed result, this research focuses on the limit. The limit is taken as the basis for studying its ecology. It fascinates because, although it is all we perceive, it is never fully there. Differences inform it: the seeds of a pomegranate can be counted only because there is a difference between the seed and its structure, and between the seeds themselves. Yet, as we approach the seed, the limit begins to blur. Getting closer to the seed attached to its structure is like zooming in on a blurred, infinitely pixelated image—one can always get closer, but the limit can never be localized.

When the limit is a compression of intensive differences within the field, and cannot be localized, why then should we focus on it, rather than on the field itself?

The relevance

The limit, the border, the category—these are operators within a binary logic of inside/outside. The binary distinctions of "what belongs to me" versus "what does not belong to me," "this" versus "that," "good" versus "bad" are taxonomies of othering that dominate, reinforcing colonial impositions of binary logic. These distinctions—through the fetishization of taxonomy and binary dialectics—attempt to "grasp" and code reality, simplifying it into static categories.[1] By discussing the limit within its ecology, and simultaneously exploring its non-existence as an object, this research challenges such binary logics. The ecologic and genetic episteme, as revealed through the pomegranate's modulation, offers an alternative way of understanding, one that resists the imposition of fixed categories and challenges the reduction of complexity into binary distinctions. This approach, rooted in the fluidity of processes, opposes the micro and macro colonial and fascist[2] practices built upon these binaries.

The problem

As architects in training, we are predominantly taught to operate "limits" (such as walls, roofs, shelves, doors, windows, etc.) as a means to modulate fields. For example, placing a wall in a certain position to control how people move from a large hall to a small waiting room is an instance of using the limit as an operator between different spaces. Challenging the limit as a static, finalizable object that predefines and codes fields allows us to question the very fundamentals of architectural design. Architecture, in this sense, becomes a technical solution to the tension between fields, formalizing a limit that is inherently temporary. Just as the structure of a nautilus shell showcases very clearly, both limits and fields are constantly changing, with patterns of growth reflecting the effects of modulation and adaptability. When architecture is viewed as an object that formalizes this modulation, it risks freezing these tensions into a static state—at one point in time and "forever." As such, architectural design, understood as an object, can come into conflict with the processes of individuation, which are by nature dynamic and evolving.

When juxtaposing architectural design praxis with the pomegranate: what if we transformed architectural design into an auto-catalytic and auto-genetic process? At what point, and for how long, does it remain architecture? The research is primarily guided by the study of the ecology of the modulation of the limit. And secondly, its is extended to the realm of the architectural design.

1   Tony Bennett, The Birth of the Museum: History, Theory, Politics (Culture: Policies and Politics) (Routledge Uuuu-Uuuu, 1995), 59–88.

2   Fascist in the way that Deleuze and Guattari put forward in their writings. Based on Focault Michel, Preface of Anti-Oedipus: Capitalism and Schizophrenia (Deleuze and Guattari) (1977; repr., New York: Penguin Books, 2009).

How is the limit modulated, and in its modulation, becomes affective as a modulator?
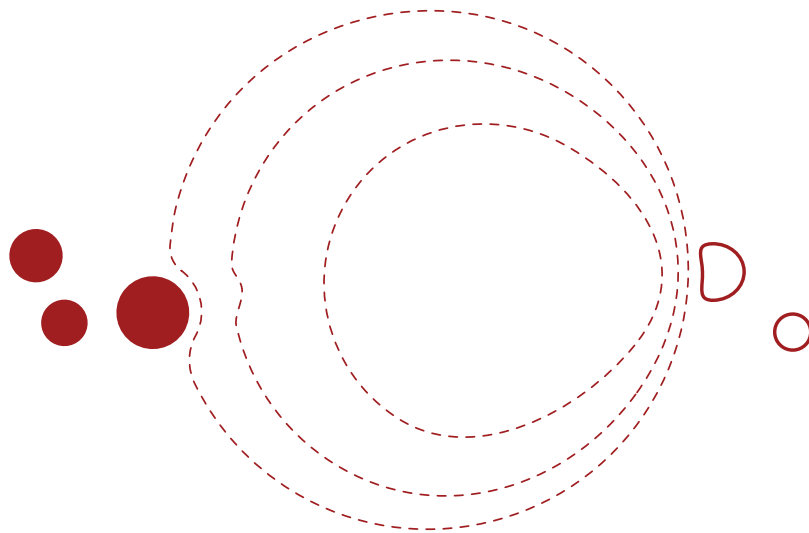
How do the various modes of modulation interact between the limit-field, limit-charge, and limit-flow? By whom and for whom? In what ways and at what intensities?

How is the modulation of the limit expressed within design processes?
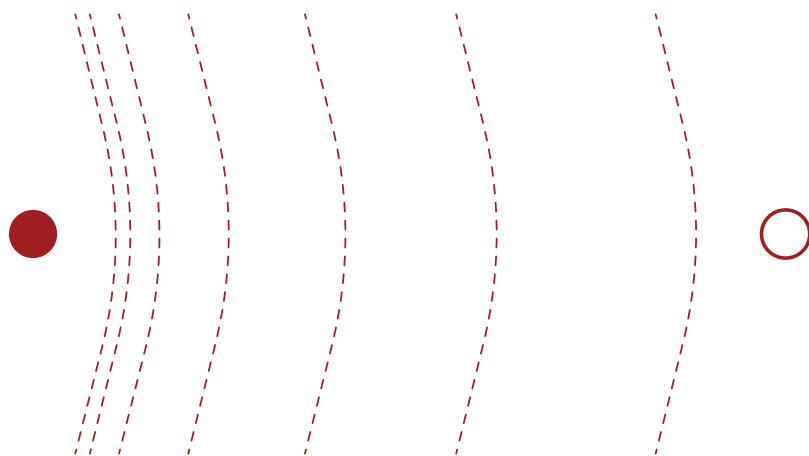
What are the limits in architectural design?

What if design (as agent) processes instead of it being projected, allowed to unfold dynamically, continually modulating?

Matter matters matter

Charged fields flow

An ecology of the limit.

A non-static and flow-based material framework.

The framework of this research is guided by a materialist and realist ontology, where matter matters and matter informs. This framework is informed by my reading of theories that I have studied in the past including theories of Gilbert Simondon, and Deleuze.

Particularly Simondon's notion of individuation, which posits that beings are not static entities but dynamic processes of becoming, constantly evolving through internalizations of information that forms[3]. Simondon's theory of individuating systems—rooted in information theory—frames the study of these processes as inherently ecological and cybernetic[4], where the essence of any individual or entity lies not in its isolated components but in the continuous communication with other components within a field of relationships.

The framework is also informed by Deluzian ideas of coding and stocking of flows[5]. Deleuze proposes that flows—whether of desire, information, or matter—are never neutral; they are shaped by their interactions with other flows and the systems they pass through. Coded by limits. "Stocking" refers to the accumulation of these flows, where they are stored, processed, and redistributed within systems, thereby modulating the limits of territories by being stocked in them. This conceptual framework is central to understanding how limits themselves are not fixed but are continually reshaped as flows move through them, constantly re-coding and re-defining them. The modulation of the limit, therefore, is not a one-time event but an ongoing process, continuously influenced by the flows that pass through and interact with it. It is, in addition, a relative process: the flow is coded and stocked but can be a limit that codes and stocks another flow.

Thus, the ecology of the limit, as I conceptualize it, requires a decomposition into parts that cannot be studied in isolation. These parts do not possess fixed, independent identities but only emerge through their operations with other parts. The essence of the limit lies in its relationality, its ability to modulate and be modulated by other forces within the field. This operation is always relative—changing in response to space, time, and the particular perspective from which it is observed. The limit is therefore not a rigid, fixed entity but a dynamic process of individuation, constantly in flux, and always relative to the flows that intersect with it.

The Problem Decomposed into Four Operators (or Modulators)

The problem is decomposed into four operators that could be visualized as a magnetic field.

Similar to the schizoanalytic cartographies outlined by Guattari[6], each of the four operators contributes to the problem of the modulation of the limit within the ecology of individuation by affecting each other. These operators are defined as follows:

The Limit

The limit functions as a coding and coded modulator (following Deleuze's notions of coding and stocking/becoming). It does not simply delineate a boundary, but, as an active modulator, it stocks flows while contemporaneously coding them. The limit cannot be localized, for it is not strictly differentiated from the field but is a more intensively differentiated region within it, a consequence of the encounter and resistance of flows. As the boundary of the field, the limit is susceptible to modulation in three distinct ways: through changes in permeability, thickness, and folding.

Permeability of the Limit

Permeability can be understood as the ratio between areas of resistance and areas of non-resistance within the limit. Where resistance is encountered, the limit is instantiated; where no resistance is present, flows pass through unimpeded, though they are still coded by the limit. Permeability, however, is relative to the flow: for some flows, the limit may exhibit higher

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3   Andrew Iliadis, "A NEW INDIVIDUATION: DELEUZE'S SIMONDON CONNECTION," MediaTropes EJournal IV, no. 1 (2013): 93–100.

4   Andrew Iliadis, "Informational Ontology: The Meaning of Gilbert Simondon's Concept of Individuation," Communication+1 2, no. 1 (September 2013): 9–18, https://scholarworks.umass.edu/home.

5   Daniel W. Smith, "Flow, Code and Stock: A Note on Deleuze's Political Philosophy," Deleuze Studies 5, no. supplement (December 2011): 36–55, https://doi.org/10.3366/dls.2011.0036.

6   Félix Guattari, Schizoanalytic Cartographies (London ; New York: Bloomsbury, 2013).

permeability, while for others it may present more resistance. For example, a windowed wall offers permeability to visible light but significantly less to UV rays, and ideally none to rain or wind. Thus, the permeability of the limit is a relational property, tied to the extent of interaction and exchange between the limit and the field it encloses.

Thickness of the Limit

The thickness of the limit refers to the extent of the compressed intensive differences within the field that define its boundary. While it might seem that thickness corresponds to the definition of the limit, when a wider limit is less defined than a thinner limit, this is not always the case: a thicker limit may be marked by a wide, clear delineation, and arise from a sudden compression of intensive differences, sharply differentiating the limit from the field. The increased thickness of a limit, however, can also blur the boundary, particularly when combined with increased permeability. For instance, a bench placed in front of a façade acts as a thickener of the limit—not belonging strictly to the interior or the exterior, it becomes a widening of the limit, creating an ambiguous transition between spaces.

Folding of the Limit

The folding of the limit pertains to the specific ways in which the limit inflects in terms of time, space, and intensity. It can be envisioned as a corner or a curve—structural shapes that signify the bending and reconfiguration of the limit. Just as the pomegranate exhibits curvature, a building's façade may fold inwards and outwards, creating varied spatial experiences and niches. In this way, the limit can be thought of as a paper that folds, modulating fields, shaping the territory within and around it. The fold gives form to the field, creating a dynamic, evolving topology.

The Pole

Though not explicitly discussed earlier, the pole is an implied but essential element within this ecology. When viewed through a magnetistic lens, the pole charges the field. An uncharged field is static and homogeneous, while a charged field becomes dynamic, generating flows that, in turn, modulate the limit. The pole itself cannot be localized—it is value-dependent and exists as an unlocalized difference. In the context of auto-catalysis, the pole becomes the subjective value that attaches itself to these differences. Like the limit, the pole can be understood and operated through variations in value, intensity, and location.

The Field

The field, in its essence, concerns the modulation of territorial balance. It seeks to maintain control over itself, negotiating with the "outside," modulating the limit in response to both internal and external forces. The field is coded and coding, just as the limit is, storing and directing flows and values, and actively interacting with the limit. The field is attuned to changes in its extension, globalization, and form, constantly adjusting in response to shifts in the environment.
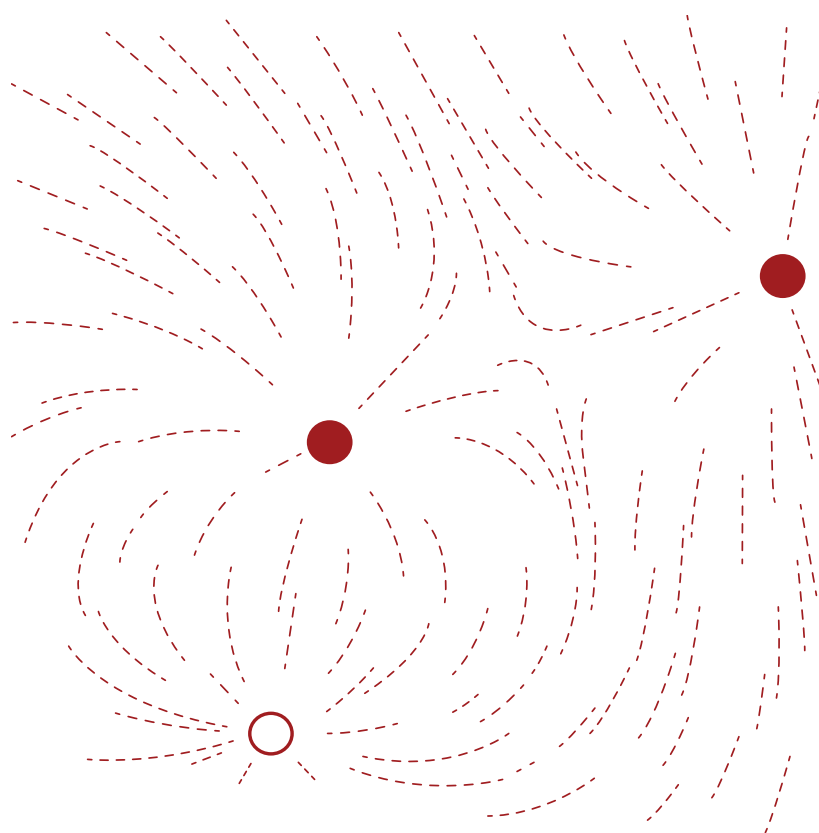
The Flow

Finally, the flow—serving as the counterpoint to the pole and a crucial element in the actualization of the limit—functions as the modulating force of the limit. The movement of flows and their encounters with other flows produce a resistance that shapes the limit. Resulting from the charge (not from the pole itself), the flow can be seen as the material fuel that drives modulation. A flow can be described and operated through its direction, force (understood as components of a vector), and duration. These operational properties combine to form a vector that is situated within the timespace of the system.
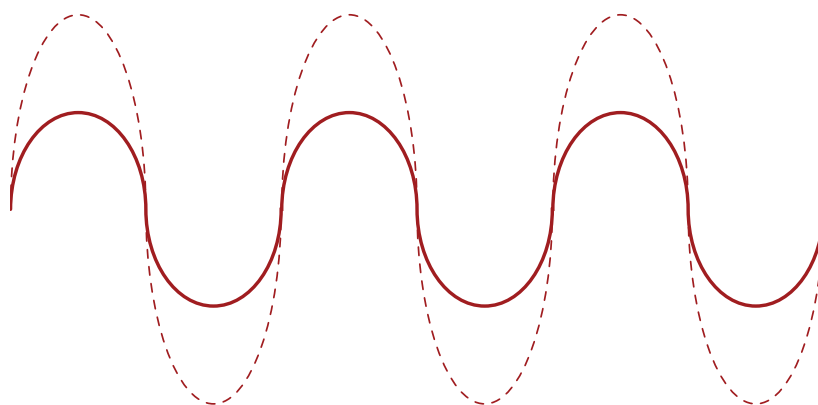
Relativity of the Elements

While the operational definitions of these elements—limit, pole, field, and flow—are presented in isolation, their functioning is inherently relative. As partial objects and machines, following Deleuze and Guattari's understanding[7], the elements both produce and are produced. The flow of nutrition within the pomegranate, for example, informs the field of the seed, which, in turn, stores protection and sustenance within its red limit. As the red limit grows and intensifies, it, along with the other seeds, becomes a flow of matter that modulates the greater limit of the pomegranate. This dynamic intensifies until it breaks the secondary limit—the peel—thereby initiating a flow of birds, insects, and perhaps even Eve, who come to consume the fruit.
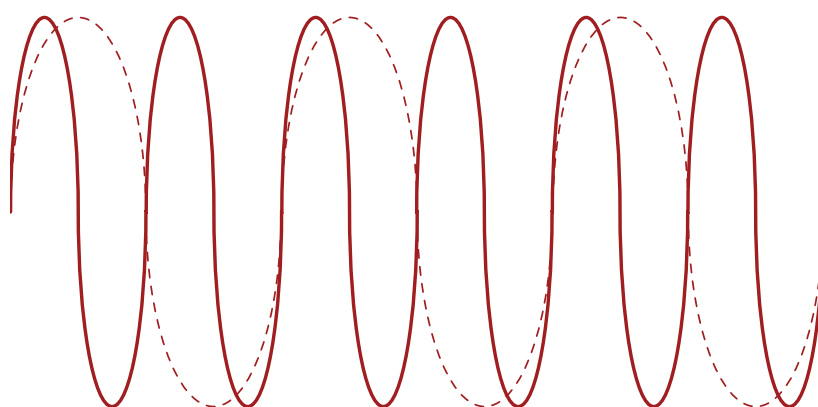
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7   Gilles Deleuze and Félix Guattari, Anti-Oedipus: Capitalism and Schizophrenia (2009; repr., Minneapolis: Penguin Books, 1977), 1–16.
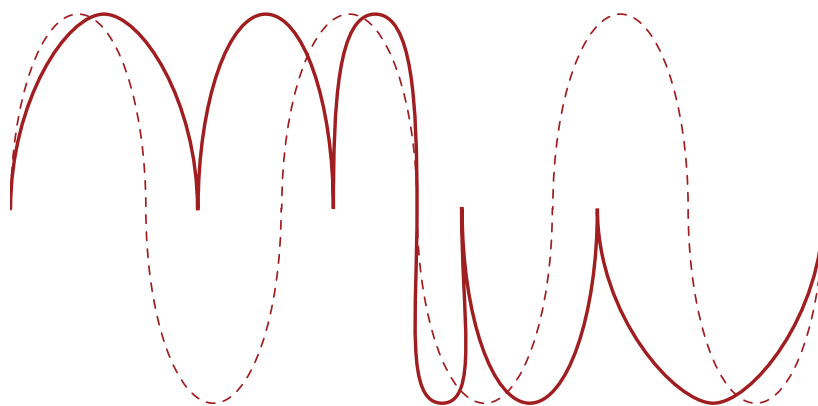
The problem

Modulating thicknesses

Modulating permeability

Modulating fold

Methodological Reflection

A non-systematized iterative process.

The methods in this research aim at an attunement with ecological processes more broadly, analyzed through the abstraction of limit, pole, field, and flow. These processes are primarily intuitively driven and remain non-systematized, departing from objectivity-seeking methodologies. They are modulated by the problem and modulate the problem in turn. The methodologies implied in this research are as follows:

Literature Review.

Ecological frameworks involving individuating operations have previously been explored by theorists working within information theory and materialist philosophy. Although the objective of this research is not to produce scientific objectivity or to identify "gaps" in knowledge, a literature review remains essential—not for validation, but as a source of inspiration, orientation, and attunement. The aim is not to challenge, affirm, or build upon a body of knowledge in the traditional sense, but to resonate with theoretical tools and modes of thinking that align with the concerns of this research. The review draws from theorists such as Simondon (on individuation and cybernetic systems), Deleuze (on the fold, difference, and repetition), DeLanda (on assemblages and processes of territorialization), Guattari (on schizoanalytic cartographies), Derrida (on surfaces), and Ruyer (on neofinalism).

Schizophrenic Analysis and Synthesis.

These paired methods aim to disassemble and reassemble the ecology of the limit. Following a spiral-loop dynamic, the methodology seeks to understand not only how modulation occurs but how modes of modulation interrelate across the different ecological elements. The limit's relation with the field will be studied in an iterative back-and-forth, as will the relations of limit-pole and limit-flow. By placing the limit at the center of the ecology, one can trace its operations without losing the relationality that defines it. Yet, in line with schizoanalytic thinking, shifting the center of analysis to the pole, the field, or the flow introduces new lenses and can result in alternative configurations of the ecology itself.

Observation, Abstraction, and Speculative Thinking.

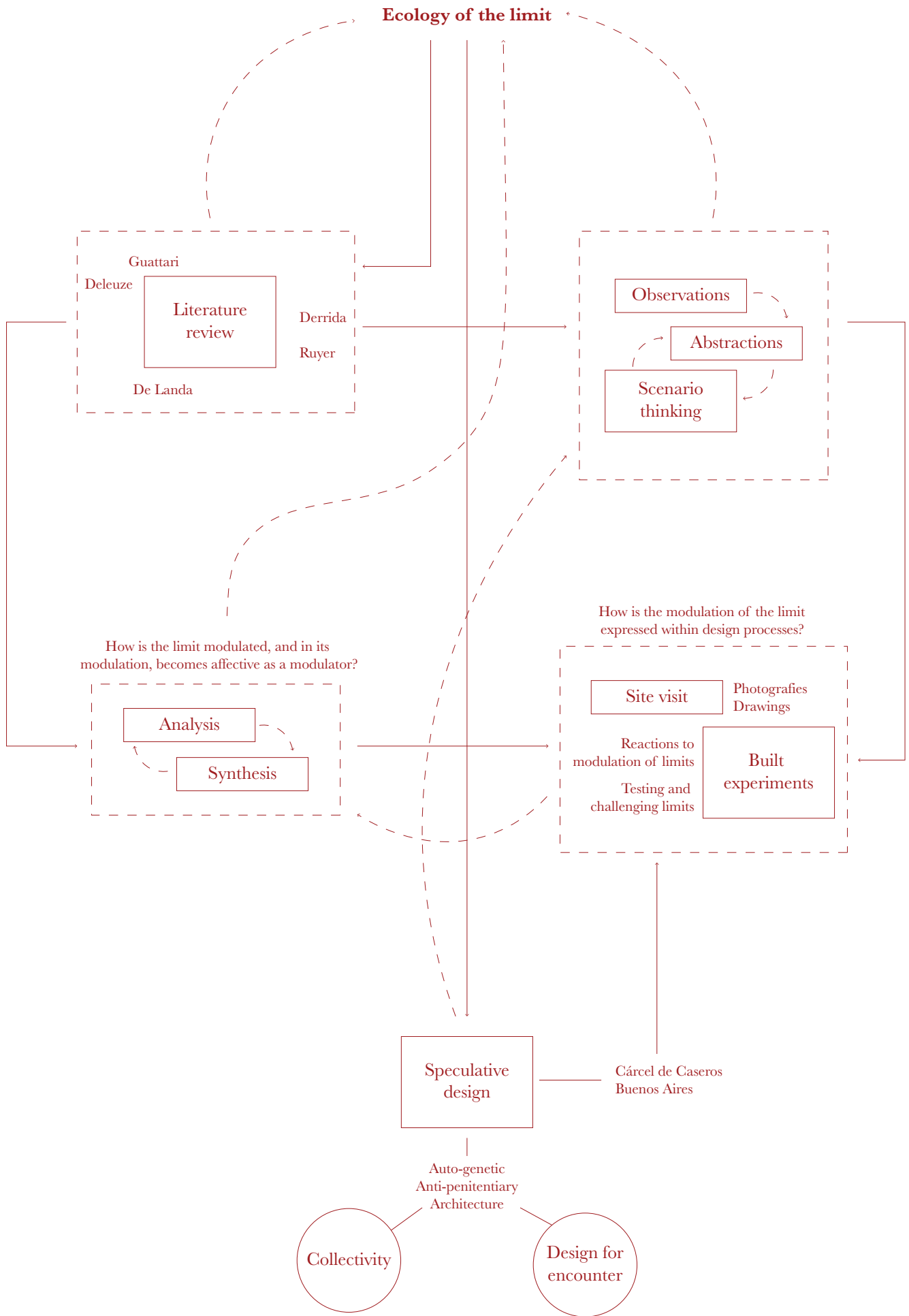From the moment I first opened a pomegranate, observation has functioned as a generative gesture in this research. Non-systematic observations—of birds' territorial modulations, of the way trees grow and leaves fall outside the window, of territorializing flows within the everyday environments I inhabit—continue to inspire abstractions that become operable within the ecology of the limit. Translating these observations into the vocabulary of limit, pole, field, and flow creates new operational relations and speculative propositions. Paired with scenario-thinking in a recursive methodology, these abstractions are placed back into imagined situations where they recombine.

Although these methods primarily take place as thought experiments, their results will be registered in the writing of a research paper focused on the ecology of the limit and the modulations that play out in it.

The research process will be iterative and non-linear, as the mothods not only inform their results and their own process but also the other methodologies, the problem statement and the questions.

A one-month site visit will be present as an intensive moment of observation through photographies and drawings and through recorded built experiments.

The linear loop of the research (continuous line) informs the experimantation phase; while the reworkings of the problem through this phase start a non-systematized but speculated feedback loop of re-methodologies, re-informing and re-attunement that will inform the speculative design process.

Ecology of the limit

Guattari

Deleuze

Literature
review

Derrida

Ruyer

De Landa

Observations

Abstractions

Scenario
thinking

How is the limit modulated, and in its
modulation, becomes affective as a modulator?

Analysis

Synthesis

How is the modulation of the limit
expressed within design processes?

Site visit

Photografies
Drawings

Reactions to
modulation of limits

Built
experiments

Testing and
challenging limits

Speculative
design

Cárcel de Caseros
Buenos Aires

Auto-genetic
Anti-penitentiary
Architecture

Collectivity

Design for
encounter

Cárcel de Caseros – An Auto-genetic Anti-penitentiary Architecture

How can research become an architectural project

Research in architecture can either be directly informative or fundamentally exploratory. The former, more akin to the engineering dimension of architecture, seeks to inform decisions related to material, form, performance, and functionality. The latter—fundamentally exploratory research—is instead aligned with philosophical inquiry, problematization, non-resolution, and intuitive experimentation. It does not aim to produce solutions but rather to unsettle, complicate, and open up new conceptual fields. An architectural project that emerges from such exploratory research is not driven by discrete pieces of information but is a process of enhanced attunement on the part of the researcher-designer. The architectural artifact becomes less a solution and more a crystallization of a problem.

The Cárcel de Caseros

The Cárcel de Caseros (Caseros Penitentiary), panopticon-style prison located in the neighborhood of Parque Patricios in Buenos Aires, has captivated my attention since childhood—its massive shell a constant visual and affective presence in the city. Originally constructed as the first prison for boys in Buenos Aires (who were previously incarcerated with adult men), it was later abandoned until the military dictatorship revived it in the 1960s as a political prison. After the return to democracy, it briefly housed high-profile inmates—including Jorge Rafael Videla, the head of the military junta—before being decommissioned in 2001.

Prisons operate as architectures of the disciplinary society and are interesting to the discussion of the limit in many ways. They embody the spatialization of exclusion: the externalization of those deemed non-compliant. In doing so, they become monads positioned outside the social body. Yet non-compliance, at the same time, expresses values that turn into limits that turn into a compossibility for non-compliance -values that may be democratically constructed or authoritarianly imposed. In either case, they give rise to juridical and architectural dispositifs that materialize as carceral structures.

Once abandoned, these architectures begin to disarticulate the limits they were constructed to enforce. Their emptiness can be expressed as a sort of demodulation, de-limitation— rigid codifications begin to erode. In this sense, abandoned prisons invite speculative architecting: the slow, auto-genetic formation of new configurations within the old shells.

Speculation on a project

The project of an auto-genetic anti-penitentiary architecture engages with this latent potential. It seeks to deterritorialize the binary taxonomies that underlie the disciplinary model—the limits of inclusion/exclusion, law/transgression, inside/outside. Through speculative design. The design might result in a series of staged informal appropriations and rearticulations of the Cárcel de Caseros. These stages interrogate and modulate the thresholds of what is allowed and disallowed; what is interior and exterior; what is democracy and what is its dictatorship; what is project and what is process; what is tolerated, and what falls outside the limits of tolerance within the complexity of Buenos Aires.

Maximiliano Luna, El Marginal, 2016, Photography, El Marginal, 2016, https://www.infobae.com/
sociedad/2019/05/03/la-carcel-de-caseros-hoy-entre-el-marginal-y-las-historias-que-sobreviven-en-las-paredes/.

Footnotes, images and consulted sources

1.   BibliographyBennett, Tony. The Birth of the Museum: History, Theory, Politics (Culture: Policies and Politics). Routledge Uuuu-Uuuu, 1995.

2.   Crane FRS, Peter R. POMEGRANATE. 2006. Society of Botanical Artists. https://www.soc-botanical-artists.org/artist/margaret-fitzpatrick/fitzpatrick-margaret-pomegranate-2/.

3.   D'arcy Wentworth Thompson. On Growth and Form, Vol. 1. Cambridge, Cambridge University Press, 1968.

4.   Deleuze, Gilles, and Félix Guattari. Anti-Oedipus: Capitalism and Schizophrenia. 2009. Reprint, Minneapolis: Penguin Books, 1977.

5.   Félix Guattari. Schizoanalytic Cartographies. London ; New York: Bloomsbury, 2013.

6.   Gilles Deleuze. The Fold: Leibniz and the Barroque. 6th ed. 1988. Reprint, London: University of Minnesota Press, 1993.

7.   Iliadis, Andrew. "A NEW INDIVIDUATION: DELEUZE'S SIMONDON CONNECTION." MediaTropes EJournal IV, no. 1 (2013): 93–100.

8.   ———. "Informational Ontology: The Meaning of Gilbert Simondon's Concept of Individuation." Communication+1 2, no. 1 (September 2013): 9–18. https://scholarworks.umass.edu/home.

9.   Luna, Maximiliano. El Marginal. 2016. Photography. El Marginal. https://www.infobae.com/sociedad/2019/05/03/la-carcel-de-caseros-hoy-entre-el-marginal-y-las-historias-que-sobreviven-en-las-paredes/.

10.   Michel, Focault. Preface of Anti-Oedipus: Capitalism and Schizophrenia (Deleuze and Guattari). 1977. Reprint, New York: Penguin Books, 2009.

11.   Smith, Daniel W. "Flow, Code and Stock: A Note on Deleuze's Political Philosophy." Deleuze Studies 5, no. supplement (December 2011): 36–55. https://doi.org/10.3366/dls.2011.0036.

12.   Tsing, Anna. "On Nonscalability: The Living World Is Not Amenable to Precision-Nested Scales." Common Knowledge 18, no. 3 (2012): 505–24. https://doi.org/10.1215/0961754X-1630424.