@t | Architecture Theory

Critical and Clinical Cartographies

International Conference Proceedings

Edited by Andrej Radman and Stavros Kousoulas

Contents

Preface

Embodiment and Technology and Care and Design

Andrej Radman and Stavros Kousoulas, editors

> The critical […] and the clinical […] may be destined to enter into a new relationship of mutual learning. […] In place of a dialectic which all too readily perceives the link between opposites, we should aim for a critical and clinical appraisal able to reveal the truly differential mechanisms as well as the artistic originalities. (Deleuze, 1967)[1]

Critical and Clinical Cartographies arises from a transdisciplinary conference organized by the Theory Section and Hyperbody of the TU Delft Architecture Department, in cooperation with the Bio Mechatronics and Bio Robotics Section of the Department of Bio Mechanical Engineering, TU Delft. [figs. 1-2]

The ambition of *Critical and Clinical Cartographies* is to rethink medical and design pedagogies in the context of both Affective and Digital Turns. The former designates a certain distancing from anthropocentrism, rethinking subjectivity and ethics in terms of 'inhuman' forces within the human, emphasising *heteropoiesis* as the organising power of transversal processes, and exploring the political ramifications of these processes for cultural practices such as architecture.[2] The latter marks the shift from the physical body to the concept of embodiment. Long after its impact on medical practices, digitalisation has been transforming the ecological, economic and aesthetic habits of the architectural *milieu*. It is imperative that architecture as the site of existence engages the non-manifest level of reality which in turn requires a non-anthropocentric frame of reference.[3]

The practice of cartography is employed for exploring relations between the body, and the machine technologies used in medical care and architectural design, in order to map the ever-shifting thresholds between the organic and the inorganic, the innate and the acquired. In short, a condition 'that is no wider than what it conditions, that changes itself with the conditioned and determines itself in each case along with what it determines.'[4] This is the cornerstone of the Deleuzian concept of *plasticity*. *Critical and Clinical Cartographies* gathers diverse cartographic experimentations which do not merely render the visible, but render visible.[5] They repudiate universals in favor of singularities and substitute the eternal for the discovery of the conditions under which morphogeneses occur. Causality gives way to non-linear determination.

The present volume affords the reader a chance to encounter diverse research trajectories in development. While emanating from different points of departure, they meet at multiple intersections forming a heterogeneous yet consistent assemblage. The virtual whole produced alongside its parts binds the concepts of *embodiment* and *technology* and *care* and *design* in the absence of any overarching or universalising tie.

Robert Gorny theorises the use of the clinical concept of *immunisation* when coupled with a revamped understanding of agency under the

Fig. 1: Critical and Clinical Cartographies Conference TU Delft 13-14 November 2014

Fig. 2: Critical and Clinical Cartographies Conference TU Delft 13-14 November 2014

theoretical framework of new-materialism(s), to account for the specific form of modernisation that the Parisian case of *interiorisation* provides.[6]

Dulmini Perera studies the distributed agential potential of self-organising systems emerging from cybernetic attempts to bridge looped organic life forms with mechanic elements. By doing so, she advances an epistemology able to enhance encounters between seemingly distanced realms – one of life and one of technology – underscoring their *logical* synchrony as contemporary design potential.[7]

Meeting the above arguments halfway, Katharina D. Martin introduces the concept of *milieu* as a tool for studying membrane tensions between the digital and the analogue. The intensive differential relations between the *inner* and *outer* are mapped on a physical body, the patient, as well as through digital techniques of augmentation where pathological, symptomatological, etiological and corporeal milieus intersect as affective hybridisations.[8]

Delving into transversal embodiments, Halbe Kuipers uses contemporary pop culture to examine aggressive schizophrenic-neurotic shifts through its affective openness. Examining different relationships of each state when posited in a milieu, Kuipers argues that their emergent affective sensitivity is paramount to their progressive differentiation.[9]

Finally, shifting from pathology to etiology, Arthur Waisblat questions the effects of traditional allopathic cures when compared with the emerging field of entheogenic approaches. Consequently, he contemplates the implications that such a shift would have on the spatial bodies that assemble the fragile milieu of clinical spaces.[10]

The Conference Proceedings, with its intricate entanglement of diverse contributions, constitutes cartography in its own right with an ambition to rethink the established theoretical frameworks.[11] It is now up to the reader to trace the emerging thresholds that their contingent co-existence creates, transducing them to an affective embodiment of spatiotemporal realities, modes of existence or ways of life.

Notes

1. Gilles Deleuze, 'Foreword' in *Coldness and Cruelty*, (New York: Zone Books, [1967] 1991), p. 14.
2. Félix Guattari, *The Three Ecologies* (London: Continuum, [1989] 2008), p. 51. 'Unlike Hegelian and Marxist dialectics, eco-logic no longer imposes a 'resolution' of opposites.' Cf. Félix Guattari, 'Machinic heterogenesis' in *Chaosmosis: An Ethico-aesthetic Paradigm* (Bloomington: Indiana University Press, 1995), pp. 36-7.
3. In his recent book on speculative realism, Steven Shaviro makes a similar case for the *detranscendentalisation* of phenomenological aboutness whereby 'intentionality becomes an implicit striving toward, or a potential for becoming, within the world, rather than being an underlying principle or structure of correlation.' See: Steven Shaviro, *Universe of Things: On Speculative Realism* (Minneapolis: University of Minnesota Press, 2014), p. 81. [Emphasis in the original.]
4. Gilles Deleuze, *Nietzsche and Philosophy* (New York: Columbia UP, [1962] 2006), p. 50.
5. Paul Klee, *On Modern Art* (London: Faber and Faber, 1924), p. 51.
6. Robert Gorny, 'The Immunization of Paris: Closing the Triptych of Modern Clichés for the Two-fold Matter of Form-taking' in this volume, pp. 7-24.
7. Dulmini Perera, 'Revisiting the U-Machine: Gordon Pask and Stafford Beer's Adaptive Controllers and Post-humanist Design Epistemologies (1955-1965)' in this volume, pp. 25-38.
8. Katharina D. Martin, 'Ecologies of the Corporeal Space' in this volume, pp. 39-50.
9. Halbe Kuipers, 'Delirious Impulses: A Logic of Erratic Excess in Harmony Korine's Spring Breakers' in this

volume, pp. 51-66.

10. Arthur Waisblat, 'The Architecture of Dreams: Towards a Transcendental Biopolitic of Addiction Care' in this volume, pp. 67-84.
11. The 3C Conference Proceedings is a precursor to the homonymous forthcoming book project: Andrej Radman and Heidi Sohn, eds., *Critical and Clinical Cartographies: Embodiment / Technology / Care / Design*, Rotterdam: nai010 Publishers.

Biographies

Andrej Radman has been teaching design and theory courses at TU Delft Faculty of Architecture since 2004. A graduate of the Zagreb School of Architecture in Croatia, he is a licensed architect and recipient of the Croatian Architects Association Annual Award for Housing Architecture in 2002. Radman received his Master's and Doctoral Degrees from TU Delft and joined Architecture Theory as Assistant Professor in 2008. He is on the editorial board of the TU Delft peer-reviewed journal for architecture theory *Footprint*. Radman is a member of the National Committee on Deleuze Scholarship.

Stavros Kousoulas studied Architecture at the National University of Athens where he received his first Master diploma in 2009. He received his second MSc in Architecture from the Faculty of Architecture of the TU-Delft in 2012. Since 2012 he has been involved in several academic activities at the Theory Section of the Faculty of Architecture of the TU-Delft. Currently, he is a PhD candidate at the Graduate School of the TU-Delft where he is developing his doctoral dissertation focusing primarily on morphogenetic processes framed within assemblage theory. He is on the editorial board of the TU Delft peer-reviewed journal for architecture theory *Footprint*.

The Immunization of Paris: Closing the Triptych of Modern Clichés for the Two-fold Matter of Form-taking

Robert Alexander Gorny

Introduction

Architecture has a long tradition to be thought in relation to the human body. But saying for example that architecture 'has a body' and a body 'has an architecture' historically separated forms from their internal relationships. Secondly, both are usually held as static things. Often falling back on reducing the (changes of) built environment to a representation of (a changing) social reality, this representational mode of thinking deteriorates problems of transformation, as for example the process of modernization. Against those representational models of thought the following paper will assume the built environment as explicitly *productive*. Poststructuralist thinkers have initiated a widespread refraction of these separate realms of bodies and relations, form and meaning, while connecting the processes how bodies *take form*, and how relations come to matter. More than tooling this concept of *morphogenesis* for architectural design, form-taking crucially affects architecture theory and history in its conceptualization of the formation of bodies and their ability to change.

In this line of thinking the essay approaches both architecture and humans *as* bodies, and reposes their changes as a matter of becoming. Such a post-human and new materialist take would theorize form-taking on the same plane of composition: Bodies, more than static delimited objects, are dynamic material configurations. Their material configurations constantly re-configure in performances describing all phenomena called life. Be it viral, human, architectural, political, or cosmic, all bodies manifest ecologies that constantly reconfigure matter (in the processing of matter organic and mineral compounds, liquids, solids and suspensions, signals and information) that *affords change.* In an environment that shapes forms of life that in return shape their environment, bodies 'change' in a two-fold adaption to, and *of,* a likewise changing environment.

However, this understanding is itself a modern product. Medical knowledge, problematizing the well-being of the human body, and the subsequent fields of biology and ecology developed in tandem with an emerging concern to make the city a healthy environment. The massed milieu of city's has historically often proven unstable, triggering pestilences and outbreaks of diverse kind. As an interface between the fields of care and design, clinic conceptions of the body gain increasing importance to understand, theorize and transform the city.[1]

Helpfully today, recent biomedical and ecological knowledge enables a different conception of these transformation processes in retrospect. In our post-anthropocene age, we finally recognize urban bodies as specific anthropogenic ecologies. Over modern times cities have proven to become the preferred human habitat. The modernization of the built environment can thus be rethought as a consolidation of novel ecological communities, and as a rather problematic one so. The growth and flux of modern times repeatedly challenged the biological homeostasis of

these communities, a situation that – more than a question of risk – is maybe best rendered in terms of *stress.*[2] Modern conditions triggered a significant response changing the physical structure of cities, transforming their medieval bodies into a metropolis configuration, while therewith transforming the life within.

Eventually, it was ecological thinking that challenged us to understand how change does not happen 'in' an environment. All that happens matters as a change 'of' environment. Unfortunately, architecture yet precisely lacks a reciprocal theorization on how its steady transformation of the built environment *matters* in return. The following is certainly only a first step searching for resonances between related theoretical accounts from ecology, biology, physics, and semiotics, to unfold the complexities entailed by such a perspective. The built environment is in fact both the territory, at once expression of modernization. This paper will theorize this double articulation from an ecosystemic perspective, in asking how the modern environment arranged the conditions for an urban form of life to take form. Concerned with modernization as a major phase of (self-) transformation, the following targets at architecture in two directions: first, in its relations to individuals; second in terms of its own individuation, i.e. its becoming-modern.

Inception: A Triptych of Clichés

The last century has composed a detailed clinical picture treating the metropolitan body. This symptomatology documents in numerous studies the technologies deployed in the reconstruction of its resource flows, its revolving modus operandi, and its unfamiliar appearance. In the prominent case of Paris studies rendered the becoming-modern of the city by giving attention to three different forms of modernizations, and to such an extent that they turned into clichés: [fig. 1]

1) In terms of the modern body, the most worn-out cliché of modernity might be Foucault's analyses of the spatial dispositive of containment at work in modern institutions and their cascading deployment towards a cellular organization of the build environment. Given the formal emphasis in the past discourse on his concept of biopolitics it seems indeed important to reemphasize the eco-systemic genealogy, which brought about Foucault's thinking through Canguilhem's philosophy of biology, Haeckel's concept of ecology as the study of 'conditions of existence', back to Virchow's multicellular theory of the state organism. From the organism to its cells, from the body to its milieu, what remains invaluable in this changing epistemology are Foucault's observations concerning the individuation of bodily and spatial formations, and their capacity of fabricating new forms of life. Authors started to elaborate on the wider entanglement between *Biopolitics and the Emergence of Modern Architecture* as for example Sven-Olov Wallenstein in his eponymous book, by detecting how architecture in its becoming-modern withdraws from symbolically representing a given order and discovers its potential to itself become a tool for ordering, and for shaping new forms of life.[3]

2) The life-sustaining circulatory systems of the city were for long addressed separately through the emerging frameworks of infrastructures and planning. Marking Haussmann's renovation as the second big cliché, studies charted the impact of restructuring the medieval city by means of specialized networks that channel and manage material flows. Cutting a long story short: infrastructure thinking gave us an intricate insight to disciplinary environments. It makes evident that 'containment' is less an issue of mere enclosure, but rather of engineering the flows of resources and desires that allows the city to grow and reproduce, to maintain their structures, and to respond to their environments. Infrastructures concretize how relationships are drawn and interdependencies are produced. Thinkers continue to liaise effectively with this

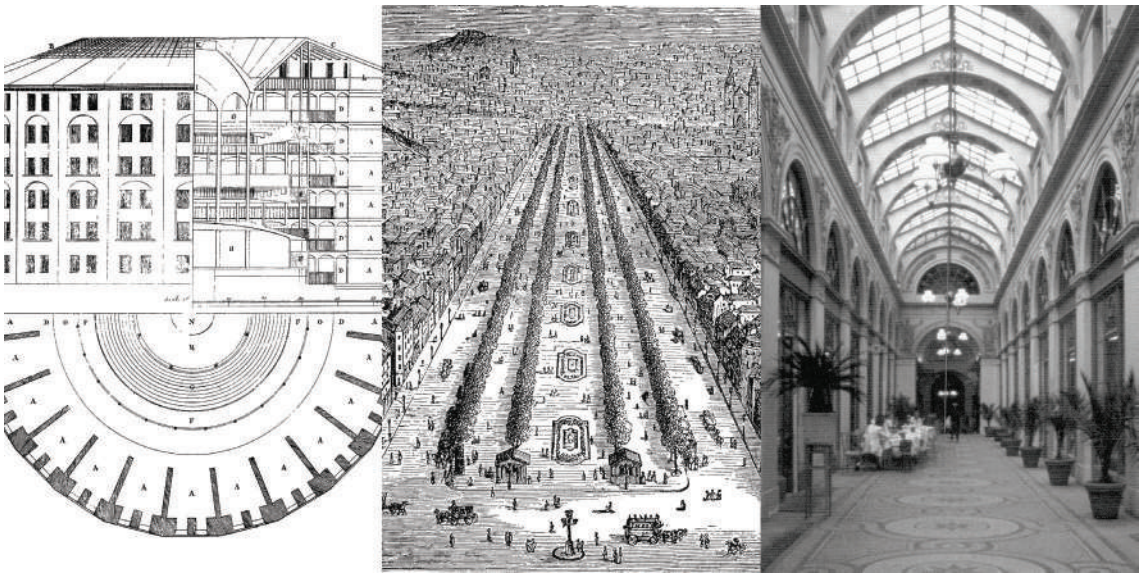


Fig. 1: A general Idea of the Panopticon, drawn by Willey Reveley, 1791 (Jeremy Bentham, *The Works of Jeremy Bentham*, 11 vols (Edinburgh: William Tait, 1838-1843), IV, pp. 172-173.; Boulevard Richard Le Noir, Georges-Eugène Haussmann, 1861, Source unknown.; Gallerie Vivienne, Cover Image of Walter Benjamin, *The Arcades Project* (New York: Belknap Press, 2002).

modernization regarding the cities changed organization, describing the role of infrastructure as the *management of transformation* in pursuit of a new network paradigm.

3) In regard to psychological modernization most authors and artists have started imaging the desubjectivation of citizens and their alienation in becoming urban forms of life. The former city right had bound together a social body. The rules of urbanity cut this relationship asunder, forcing urbanites to become a mere part of the physical processes of city-life itself. Walter Benjamin left us his description how 'the domestic interior moves outside' and he characterized the figures and figurations of this process.[4] Covering formerly open-air public space, to ease – say control – the environmental conditions for the economic exchange of goods, the Parisian arcades became the third cliché. Taken as some compensating sphere, the emergence of the bourgeois *intérieurs* and arcades, the *passages couverts*, were pictured as the generation of new typologies of accumulation, and elaborated on widely regarding an emerging class consciousness and new spaces of self-definition at the beginnings of the consumption-oriented environment of Europe's capital cities.

Those three images are, rather significantly, widely mistaken as three separable pieces; at best they are held as complementary forms of modernization, due to different interdisciplinary interests between architecture theory, philosophy, social sciences and literature. Taken apart in different fields and from different perspectives, they formed a great body of knowledge constantly added to. But while being a contingently obligatory, but not logical or necessary cascade of events, those aspects were hardly exposed together, as a strange *triptych*.

If we link the aspects, we can quickly recognize the manner in which they depict (new) forms and their (new) interaction, more than asking how they *take form*. Since '[t]he constituted does not resemble its process of production, its constitution' these images of thought fail to arrive at a basic understanding of the effectuating operating forces in what conditions those forms to take form.[5] But approaching modernization precisely from the point of view of form-taking renders a critical blind spot at the very intersection of the three clichés. And, as I want to argue, it is precisely this blind spot that manifests the singularity of modern architecture. In order to reveal this scotomic error regarding architecture, a non-representational theory formation becomes necessary to see architecture as a material practice within an ecology of mutually co-determining factors – and not the determinant, nor the (over-) determined thing in a state of affairs. This conception would however be the basis to understand the formation of modern space as a specific ecology, and to shed light on its constitution. As a result, instead of simply connecting what was happening, it might be more interesting to ask, what's going on in what's happening?

My interest lies in the wider *morphogenetic* landscape of modernity. This provoked me to reconsider the clichés as interdependent surface effects caused on the same engineering strata of modern subjectivation. To arrive at this lower strata one would require a theory that interlinks the disciplinary dispositive within the disjunctive production of modern space, with the engineering of resource flows and connections of infrastructure, and the constitution of spheres of consumption, in the self-alteration of the same urban body. Thus it will be necessary to merge the three layers on the same level, by understanding that they, first of all, present *material practices*. From there, when taken as one piece – a morphogenetic map of modernity – we can close the triptych and fold its aspects for the sake of form-taking. This two-fold implication will conclude this paper.

Immunization as an immanent practice

In the following three parts I will introduce three notions of related morphogenetic processes – traversing the clinico-legal, material-discursive, physical-conceptual, ecosystemic-semiotic fields – that allow us to reconceptualize the formation of modern bodies (i.e. both humans and architectures). Let me start by bringing together the three aspects of modernization through what they form at base. Not to be mistaken as an analogous or super-structural principle, but as a common pattern of morphogenesis, enclosures, infrastructures and interiors perform a *progressive internalization of externalities.*

This first step will introduce a new concept opening the adaptation of bodies beyond biopolitical terms of normalization. To bring the spatial institutions of modernity (containment) and its spaces of circulation (infrastructure) on one plane, it will be necessary to reframe Foucault's notion of biopolitics and its concern with its impact on the individual body (i.e. from its militant disciplinary dispositive and the formal structures, practices, institutions, architectures) by redirecting the discussion about the constitution of individual bodies and enclosures towards the questions how their (let's call it) 'togetherness', their ensemble is made possible. This possibility is no question of a virtual condition, but one of its actualization as a world. Deleuze and Guattari posed this as a problem of *consistency*.[6] The resulting question is thus, what constitutes the (re-established) homeostatic conditions of modern heterogeneity, without fully neutralizing it?

Roberto Esposito's affirmative take on biopolitics offers the most promising considerations in this regard. Whereas Foucault problematized biopolitics in terms of the individual and its body, Esposito approaches existential territories (to use Guattari's term) where 'community is the condition.'[7] A matter of heterogeneity then, he connects and extends well-known thoughts in postmodern critical (and clinical) thinking through the clinico-legal concept of immunization of which he finds 'the most refined articulation' in Niklas Luhmann's account on social systems.[8] Constituting a 'specific form of modernization', Luhmann had described a strangely immunitary logic at work between systems and environments. Esposito repeats this diagnosis in his recent work *Terms of the Political,* to describe how in this modernizing process 'the problem of systemically controlling dangerous environmental conflicts is resolved not only through a simple reduction of environmental complexity but instead through its transformation from exterior complexity to a complexity that is internal to the system itself.'[9] Seeing biopolitics from this perspective, Esposito no longer constricts modern individualization to shaping docile bodies by larger socio-economical power relations. This take enables us to understand the individuation of society, i.e. both its own becoming-modern and the formation of individual subjectivity, through the *plasticity* of heterogeneous assemblage as a system or ecology itself.

While asking '[w]hat is immunization, if not a progressive interiorization of an outside?'[10] Esposito poses a monstrous transdisciplinary problem, and architectural concern. A first complication would derive from rethinking how the interiorizing *agency* of architecture participates in this system, instead of merely housing or giving form to it. But this agency might easily be instrumentalized in a *(bio)politicization* of architecture, similar to Pier Vittorio Aureli's more Agambian take.[11] Esposito unfolds some thought regarding this interiorization, worth quoting at length, which would cross such perspectives:

> To this first strategy of interiorization, however, which is activated by an immunitary process, a second one is added, which is much more laden with *consequences for environmental difference* – namely, its complete inclusion within the system or its objective elimination. This development in Luhmann's thought, which occurs when he adopts the biological concept of autopoiesis, shifts the lens from the defensive level of systemic

> government of the environment to an internal self-regulation of systems […]. The system reproduces itself in increasingly complex forms, such that it constitutes the very elements that compose it.[12]

The image we have all been told that the immune system be some sort of military device within our bodies is seriously out-dated. First, the idea that antibodies flow within our vascular and limbic systems, in-between our flesh and bones, controlled by our cognitive apparatus, follows a conception that separates mind, body and metabolism, whereas they are assembled on the same plane of composition. Second, illnesses are still held as something that happens 'to' a body, or 'within' it, instead of taking it as a non-homeostatic problematization 'of' its inherent heterogeneity.

More than reacting to some state of exception, immune systems build up a milieu of experience and patterns of responsiveness. Immune systems 'operate without communication' as Luhmann claimed.[13] Since the material flows of signalling substances operates on the same ontological plane, on which the forms are assembled, there simply is – thinking *par le milieu* – no different medium with which communication could be transmitted. In this regard one of the most important features for immunological responses relies on the body's ability for so-called Self/Non-self discrimination and its capacity to recognize patterns of potentially patho*genic* development. As such, the concept of immunization calls for a complete refraction of the paradigms of the patho*logical*/normal. The object of such a material practice is thus no longer a matter of normalization; immunity rather features some calculated sort of *laissez-faire*. Even more than Maturana and Varela term of autopoiesis, and Luhmann's modification of it as a general systems concept, immunization not only addresses how a system reproduces itself, how it leads a life, but also how it actually negotiates difference.[14] In this Deleuzo-Guattarian perspective, we have to insist that

> Difference is difference in degrees of 'power'; in interpreting this term we must distinguish the two French words *puissance* and *pouvoir*. In social terms, *puissance* is immanent power, power to act rather than power to dominate another; we could say that *puissance* is *praxis* (in which equals clash or act together) rather than *poiesis* (in which others are matter to be formed by the command of a superior, a sense of transcendent power that matches what *pouvoir* indicates for Deleuze). In the most general terms Deleuze develops throughout his career, *puissance* is the ability to affect and to be affected, to form assemblages or consistencies, that is, *to form emergent unities that nonetheless respect the heterogeneity of their components*.[15]

By echoing this distinction Esposito's affirmative account tells apart the Foucauldian notion of biopower into a politics *of* life ('biopotenza' in his terms) from a politics *over* life ('biopotere'). This helps us to push past the conceptual transition we underwent from modern *defense*-thinking – a construction of stability that power is concerned with – towards contemporary issues of *control*, with the potentials and incapacities of internal self-regulation within permanent change. In line with the new self-conception derived from the anthropocene hypothesis, this adds a far-reaching ecosystemic aspect to Michael Hardt's statement, how the global society of control has produced 'a world with no more outside'.[16] Immunization calls 'into question the very ideas of any outside.'[17]

Arrangement as a productive formation

Immunological thinking addresses biopolitics no longer in terms of containment and normalization, bodies and societies, individuals and power, and heterotopias, but as a matter of inclusion and differentiation, embodiment and assemblages, heterogeneity and self-regulation, and ecologies. It addresses the body's immanent capacity for

adaptation and self-transformation as a responsive form of embodiment. Immunity does not operate through barriers of separation between inside and outside (catchword: 'defense') where the filtering of relations is not a filtering of pre-existing elements. Instead it produces new limits as filters of relations ('control'). Thus material-discourse practices are themselves boundary-*drawing* agencies. This brings us to a second point.

The modern role of ordering of the built environment has sufficiently been described by analyses following Foucault. An important step to understand architecture as a transformative practice was made with realizing how architecture in its becoming-modern stops to symbolically represents a total order, but become itself a tool for ordering a given totality.[18] The 'role' of ordering continues to underlie power structures, albeit they are themselves forms, not conditions. To credit that architecture does not represent social reality, but how it produces it in the first place the following concept targets at bulldozing – a kind of theoretical Haussmannization – the historically elevated stand of forms.

A series of authors from Deleuze onwards challenged us to think relations as prior to their *relata*, which only emerge as a secondary effect. To overcome the dualism between matter and meaning recent theories of new materialism (a term coined by Manuel DeLanda and Rosi Braidotti in the late nineties) take up this relational ontology by theorizing precisely their irreducible *entanglement*. Karan Barad's agential realism, that blurs classical distinctions between ontology, epistemology and ethics, offers the most provocative thoughts in that regard.[19] Her book *Meeting the Universe Halfway* postulates how material arrangements attain a fully-fledged agency in *producing* reality and meaning. In her reading, spanning the physical-conceptual to the material-discursive, Barad initially criticizes that

> If Foucault, in queering Marx, positions the body as the locus of productive forces, [then such a theory] would necessarily take account of *how the body's materiality* […] *and how other material forces as well* […] *actively matter to the processes of materialization*.'[20]

As Foucault's 'largely postrepresentationalist account' fails to outline *how bodies come to matter*, Barad approaches the body by relating it to experimental set-ups. She brings its materiality on a performative level. It is Niels Bohr's philosophy-physics and its 'proto-performative' take on experimental apparatuses from which she derives a new theory formation.[21] Apparatuses are not mediating devices or laboratory instruments to discover reality, but they become constitutive of creating new phenomena. She cites Ian Hacking to remind us that

> Most experiments don't work most of the time. To ignore this fact is to forget what experimentation is doing. To experiment is to create, produce, refine and stabilize phenomena […] But phenomena are hard to produce in any stable way. That is why I spoke of creating and not merely discovering phenomena.[22]

In this reworking these relationships, she posits that apparatuses are not 'static arrangements *in* the world', with which to detect or record pre-existing phenomena of reality. Instead, she reformulates how apparatuses become 'dynamic (re)configurings *of* the world'. Thus they produce differences that matter as observable phenomena. Agential realism challenges us to rethink *morphogenesis* as *phaenogenesis* at once. In claiming that arrangements become 'the material conditions of possibility and impossibility of mattering' Barad provokes a wholly new perspective on material practices and bodies, that allows us to conclude on this second point of material arrangements.[23]

Barad reposes how the material configuration of experimental set-ups produces physical

phenomena, enabling new epistemic realities. By theorizing that (and how) new material forms cause new phenomena, can we not rethink the emergence of new social realities in the same way? My (architectural) interest in this kind of *etiology* of material arrangements lies precisely in the aspect of configurings within semiotic systems, of which I consider the built environment to be one. Agential realism enables us to repose and re-theorize, how processes of subjectivation, the de- and resubjectivication of modernity become actually configured by the physical arrangement of the modern city. For me, the notion of arrangement does not denominate some state of constellation. It names a two-fold dynamic of becoming: first, an adaptation to a given condition, and second, an alteration of the environment that constitutes those conditions. How does a body *arrange itself to* new and challenging conditions (i.e. the emerging socio-political and economic conditions encountered in modernity), and how does that cause an altered physical *arrangement of* a new life-world within these conditions? Thus likewise to Barad it involves an ethical dimension.

While Deleuze and Guattari have already laid out such an arrangement theory in *A Thousand Plateaus*, for a strange reason precisely this part of their work has received little attention. The next part will retrace some implications of their work, as they gave us exactly the two crucial examples we need: the Panopticon and the DNA.

Stabilization as an expressive becoming

From the idea of experimental arrangements as *phenomena-producing* material configurations, we arrive at a third and very crucial refraction of modernization processes. With the growth of modern times change presented a steady process. As said in the beginning, in ecology change does not happen 'in' an environment, as rather 'of' it. Given that modernity is frequently rendered a period of massive change, we do actually ignore its massive attempts of *stabilization,* and precisely the stabilization of its transitional environment (i.e. migration, resource scarcity, etc.). Through Barad's agential realist understanding of Hacking's take on experimentation, it is – contrary to the transience of modernity – *the processes of stabilization* that precisely appears to us *as* modernization. This means that architecture needs to be reconsidered as a fundamentally transformative practice, but only in order to stress how during modernity and its steady change, its transformative function became to make cities more stable. In this becoming-modern, the fundamental ecological question was how the modern city could form a new homeostasis. *How can a thing become stable?*

A theory that *epitomizes* this problem is of course Deleuze and Guattari's concept of *agencement*, or assemblage. Their metaphysics of difference approaches the problem how things and their meaning can change in reverse, following Gilbert Simondon's impulse that the metastable process of becoming is nothing to be explained, but an answer.[24] The key moment for approaching the 'genesis of form' is in *A Thousand Plateaus*. Here they synthesize a complex approach that aims to deep-six the representational *form-content dualisms.* Allow me to refer to the full complexity of their concept of a process of 'double articulation', before outlining this two-fold genesis of geological, biological formations as much as social ones.[25] In their geo-philosophical perspective Deleuze and Guattari place all geneses within one material realm. Located within the formations of historical sediments – so-called strata – and their persistent creation of order (stratification), anything new can only form from a pre-existing stratum.[26] They describe this formation as an extraction of an existential territory from a surrounding milieu. Territories are territorializations of a milieu. This process defines a content, as it 'concerns the materiality of a stratum: the selection of raw materials out of which it will be synthesized.'[27] But here Deleuze and Guattari stop the trend to think this territory already as a form. Instead, in pursue of a non-representational account on these processes,

they revise that form can only arise from (and thus be juxtaposed to) unformed substances. Thus in their words, it is the process of territorialization in, and by which substances merely *articulate* a form. This is the so-called first articulation.

This selection features some 'instance of intentionality' (to use Guattari's term), which must be seen as another articulation; a second articulation that concerns the expressivity of the stratum.[28] Territories produce codes in a process of 'folding' or self-reference. Territories are only expressed, and thus actualized, by the codes they produce. The selected content *articulates itself in* its expression. But crucially, also expressions can consist of both formed and unformed substances.

Louis Hjelmslev's tetravalent sign model, which broke up Saussure's bilateral signifier/signified model, had reweaved the relationships between the notions of form and content, substance and expression. Deleuze and Guattari finally understand this interrelated *genesis* as a *semiotic system*, producing meaning through material practices. Hjelmslev's net offers Deleuze and Guattari the two-fold structure of stratification: In this matrix a substance of content articulates an assemblage's chosen material; a form of content articulates an assemblage's chosen order or hierarchy; a substance of expression in which an assemblage articulates its structure; and a form of expression in which an assemblage articulates its organization. [figs. 2-3]

To bring us back to the form-taking of the built environment, Deleuze himself already described an architectural function in this process. On the one hand, in its irreducible state of things, every 'form of content' can be considered an 'architecture'. But beyond this conception, Deleuze defines – the other way around, – built architecture precisely as a form of content. First in *A Thousand Plateaus* and later in *Foucault* he uses the prison as an example of a form of content, reciprocally co-emerging with the emerging diagram of surveillance societies.[29]

> The content has both a form and a substance: for example, the form is 'prison' and the substance is those, who are locked up, the prisoners […]. The expression also has a form and a substance: for example the form is penal law and the substance is 'delinquency' in so far as it is the object of statements.[30]

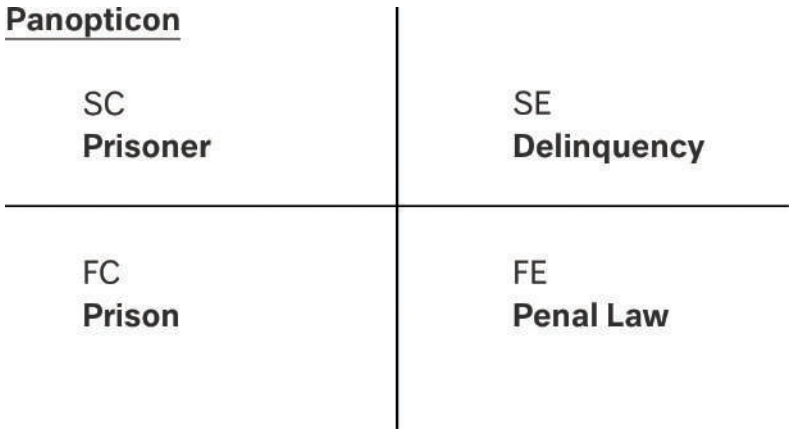
Here we face something else then Foucault's post-representationalist prisoner/prison relation, designed according to Bentham's diagram of panopticism as a sociopolitical, normalizing, separating and individualizing instrument. Deleuze and Guattari completely re-pose these relations. They approach the prison not in terms of individual bodies in relation to each other as a totality. [figs. 4-5]

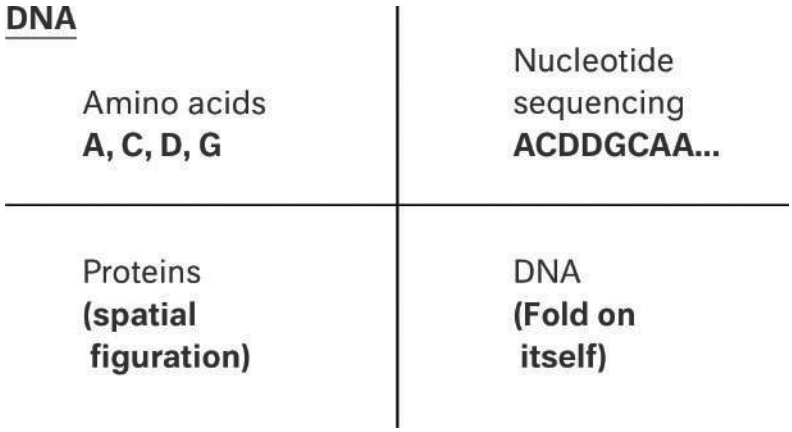
They theorize a form-taking whole, in which a spatial arrangement gains a 'function' by how it *arranges a multiplicity.* They rethink it in terms of a collective body, by way of arranging the material relations in its compound: here as an arrangement that locks up (territorializing, content, passive), those who are to be locked up (folding, expression, dynamic), it *draws together* a state of affairs whose relations actually produce, or actualize relata as forms and their statements (i.e. the prisoners). Their troubleshooting of the Foucauldian system therewith recovers the full range of ecological and economical dimensions in the problem of arrangement. The full implication on the question, how things can get stable at all is given in their second example of the DNA. Here the form of content is given as the spatial configuration of proteins. It configures its productive potential, but even more importantly, it also *lays out* its *reproductive* capacities (or call it 'continuous production' to not fall back on an identitarian schema). Hence 'form of content is reducible not to a thing but to a complex state of things as a formation of power (architecture, regimentation, etc.).'[31] An assemblage hence maintains some *eigenstate* of affairs producing and enacting

	content (sedimen- tation)	**expression (folding)**
substance	substance of content	substance of expression
form	form of content	form of expression

SC **chosen materials**	SE **chosen order/ hierarchy**
FC **(spatial) Structure**	FE **organization**

Figs. 2-3: Matrix of stratification (redrawn after Deleuze and Guattari, A Thousand Plateaus, 43ff).





Figs. 4-5: The Panopticon and the DNA (after Deleuze and Guattari, *A Thousand Plateaus*, pp. 43-44, 59, 66-67, and John Protevi, 'Organism' in Adrian Parr (ed.), *The Deleuze Dictionary*, pp. 195-6.)

those phenomena that ensure its own continuance. And a becoming describes precisely the experimentation to arrive at such.

Refractions: The three syntheses of modernization

Here, I want to return to the specific organization of modernity. Cutting across my discussion up to here, the process of stratification helps us to conceptualize the immanence of bodies' or ecologies' hereterogeneity. It gives us another take on bodies or ecologies as performative embodiments, as a field of intensity (territory) in a steady process of (de-/re-) territorialisation. The process of territorialization refracts the discussed process of immunization and the problem of a body's self-regulation as a site of production (1). Through this lens we can see the boundary-drawing agency of material practices, as the de- and re-territorializing processes of permanent reconfiguration. Embodied ecologies, atoms, waves, humans, cities are the phenomena-producing arrangements of the first articulation. Bodies are no forms, neither are ecologies or architectures. *Articulated in* a form, bodies are products, while at once they remain a productive site (2). Their form of content is becomes a two-fold formation of power. The second articulation *in which those bodies expresses themselves,* the articulation which constitutes its subjectivity, is a completely different matter. More than being simply productive, they adapt to reciprocate a reproductive metastability. As a recursive practice, this is a matter of folding (3). This act of folding, allows us to finally close a loop to the beginning, pertaining to immunization and the folding processes of its progressive interiorization of an outside.

My argumentation up to here was aiming at precisely this close loop, in the hope to share a certain astonishment. As much as Esposito conceptualizes immunization as the privation of persons from too much community, Deleuze conceptualized the fold as a relationship of oneself to (and 'over') ones 'self' by producing a controlled (or dominated) interior. Therewith Deleuze explicates these folding processes at the very heart of the formation of capitalist subjectivity, regarding the problem, how to 'have' means to fold that which is outside inside.[32] From this perspective, is it not astounding that architecture (i.e. its stabilizing techne, its interiorizing function, its transformative agency) was never really addressed from an ecosystemic perspective on reproduction*;* as a continuated production. It is my opinion that precisely here, at the intersection between architecture, philosophy, sociology, and ecology, a blind spot had emerged regarding the double articulation of modernity in built space. In their project on *Capitalism an Schizophrenia* Deleuze and Guattari have critically disassembled the body of capitalism, in which they outline the three syntheses that compose the 'transcendental conditions' of capitalist existence, which they located on each a semiological, physiological and psychological register. If we – as I have argued throughout – take all bodies on the same plane of material composition, then this 'body of capitalism' must be articulated in the urban territories and articulate itself in their processes of territorialization (political economy). Let us hence take a second look at the triptych presented before:

The abovementioned post-human understanding of bodies as heterogeneous assemblages and the concept of immunization, will refract the cliché on the modern spaces of enclosure. Modern spaces of enclosure do not in any way represent anything, also no diagram of forces. Rather, its inclusive development – as a diagram – constitutes the material condition of modernization. Beginning with the *inclosure* of common land in industrializing Britain, to the cellular building types across modern Europe, one can recognize a clear pattern of discretion as the spatial counter-actualizations to the formation of modern subjectivity. The morphogenetic hypothesis of the following is thus, extended from Foucault, that modernization has produced the individual as a discrete self, through configuring a likewise

discretely organized modern world. Therefore the Foucauldian cliché would require reformulation not in merely terms of individuals and spaces of enclosure and spheres, but in terms of assembling a heterogenous (as Peter Sloterdijk has put it) foam-like body without organs that produces a matrix of surplus appropriation, and of circulation and distribution. It performs what Deleuze and Guattari call a *disjunctive synthesis*, or a synthesis of recording, 'of distributions and of co-ordinates that serve as points of reference.'[33] The cellular organization of modern space, its signifying totality, puts its co-emerging individuals in a relation of non-relation. Forming a body without organs, this synthesis gives the semiotic register of modernization. But, as Steven Shaviro describes on Deleuze's three syntheses,

> In order to function, the disjunctive synthesis must be preceded by a connective synthesis, a synthesis of production, or 'of actions and of passions': a fuel upon which the body of capital is able to feed. And it must be followed by a conjunctive synthesis, a synthesis of consumption or consummation (consommation), 'of sensual pleasures, of anxiety, and of pain': a spark of self-enjoyment that discharges tensions and reboots the entire reproductive process.[34]

Thus, let us see the other two clichés from this perspective. The abovementioned agential realist take on material set-ups for the production of social reality refracts the cliché of the infrastructural installation of urbanity as a synthesis of production. Infrastructuralization presents a matter of internal re-relation and re-arrangement, a distribution of inequalities, in both terms of spatial form-finding and adaptation to constraints. While looking at Haussmannization from the perspective of morphogenesis then, the emergence of infrastructure is less significant, than the economies and ecologies that develop along with its fabrication. With the internalization of externalities, new filters of economical relations are drawn, while earlier formations of customs are vanishing. In this connective synthesis, the construction of new infrastructure majorly altered the city. However, to read Shaviro's words in relation to Haussmanization, the 'first synthesis, the connective synthesis of production, can be identified with the actual labor process: that is to say, with "purposeful activity" that transforms the world.'[35] Therewith it concerns the physiological register of modernization. While considering the city as an organism, it propels the totalization of production: 'Capitalism's command is utterly simple: connect deterritorialized flows of labor and capital and extract a surplus from that connection. Thus capitalism sets loose an enormous productive charge – connect those flows! Faster, faster! – the surpluses of which the institutions of private property try to register as belonging to individuals.'[36]

Finally, the abovementioned relationship between folding processes at work in capitalism and the interiorizing function of architecture thus will refract the Benjaminian cliché on modern subjectivity as a conjunctive synthesis. 'For Kant, the world emerges from the subject'; but for Deleuze and Guattari, as for Whitehead, 'the subject emerges from the world.'[37] From a morphogenetic perspective on the individualization of society, what has produced the modern individual is the segmentarity of modern society and its space. It conditioned a wide-spread promotion transforming feudal subjectivity (of subsistence) through preservation and production towards an urban subjectivity (of growth) beyond forms of surplus accumulation and value creation: consumers. This synthesis thus finally forms the psychological register of modernity. The production of new sorts of desiring-machines (passages, boulevards, parks, cafés, interieurs) marks a synthesis of consumption, in which 'something on the order of a subject can be discerned.'[38] All it can do is to consume. But other than Benjamin's flâneur, the subject of the conjunctive synthesis is 'a strange subject, […] with no fixed identity, wandering about over the body without organs, but always remaining peripheral to the desiring-machines, being defined

by the share of the product it takes for itself, […] being born of the states that it consumes […]'.[39]

Conclusion: The double articulation of modernity in built space

The three concepts of immunization, arrangement and self-regulation have allowed us to rethink the clichés of modernity from immanent and transversals perspectives regarding the morphogenesis of modern space. These refractions however also point us thus to a *two-fold* process of form-taking, that furthermore inflects these clichés in two directions: modern architecture's relation to individuals, and both their process of individuation, or becoming-modern. Thus I want to conclude this paper by folding the triptych along these interpictorial lines of thinking, and therewith end with the triptych's two-fold back face. [fig. 6]

In the triptych, a first crease can be made between architecture and its relation to individuals. When folding onto another the Foucauldian and Haussmannian depictions of modernity both focussing on the reconfiguration of public spaces and buildings, and their impact on individual bodies, what see how both neglect the *individual sphere within the collective body*. Itself confined to institutions and their spaces of enclosure, recent discourse eventually blinded out, how alongside the new infrastructures a much more powerful assemblage of subjectivation has taken form over the course of modernity. What has strangely been paid rare attention to is, how – with a *cellular* logic akin to barracks, schools, hospitals, etc. – over the course of modernity also modern living, *apartments*, have also taken form alongside Haussmannian infrastructural works.[40] *The Genesis of Apartments*, as the modern form of living remained completely disregarded and unstudied as a recurring pattern of organization, within the heterogeneous composition of the modern city. Apartment dwelling is for me not another form of modernization. In my opinion it is its socio-spatial condition.

A second crease can be made between the Foucauldian and Benjaminian clichés. Inflecting over processes of individuation, this fold would problematize the role of architecture in the configuration of modern subjectivity. In this picture, we find Caillebotte's young man looking at the renovated city as a rather lonely figure that recalls Balzac's description of the monadic universe of the Bourgeois.[41] Opposed to Benjamin's abovementioned thought that 'the domestic interior moves outside', I am rather interested in looking at how processes of *interiorization* condition a remnant domesticity to take place within an emerging form of dwelling and that mutually takes form with a new urban subjectivity of an emerging bourgeois and individual form of life. A space from which labor and production became increasingly outsourced elsewhere, the modern form of living became the prime arrangement of reproduction. Apartments, would need to be fundamentally addressed in relation to the constitution of capital(ist) cities and the subjectivity of its urban population. Becoming-modern is not a matter of being *confined*. The modern apartment became the very arrangement of an emerging urban form of life *trying to 'define' itself* by producing new filters of relations to themselves, to each other and to other agents within the same consolidating milieu of the modern city. Hence let me pose the entire question regarding modern ecologies in a very blunt way: As the most significant concretization of modernization in built environment, is it not the apartment that effectually arranged the modern world?

Fig. 6: Paris apartment building. Cross-section image, showing apartment hierarchy. Edmond Texier, *Tableau de Paris*, 2 vols (Paris: Paulin et le Chevalier, 1852), I, p. 65.; Gustave Caillebotte, *A Young Man At His Window*, 1875.

Notes

1. One of the big historical complications in (mis-)understanding the body was its assumed unity, rendering the city (and the state too) an organism, while foregrounded its system of organs (institutions) and their vital functions, its concerns for hygiene and contamination, its well-being, its identity, its autonomy.
2. Stress, against today's conception that renders it some psychological imbalance, has an important physiological function. Bodies respond to stress by running programs of stress processing systems, as a systemic response to something increasingly happening, hitherto unencountered, yet unresolved. Stress presents a body's method of reacting to events or long-term environmental conditions that challenge its internal stability. As a process of self-adaptation, long-term stress not only affects brain functions; it crucially generates lasting changes in its structure and new behavioural patterns. See e.g. J. Douglas Bremner (et all.) 'Structural and functional plasticity of the human brain in posttraumatic stress disorder', *Progressive Brain Research* (2008) 167, pp. 171-86. But more than suggesting that modernity is a kind of stress disorder (although I like the idea), my intention is to foreground that bodies possess a capacity for self-adaptation to changing environmental conditions.
3. Sven-Olov Wallenstein, *Biopolitics and the Emergence of Modern Architecture*, (New York: Buell Center / FORuM Project and Princeton Architectural Press, 2009), p. 20.
4. Walter Benjamin, Convolut L 'The dream House', L1,5, in *The Arcades Project*, (Cambridge, MA: Harvard University Press, 1999), pp. 405-15, p. 406. In my conclusion, I will come back to this idea in the end, and explain why I consider this to be a problematic and misguiding image.
5. Joe Hughes, *Deleuze and the Genesis of Representation* (London/New York: Continuum, 2008) p. 8. See also Gilles Deleuze, *Difference and Repetition,* transl. Paul Patton (New York: Columbia University Press, 1994 [1968]), p. 160.
6. Gilles Deleuze and Félix Guattari. *A Thousand Plateaus: Capitalism and schizophrenia II*, trans. Brian Massumi. (Minnesota: University of Minnesota Press, 1987), pp. 323-37. This passage contains the entire problematic of following discussion.
7. 'Community is neither origin nor a telos, neither goal or end […] Instead community is the condition […] of our existence.' Vanessa Lemm, 'Introduction', in Roberto Esposito, *Terms of the Political. Community, Immunity, Biopolitics* (New York: Fordham, 2013), pp. 1-13 (p. 11).
8. Roberto Esposito, *Terms of the Political. Community, Immunity, Biopolitics* (New York: Fordham, 2013), p. 41; Niklas Luhmann, *Social systems* (Stanford, CA: Standord University Press, 1995).
9. Esposito, *Terms of the Political. Community, Immunity, Biopolitics*, 2013, p. 41.
10. Ibid.
11. Aureli's posits that 'Through its act of separation and being separated, architecture reveals at once the essence of the city and the essence of itself as political form: the city as the composition of (separate) parts.' The city is here envisioned as a struggle-some 'condition where parts are separated yet united by the common ground of their juxtaposition.' Pier Vittorio Aureli: The Possibility of an Abolute Architecture (Cambridge: MIT Press, 2011), pp. x-xi.
12. Esposito, 2013, p. 41. Emphasis added.
13. Ibid., p. 42, cited after Luhmann 1995, 382.
14. Humberto R. Maturana and Francisco J. Varela, 'Autopoiesis and Cognition', in *Boston Studies in the Philosophy of Science*, Vol. 42, (Dordrecht: Reidel, 1980).
15. Smith, Daniel and Protevi, John, 'Gilles Deleuze', *The Stanford Encyclopedia of Philosophy* (Spring 2013 Edition), ed. by Edward N. Zalta, <http://plato.stanford.edu/archives/spr2013/entries/deleuze> [accessed 30 January 2015]. Emphasis added.
16. Michael Hardt, 'The global society of control.' *Discourse* (1998): pp. 139-52.
17. Esposito, 2013, p. 41.
18. Wallenstein, *Biopolitics and the Emergence of Modern Architecture*, p. 20
19. Karan Barad, *Meeting the Universe Halfway. Quantum physics and the entanglement of matter and meaning*

(Durhan/London: Duke University Press, 2007).

20. Ibid., 65. Emphasis in the original.
21. Ibid., 67.
22. Ian Hacking, *Representing and Intervening. Introductory Topics in the Philosophy of Natural Science* (New York: Cambridge University Press, 1983), p. 230. Cited after Barad 2007, p. 144.
23. Barad, p. 148.
24. Gilbert Simondon, 'The Genesis of the Individual', in *Incorporations* 6, ed. by Jonathan Crary and Sanford Kwinter (New York: Zone Books, 1992), pp. 296-319 (p. 299).
25. Deleuze and Guattari. *A Thousand Plateaus*, pp. 39-74 and pp. 310-50.
26. The geological term conceptualizes dynamic intervals in a material environment, characterized by their internal consistency that distinguishes them from other strata.
27. Manuel Delanda, Deleuze: History and Science (New York: Atropos, 2010), p. 32.
28. Félix Guattari, *Chaosmosis: an ethico-aesthetic paradigm* (Bloomington and Indianapolis: Indiana University Press, 1995), 22.
29. Deleuze and Guattari. *A Thousand Plateaus*, pp. 66-7; Gilles Deleuze, *Foucault* (London/New York: Continuum, 2005 (1988)), pp. 41-5
30. Deleuze, *Foucault*, p. 41.
31. Deleuze and Guattari. *A Thousand Plateaus*, p. 66.
32. I borrow this formulation from Simon O'Sullivan, 'Fold', in *The Deleuze Dictionary,* ed. by Adrian Parr (Oxford: Oxford University Press, 2010), pp. 102-4 (p. 103).
33. Gilles Deleuze and Félix Guattari, *Anti-Oedipus: Schizophrenia and Capitalism* (Minneapolis: University of Minnesota Press, 1983), p. 4.
34. Steven Shaviro 'The Connective and Disjunctive Syntheses', July 7, 2008. <http://www.shaviro.com/Blog/?p=646> [accessed 30 January 2015].
35. Ibid.
36. Smith and Protevi, 2013, n.p.
37. Steven Shaviro 'The (third) conjunctive Synthesis', July 14, 2008. <http://www.shaviro.com/Blog/?p=648> [accessed 30 January 2015].
38. Deleuze and Guattari, *Anti-Oedipus*, p. 18.
39. Ibid.
40. A valuable exception here is e.g. Sharon Marcus, *Apartment Stories: City and Home in the Nineteenth-Century Paris and London*, (Berkely and Los Angeles/London: University of California Press, 1999).
41. David Harvey, *Paris the Capital of Modernity* (Routledge: London/New York: 2000).

Biography

Robert A. Gorny is founder of relationalthought.com, a nomadic architectural agency established in 2010 that challenges the modes in which our built environment is composed. He recently finished his post-professional studies at the Berlage Center for Advanced Studies in Architecture and Urban Design at Delft University of Technology. After receiving his Diploma degree in 2009 from the State Academy of Arts and Design Stuttgart, he was as a long-term freelance collaborator for SMAQ – architecture urbanism research in Berlin, working also on independent projects, writings and art installations. Currently he acts as guest teacher at the Chair for Methods and Analysis and as research assistant at the Berlage, both within the Faculty of Architecture (TU Delft), where he prepares his doctoral research on the 'Genesis of Apartments'.

Revisiting the U-Machine: Gordon Pask and Stafford Beer's Adaptive Controllers and Post-humanist Design Epistemologies (1955-1965)

Dulmini Perera

Gordon Pask and Stafford Beer conducted a series of extraordinary cybernetic experiments in the late 1950s and early 1960s to design and construct artifacts that could be loosely termed 'adaptive controllers' that have been discarded as strange or eccentric, but hold important insights for post-humanist discourse in architecture.[1] Described as the 'U-machine' in Beer's schematics, the device was meant to be the brain of a steel factory, managing (i.e., controlling) its daily operations. [fig. 1] The nature of the U-machine was fascinating; in some experiments it took the form of naturally-occurring, self-organizing systems like the ecosystem of a pond, or colonies of daphnia, bees, or termites, but looped to mechanical circuits intending to enroll the agency of these organic systems in the process of factory management. In other instances this looping encouraged the U-machine, which in this case was a chemical system (fungoid devices), to literally grow its own senses so that it would find its own relevance criteria to solve the real world problem.[2] Disregarded as failed experiments of a 'digital culture,' this trajectory of experimentation is left out of many histories of cybernetics except for a few recent examples, two of which are particularly worth mentioning. First, Andrews Pickering's *The Cybernetic Brain* (2010) presents one of the most comprehensive historical accounts about British cybernetics while alluding to the philosophical implications of what he identifies as a 'non-modern' science.[3] Second, Peter Carini's paper *To Evolve an Ear* (1993) offers an in-depth technical explanation of these devices and their future potential.[4] These experiments are particularly valuable to contemporary architectural discourse in its search for post-humanist epistemologies to help reframe the polar relationship between what Gregory Bateson calls the 'logic of the living' and the 'logic of machines.'[5] Rethinking this polarity becomes pertinent in instances where architecture intersects with notions of computing.

The computer is not a biological entity. In fact, Gregory Bateson (1979) suggests that 'computer logic' and 'biological logic' are in many ways fundamentally incompatible though, paradoxically, computing machines are used to model our biological desire for survival.'[6] This, coupled with their capability to tabulate massive amounts of data, suggests that computing machines will play an integral role in dealing with most ecological and sustainability concerns. Due to an inability to deal with this paradox, the discourse has long tried to rethink the 'logic of living,' redefining it as the complex, self-organizing properties of living systems through the binary logic of digital computers, or attempting to make the logic of machines more biological. As Sanford Kwinter (1992) astutely points out, the classical processes of mechanizing life are giving way to a new and unprecedented vitalization of the machine.[7] The Postwar discourse in architecture, with its fascination in rethinking design through informational organization processes, contains ample examples of attempts to assimilate machine logic for living systems.[8] Christopher Alexander was one of the first architects to translate the self-organizing

properties of traditional, form generation processes to a binary logic thereby converting the whole design process to a mechanistic system: an algorithm which plays itself out.[9] *Communications Primer* (1955) – a documentary produced by Charles and Ray Eames – displays yet another example of this strange fascination.[10] The film's closing scene evokes a comparison between the human nervous system and a mechanical communication system as the viewer is gradually subjected to an electronic whine: the audible pulse of the computer. The Eames' were fascinated by the computer's logic of deconstructing all meaning and form into binary code. In contrast, the bio-genetic projects of Carl Chu epitomize contemporary approaches of applying biological notions to computing technologies to 'vitalize' the machine.[11] Yet what is needed in light of contemporary, post-humanist concerns is an epistemology that does not try to embed one within the other, but develops perspectives to observe the relationship between the two logics entangled in a process of 'co-evolution.'[12]

The ability to concentrate on the 'relation' is proven difficult in practical experimentation. Yet many experts assert that this is fundamental to ecological thinking.[13] Designers find solace in the easily identifiable binary categorizations which surround computing, such as man-machine, hardware-software, organic-inorganic, controller-controlled, and pattern-matter. Yet, the records of Beer and Pask's experiments on 'bio-computing assemblages' and its science fiction-like nature creates a sense of 'estrangement,' prompting the reader to rethink the aforementioned binary associations.[14] In this sense, cybernetics has much to offer architectural discourse: not only through a reading of cybernetic history to uncover evidence of digital culture and its related epistemologies (which has been done quite successfully by architectural historians and theoreticians like Antoine Picon), but rather by reading cybernetics in search of ecological history and its related epistemological practices.[15] The latter forms my cartographical entry point to this material.

Ecology and the Cybernetic Loop

The fundamental unit of the cybernetic discourse – the informational feedback loop – posits a fundamental systemic interconnectedness not only between living systems but also between organic and non-organic machine systems, thereby vastly expanding the idea of an 'ecological system' and calling the ontology of humanity into question. The prefix 'feedback' was paramount in its first order formations, as the loop was visualized as something designed to achieve a predetermined end embodying the intelligence of the whole. This is representative of what Andrew Pickering classified as the controlling modality of cybernetics, by which attempts were made to use intricate information loops to control complex systems ranging from missile guidance to city management.[16] In its second order reformulations beginning in the 1950s, researchers became aware of other important qualities of these information loops such as recursiveness, their relationship to circular causality, and the role they play in autopoietic (self-creating) 'living' systems.[17] Hence switching from an 'I-IT' to an 'I-Thou' version of understanding (i.e., the loop as sketched by Gregory Bateson for an interview in *Co-evolution Quarterly*), cyberneticians like Beer and Pask became increasingly aware of the fallacy of human attempts to control these self-organizing systems.[18] This shift contributed to important theoretical and critical conversations still occurring today in the cognitive sciences, chaos and complexity studies, and social systems theory. Hence, by remapping the terrain of knowledge with reference to the operational boundaries of systems and environments, the second order cybernetic discourse challenged both the technoid rigidity of cognitivist-related discussions in architecture (i.e., representational knowledge) and the ego-centric nature of design with humanity at its center. Instead, the cybernetic loop offers a transversal unit through

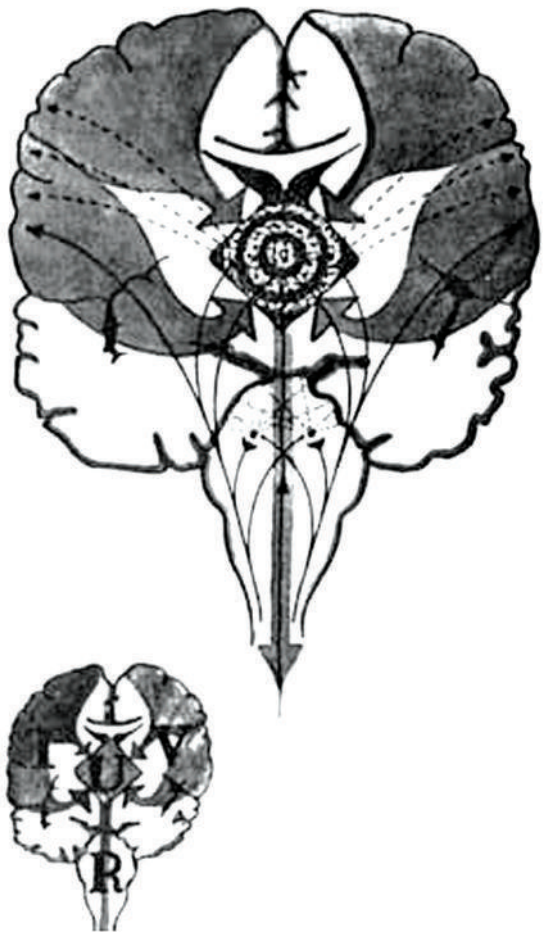


Fig. 1: Safford Beer's diagram of the whole theory. Source: Harnden & Leonard (1994, p. 198). Reproduced by permission of John Wiley & Sons and Allenna Leonard.

which designers can address the multiple ecologies which Felix Guattari defines as the psyche, socius, and the environment.[19] What follows is a brief introduction of how Beer and Pask worked with information loops in order to construct these artifacts and a few positions which highlight several interesting, design-related epistemological positions which emerged out of their experiments. [fig. 2]

Designing the U-machine

Three key figures need to be introduced with regard to these experiments: Ross Ashby, Gordon Pask, and Stafford Beer. Ross Ashby, though not directly involved in the experiments, worked on the homeostat and authored theories that had a considerable influence on Pask and Beer's later work; of these, the 'law of requisite variety' was most influential. Furthermore, Ashby's homeostat was modeled after the human brain – the most adaptive organ in the human body – and opened up a broad new discursive theoretical space for laws and mathematical models of dealing with control and complexity.[20] Gordon Pask is better known in architectural circles due to his collaborative work with Cedric Price and later teachings at the Architectural Association (AA). Being a dramaturge, the central notion of 'interaction' was at the core of his cybernetic work. The third figure, Stafford Beer, focused on encounters between theories of cybernetics and management. A deep entanglement between scientific and spiritual life is evident in his writings. His interest in Eastern spirituality – especially tantric yogi practices – grew over the years and became an integral part of his design praxis. As opposed to other cyberneticists whose works perhaps belong to a more theoretical realm, these three cyberneticists were 'mechanical philosophers' (a term suggested by Pask himself), for whom philosophy was connected to a material lineage of experimentation and thus particularly applicable to theoretical discussion in architecture which needs to be grounded in or emerge from praxis traditions.

Ashby, Pack and Beer were interested in the brain's behavioral aspects. The term 'behavior' needs explanation. As opposed to the more popular reading of cybernetics championed by proponents of digital culture and artificial intelligence (which relate to cognitivist models of the mind that consider the brain an information processing machine operating on representational knowledge structures), this line of British researchers were more concerned with understanding the brain as an organ which performs actions. The key feature of its ability to act was adaptation to environments that it had never previously encountered. In fact in *An Introduction to Cybernetics* (1956), Ashby states '[c]ybernetics treats not things but ways of behaving. It does not ask what this thing is? But what it can do.'[21]

Ashby experimented with the problem of adaptivity using his homeostat device. Homeostasis is the mammalian ability to keep certain essential variables within narrow limits, independent of changes in their environment. He argued that humans are not hard-wired to deal with all possible fluctuations, so it is important that we are able to learn about environments we have not encountered before. To him, such learning was linked to the notion of adaptation: the controller was to have this adaptive capacity, and the adaptiveness of a system was linked to its variety in a way he described with the law of requisite variety.[22] Hence, if one system is to effectively control another system, the controlling system (C) must have at least as much variety as the system it is to control (W). In other words, the variety of C must be greater than or equal to that of W, which reflects the real-world situation.[23] Architect and cyberneticist Ranulph Glanville, in his presentation *Freedom and the Machine* (2010), illustrated the impact of a system lacking sufficient variety. He states that if it is not possible to increase the variety of C, one tends to try to reduce the variety of W, which ultimately results in a rigid form of control. However if one could increase the variety of C a form of control that is enabling and non-restrictive

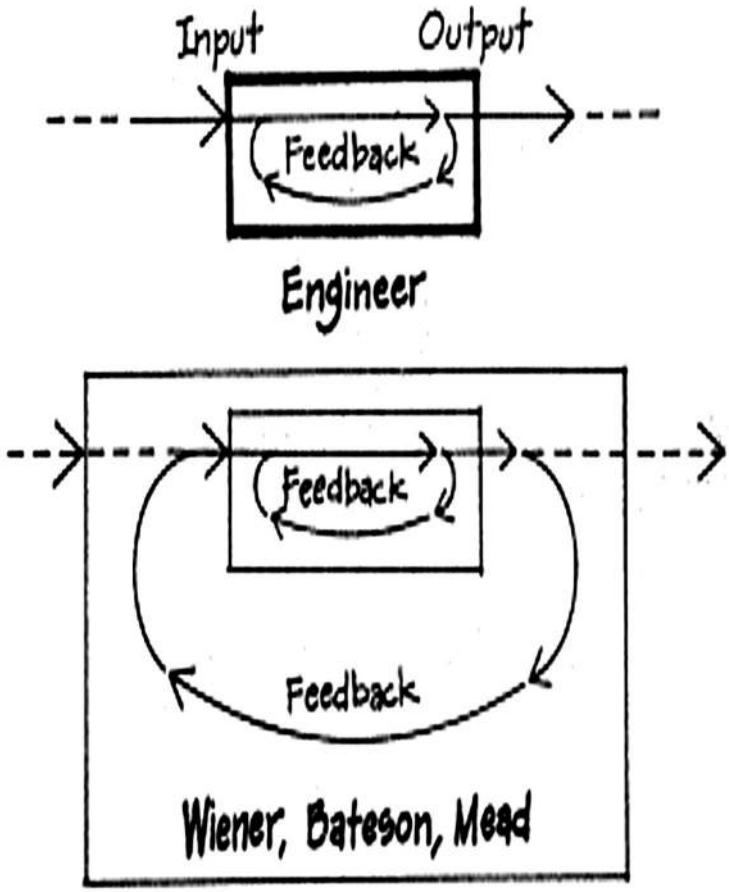


Fig. 2: The cybernetic Loop sketched by Gregory Bateson Source: Co-evolution quarterly (1976). Reproduced in A. Kleiner and S. Brand, Editors, Ten years of coevolution quarterly (San Francisco: North Point Press, 1986). Available at: http://www.oikos.org/forgod.htm

emerge.[24] [fig. 3-4]

Beer and Pask were trying to design a machine/artifact that could act as a controller of a high variety for a factory, so that the artifact could replace the human manager after sufficient training. Beer's cybernetic factory consisted of U-T-V machines of which the U-machine fabric is central to this discussion.[25] Here, perhaps rather than trying to design a fabric of such complex variety they questioned whether they could instead constrain the high variety of already existent complex living systems. Simply put, Beer's device directly applies biological material as a fabric upon which to perform computational functions. This bio-computer consists of a series of metabolic pathways involving biological materials that are engineered to behave in a certain manner based upon the inputs of the system. The resulting pathway of reactions that take place constitute an output. The most successful fabrics were Pask's chemical systems (a form of wet-ware). These thread structures were deposits of metallic iron inside colloidal cells. The strategy was to start with a plastic medium with a rich set of possible structures. Guided by an appropriately structured reward system, the medium was allowed to self-organize until the elements could self-proliferate. The reward constraints molded these connections to form a functioning artifact.

So how does this artifact challenge the restrictive, almost-Manichean notions surrounding the concept of computing machines? More importantly, what alternative design epistemologies emerged through these experiments?

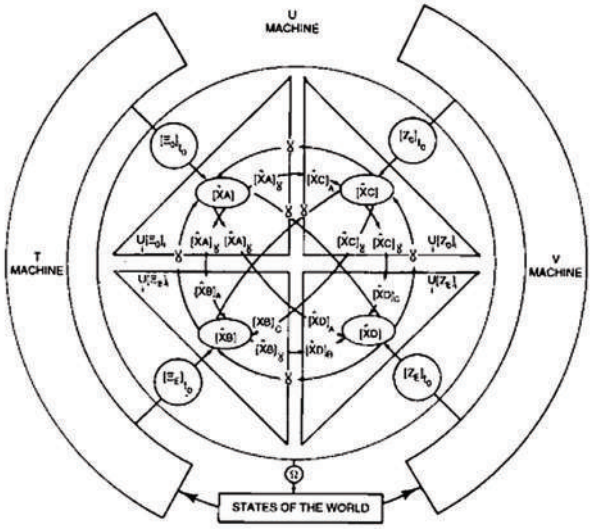
Design Agency: Meeting the Universe Halfway

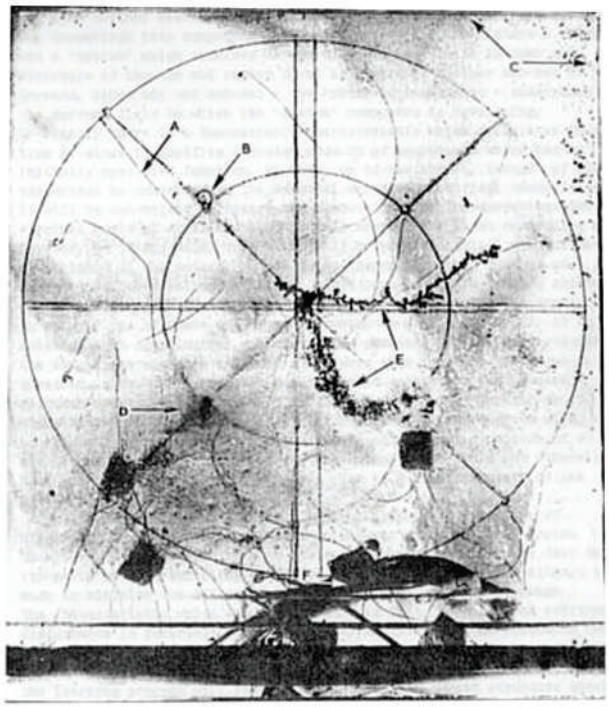
An assemblage of weird sorts is presented here, weird in that it escapes straightforward classification.[26] We have an artifact which is at once the designer and the object of its design. It is part-animal and part-machine, and can be viewed temporally as both the process itself and the outcome of that process. Each unit in the assemblage is holonic and entangled recursively in the workings of the system, challenging the traditional role of the designer and her competencies. As Pask states:

> [T]he design goal is nearly always underspecified and the 'controller' is no longer the authoritarian apparatus which this purely technical name commonly brings to mind. In contrast the controller is an odd mixture of catalyst, crutch, memory and arbiter. These I believe, are the dispositions a designer should bring to bear upon his work (when he professionally plays the part of a controller) and these are the qualities she should embed in the systems (control systems) which he designs.[27]

This complex question of agency is linked to what constituted 'life' in these design experiments. Many architectural theorists have tried to show the critical importance of understanding the central role that various theories of life now play or could possibly play in architecture. Catherine Ingraham uses the notion of 'animal life' as a trope to investigate this problem, drawing heavily from the post-humanist philosophy of Foucault, Agamben, Deleuze, and Guattari.[28] In so doing, she demonstrates that in contrast to the richness of the contemporary post-humanist discussions in other fields, architecture and its praxis traditions have reduced 'life' to the mere generation of a 'program' and an 'agency of the program' whilst saying almost nothing about what constitutes the agent. This strand of material experimentation shows the promise of second-order cybernetics and its ability deal with an agency of a far more complex variety than that of traditional humanism. It beckons us to question and challenge how we think of agency in the components that come together in a computational design system. Beer is particularly insightful in this regard:

> [M]an has become accustomed to regards his material as inert lumps of matter which had to be fashioned & assembled to make a useful system. He does not





Figs. 3-4: Stafford Beer's diagram of the U-machine Source: Harnden & Leonard (1994, p. 192). Reproduced by permission of John Wiley & Sons and Allenna Leonard.; Threads growing in Pask's chemical system. Source: Gordon Pask 1959, 919, fig. 12.

> normally think first of materials as having an intrinsically high variety which has to be constrained.[29]

This clearly shows that the designer's stance towards matter. Matter is not something to be controlled, but rather something that needs to be enrolled. Pask and Beer understood the complexities these interfaces might produce. They understood that letting the computer—like a pond or termite colony, etc.—and the factory search open-endedly for equilibrium would also be disastrous. Pask imagined a human manager training the controller. Demonstrating his budding interest in developing 'teaching machines' which became a significant part of his later research, he devised an appropriate reinforcement method of injecting pulses of current to help the machine 'learn' to deal with factory problems. While engaging in an inter-action which almost took the form of a game, the structured regions in the controller produced a pattern of behavior acceptable to the manager. This does not mean that the manager is completely satisfied with the behavior, but accepts it as a median reached through compromise and collaboration between the human and the non-human system. At this point the assemblage is ready to act as an 'organic control mechanism' and the structured region in the artifact will replicate indefinitely so that it will produce the same pattern of behavior, because a digital computer loses its functional value if it cannot execute the operations envisaged for it. These computers entail a much more fluid, almost 'conversational' relationship between the human and non-human components that come together to form the machine system. Kwinter's words can be used to describe this artifact:

> The computer and its software together can form a matter/intelligence unit of a very primitive but useful kind. But to do this, the computer, in the triad nature-mind-computer, must play only the appropriate interface between nature and mind. This will be a clear contradistinction to what is more often the case today, where computational environments provide a customary but imperceptible experiential envelope from which Nature (and all nondeterministic unfolding) is excluded and within which the activity horizon of the mind is confined.[30]

Hence the notion of 'life' was very different for these designers. As opposed to Christopher Alexander—a pioneer of the notion of genetic algorithms who questioned 'how do we generate living structures (life)?'—for Pask and Beer 'life' was about the 'relation,' living it as it went about its 'interactions.'

Most contemporary design processes in architectural studios are still driven by an almost scientific rationale of starting with an in-depth analysis of a system, the identification of a problem, and proceeding with a design to help circumvent that problem. The computer in these instances becomes a tool of exploring this linear method of problem identification and solution formulation. This experiment suggests that one could perceive the elements of a design problem as a series of black boxes and (rather than trying to analyze the system to see 'what it is') permit the design be the interface through which one understands the system and what 'it can become.' This is not an easy thing to do, particularly for designers accustomed to the practical comforts embedded in more linear processes – including Beer and Pask. In fact, Beer wrote in a diary entry 'I tell myself repeatedly that this thing is a black box in whose transfer functions I am not interested. Yet I repeatedly try to isolate experimental effects.'[31] Evinced here is an approach which starts from the middle, the relation, or, as Karen Bared would qualify it, a design approach where the designers are 'meeting the universe halfway.'[32] [fig. 5]

Designing Conversations: Coupling and Care

One of the central problems in these designs, which doubtlessly required a great amount of sensitivity on the part of the designers, lay in finding ways of getting the varying species (man, machine, and

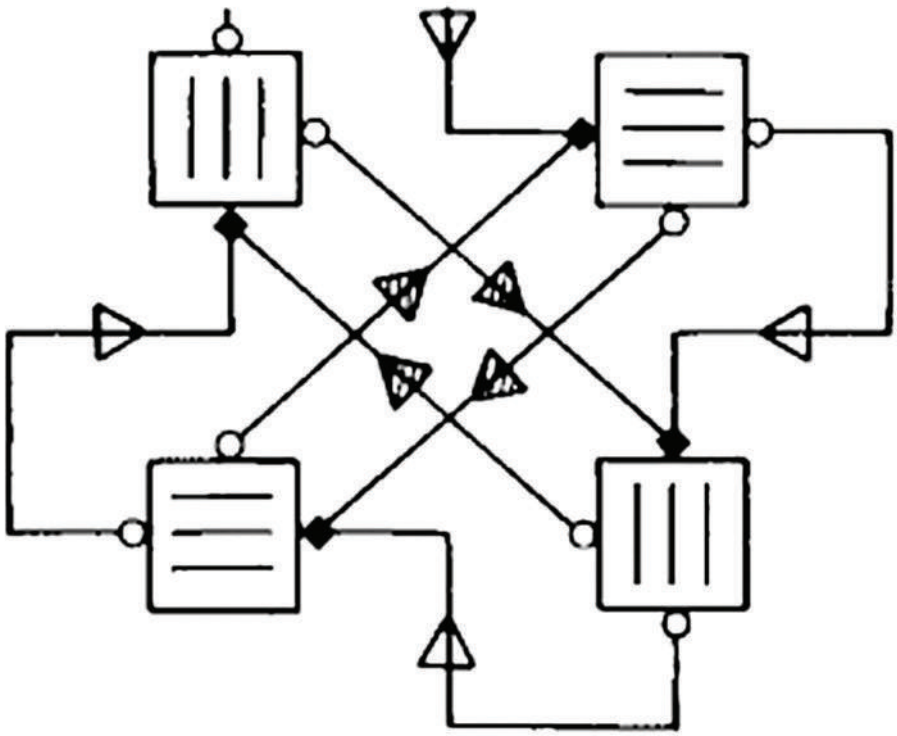


Fig. 5: Stafford Beer's sketch of the Euglena homeostat. Square, Euglena culture, with tropism displayed as shown; solid diamond, stimulus; circle, sensory receptor; hatched triangle, inhibiting influence, and, open triangle, stimulating influence, of a's sensation on b's stimulus. Source: Harnden & Leonard (1994, p. 30). Reproduced by permission of John Wiley & Sons and Allenna Leonard.

animal) in the assemblage to communicate with each other. They simply had to get these biological entities (i.e., a colony of daphnia) to 'care' about the state of a human factory. In this sense, one can see how the 'artifact' challenges the very basic definitions of 'care' as the concept is applied across a continuum of species both human and non-human. As the basic coupling device, the 'information feedback loops' become interfaces through which notions of care can be transmitted across systems. Knowledge about threshold conditions for each system became important in such devices. The variety of threshold states for human and non-human systems needed to be accommodated. They coupled these entities in ways that the health of each system could be made to hinge on each other through what is described as a process of 'reciprocal vetoing' which created a condition where the essential variables of both entities remained within preferred limits in their mutual interaction.[33] This is quite demonstrative of the forms of co-existence this project promoted, as well as where this project began to fail.

Beer's attempts at coupling the factory with daphnia are very well-documented. Iron filings were included with dead leaves in the tank of daphnia, which ingested sufficient of the former to respond to a magnetic field. Yet, this created a lot of problems. 'The most serious of these was the collapse of any incipient organization—apparently due to the steadily increasing suspension of tiny permanent magnets in the water.'[34] As Pask would say, the ongoing 'conversations' or 'language' in these bio-computing assemblages is considerably different from its meaning in discourse on humanism which describes it is as something that institutes an ontological difference between human and non-humans. 'Language' in this case instead becomes a human prosthesis or machine that is a subset of a larger domain of meaning which includes many non-linguistic forms of communication not restricted by the human domain alone. Hence, as opposed to the representational language notions prioritized within digital discourse in architecture, this alternative model allows designers to describe how meaning is made in recursive exchanges across previously discreet domains (like humans and animals entangled within these bio-computing assemblages). This is perhaps closer to definitions of 'communication' by a diverse genealogy of second-order system thinkers like Gregory Bateson and Francisco Varela.[35]

Rethinking the Boundaries of Self-Technologies and Self-cultivation

The strangeness of these experiments makes one question of the almost extraordinary sensitivity of their designers towards the 'non-human' world. Considering how loaded Beer's writing is with spiritual references, one could not help but wonder whether his engagement in various modes of self-cultivation practices influenced his design approach.[36]

It might be of surprise to modern designers to realize that Beer's schematic diagrams has a striking resonance to images of *mandalas* inspired by his personal meditational practices. The mandala itself is a performative machine: although drawn on a two-dimensional surface it is read in a process-like manner. By embodying the mandala, trained meditators could access altered states of consciousness or achieve a sense of separation from the self. Indeed, Beer was fascinated with various forms of eastern meditative praxis traditions ranging from Indian Vedanatic philosophy and Zen Buddhism to tantric yoga. In his most complete essay on spirituality, *The Knowledge of God* (1966), Beer states:

> To people reared in a good liberal tradition, man in principle is infinitely wise, he pursues knowledge to its ultimate […] To the cybernetician man is part of a control system […] His input is grossly inadequate to the task of perceiving the universe […] there is no question of 'ultimate understanding' […] it is part of

> the cultural tradition that man's language expresses his thought to the cybernetician language is a limiting code in which everything has to be expressed. Mores the pity, for the code is not nearly rich enough to cope.[37]

There is a humble acceptance on the part of these designers on the limited role they play in creating these assemblages. Unlike digital computing which takes the human brain's representational abilities as a model for knowledge, these bio-computing assemblages were interested in creating a mind—alternatingly part human, animal, machine, and more—which could never be folded into neat categorization. This work reflects his own effort to transcend the 'Western principle of Aristotelian non-contradiction (A/not-A) -meaning that a thing cannot both be itself and not itself at the same time-which he perceived as one of the most serious epistemological errors of Euro-centric knowledge structures.[38] Here one is reaffirmed of the transversal nature of the cybernetic loop in its ability to bring together in one place these different ways of connecting 'environmental' and 'social ecologies' with the 'mental ecology' or thought processes of the designers.

Hence we end where we began, with the need of addressing the polar epistemological positions (A/not-A) which are often associated with computing machines. It is hoped that the account of these experiments in their sheer strangeness and defiance of neat categorization will serve to make the reader question the preexisting epistemologies they may take for granted, so that in their next encounter with a 'machine' they may be able to see in it as Guattari (1995) did, 'something that would not be of the order of the soul, human or animal, but of the order of proto-subjectivity, both a relationship in to itself and a relationship to alterity.'[39] Such a shift to a more 'relational mode' of thought is needed in light of the current ecological crisis.

Notes

1. A cybernetic artifact particular in relation Pask and Beer's work is a device or a machine that mimics an aspect of human behavior. See Gordon Pask, *An Approach to Cybernetics* (London: Hutchinson, 1961), pp. 114. This suggests that these machines are considered by some to be the first biological computers which tried to mimic the brain as a performative organ and not a cognitive informational representation and processing device. Hence Andrew Pickering relates this lineage of experimentation to a performative idiom of scientific knowledge. See Andrew Pickering, *The Cybernetic Brain* (Chicago: University of Chicago Press, 2010).
2. The majority of these 'fungoid devices' were designed by Gordon Pask.
3. Andrews Pickering, *The Cybernetic Brain* (Chicago: University of Chicago Press, 2010).
4. Peter Carini, 'To Evolve an ear: Epistemological implications of Gordon Pasks electrochemical Devices', *Systems research 10:3*(1993), pp. 19-33
5. Gregory Bateson, *Mind and Nature: A Necessary Unity* (New York: Dutton, 1979).
6. Catherine Ingraham, 'Towards a New Theory of Life in Architecture-lecture at the Harvard GSD'. <http://www.youtube.com/watch?v=Yxq-UATMV5o> [accessed 02 September 2014].
7. Jonathan Crary & Sanford Kwinter, eds., *Incorporations* (New York: Zone Books,1992), p. 14.
8. For a detailed account of the influences of the post-war 'organizational complex,' see Reinhold Martin, 'The Organizational Complex: Cybernetics, Space, Discourse', *Assemblage,* 37(1998), pp. 103-27.
9. Christopher Alexander, *Notes on the Synthesis of Form* (Cambridge: Harvard University Press, 1964).
10. *A Communications Primer*, Charles Eames and Ray Eames (1955).
11. Carl Chu, 'Metaphysics of Genetic Architecture and Computing' (2012). <https://thecontemporaryarchitecture.files.wordpress.com/2012/02/karl-chu_metaphysics-of-genetic-architecture-and-computation.pdf> [accessed 08 August 2014].
12. Gregory Bateson, *Steps to an Ecology of Mind*

(Chicago: University of Chicago Press, [1972] 2000).

13. Ibid. See also Fritjof Capra, *The Web of Life: A New Scientific Understanding of Living Systems* (New York: Anchor Books, 1996).
14. The word 'estrangement' is used in the same sense as 'cognitive estrangement,' which is used to describe science fiction where by imagining a strange world one learns to see their own world in a different perspective. See Patrick Parrinder, *Learning from Other Worlds: Estrangement, Cognition, and the Politics of Science Fiction and Utopia* (Durham: Duke University Press. 2001).
15. Antoine Picon, *Digital Culture in Architecture: An Introduction for the Design Professions* (Basel: Birkhäuser, 2010).
16. Andrew Pickering, *The Cybernetic Brain* (Chicago: University of Chicago Press, 2010). See also Peter Galison, 'The Ontology of the Enemy: Norbert Wiener and the Cybernetic Vision,' *Critical Inquiry,* 21-1 (1994), pp. 228-66.
17. Peter Harries-Jones, *A Recursive Vision: Ecological Understanding and Gregory Bateson* (Toronto: University of Toronto Press, 2002).
18. Gregory Bateson & Margret Mead, 'For God's Sake, Margaret, A Conversation between Stewart Brand,' *Co-Evolution Quarterly* 10, (June 1976), pp. 32-44. See also Martin Buber, *I and Thou* (Edinburgh: T & T. Clark, 1970).
19. Félix Guattari, *The Three Ecologies* (London: Athlone Press [1989] 2000).
20. Jean Pierre Dupuy astutely points out that Ross Ashby's work – regardless of his tendency to mechanize life by claiming that there was almost no discontinuity in the world of the machine and the organism – had a considerable influence on the shift in cybernetics from the first to second-order formulations. His later work included a proof claiming to show the impossibility of self-organization formulated by Ross Ashby in 1962 influenced many key figures like Heinz von Forester and Henri Atlan to reconceive self-organization in a way that would get around the obstacle posed by Ashby's argument. See Jean Pierre Dupuy, *The Mechanization of the Mind: On the Origins of Cognitive Science* (Princeton: Princeton University Press, 2000), pp. 148-52. See also Stuart Umpleby, 'Ross Ashby's General Theory of Adaptive Systems,' *International Journal of General Systems* 38 (2009), pp. 231-8.
21. Ross Ashby, *Design for a Brain* (London: Chapman Hall, 1956), p. 1.
22. The same theory of adaptive self-organization discussed in the *design for a brain* has been used elsewhere in architecture, in a very different way, by Christopher Alexander. In his early work the *Notes on the Synthesis of Form,* Alexander used the idea of selecting the right variables in design processes to mechanize and rationalize the whole design process, breaking it down to a series of steps explicated in the design methods movement of the 1960s. See Alise Upitis, 'Nature Normative: Design Methods Movement (1944-1967),' (unpublished doctoral thesis, Massachusetts Institute of Technology, 2008).
23. For a graphical explanation, see Stafford Beer 'A Progress Note on Research into a Cybernetic Analogue of a Fabric,*' Artoga*, (1962) reprinted in Roger Harnden and Elena Leonard, *How Many Grapes went into the Wine* (Chichester: John Wiley and sons, 1994), p 26.
24. Ranulph Glanville, *Freedom and the Machine,* Ranulph Glanville inaugural lecture, Bartleet international lecture series. <http://www.youtube.com/watch?v=Z8g7GA6DEU8> [accessed 01 September 2014].
25. Harnden and Leonard, *How Many Grapes went into the Wine*. T machine- the brain artifact device which receives processes and analyses sensory input. (p. 184), V-machine-the brain artifact device which receives, processes and analyses motor input (p. 188), Both T machine and V machine are devices for organizing afferent (T-machine)and efferent(V-machine) experience. They are capable of organizing this experience under too modes: organismal and environmental. This fourfold system is balanced by the U machine in such a way that the organism and the environment remain in mutually acceptable states. The U –machine monitors all these activities in relation

to sensory gestalten. The output of the U machine is a monitoring signal that feeds back approbation and disapprobation to the world picture itself, into its own input (p. 190).

26. With the term 'assemblage' one could also think about Deleuze and Guattaari's use of the term 'machinic agencements.' The French term '*agencements*' is often translated in English as 'assemblage'. See Gilles Deleuze and Félix Guattari, *A Thousand Plateaus* (London, New York: Continuum [1980] 2004).
27. Gordon Pask,'The Architectural Relevance of Cybernetics' in *Architectural Design* (Vol 39, 2009), pp. 494-6.
28. Catherine Ingraham, 'Towards a New Theory of Life in Architecture-lecture at the Harvard GSD'. <http://www.youtube.com/watch?v=Yxq-UATMV5o> [accessed 02 September 2014].
29. Harnden and Leonard, *How Many Grapes went into the Wine*, p. 209.
30. Sanford Kwinter, 'The Computational Fallacy,' *Thresholds-denatured*, no. 26 (2003), p. 91.
31. Stafford Beer, 'A Progress Note on Research into a Cybernetic Analogue of Fabric', p. 32.
32. Karen Barad, *Meeting the Universe Halfway* (Durham: Duke University Press Books, 2009).
33. For a detailed description of how the vetoing system worked see Stafford Beer, *Towards a Cybernetic Factory*, p. 208.
34. Stafford Beer, 'A Progress Note on Research into a Cybernetic Analogue of Fabric', p. 28.
35. Jesper Hoffmeyer, *A Legacy for Living Systems: Gregory Bateson as Precursor to Biosemiotics*. (New York: Springer, 2008).
36. Others who write about Beer's work like Andrew Pickering are equally fascinated by his interest in spirituality. Pickering goes on to claim that this represents Beer's non-modern approach to science where the two seemingly different notions of scientific knowledge and spirituality can be positioned in relation to each other. See Andrew Pickering, *The Cybernetic Brain*. My interest in this dimension of cybernetics comes from the study of Francisco Varela's discourse on meditative technologies and applying it within the context of architectural education. See Dulmini Perera, 'Rethinking Reflexivity in Design Studios: Selves in Design to Design of Selves' in *Proceedings* of the 19th Multi-conference on Systems, Cybernetics and Informatics: Special Track on Knowledge, Cognitive Science and Technologies (Forthcoming July 2015).
37. Stafford Beer, 'Cybernetics and the Knowledge of God,' *Month*, 34, (1965), pp. 294-5.
38. Stafford Beer, 'I Said You are Gods*', The Telihard Review* (1980), reprinted in Roger Harnden and Elena Leonard, *How Many Grapes went into the Wine* (Chichester: John Wiley and Sons,1994), p. 383.
39. Felix Guattari, 'On Machines' in *Complexity*, ed. by Andrew Benjamin, JPVA, No. 6 (1995), p. 8.

Biography

Dulmini Perera is currently a graduate student at the Faculty of Architecture, University of Hong Kong. She completed her B Arch degree at the University of Moratuwa, Sri Lanka and has taught and practiced in Sri Lanka for a few years. Her current research traces the historical influence of second order cybernetic theories of Heinz Von Forester, Gregory Bateson, Humberto Maturana and Francisco Varela on ecological theories of architecture (1964-2001). She is also experimenting with the potential applications of these second order theories within the context of architectural education.

Ecologies of Corporeal Space

Katharina D. Martin

The human body should always be understood as an ecologically functioning corporeal space. The body is the geographical area wherein medical praxis acts in a specific manner. First there is the gaze of the doctor, which is observing, intruding and productive at the same time. This gaze, professionalised with the help of technical instruments, is one crucial aspect in the reciprocal relationship between corporeal space and diverse and changing systems of knowledge. In the last two hundred years medical tools and devices have been a determining factor in establishing the body as a site for the production of new images and new fields of meaning. As such, it is important to consider medical practices, as well as the various techniques and the knowledge production involved, in terms of their coeval development. The history of medical diagnostics and treatment, after all, is a history of its media.

In this paper I will first present several epistemological aspects of (clinical) medicine and its practice. Next, I introduce an ecological notion of corporeal space, understood as a multi-layered 'milieu'. This is followed by an investigation of the various technical implications within the medical context from the angle of the interconnectivity between the different milieus or environments formed by matter and meaningful signs. The human body is active but stable – an ecological state, in a sense, or, more specifically, a stasis based on constant change. My argument aims to demonstrate that the different medical techniques and instruments function as a membrane between various corporeal spaces within different milieus. These different fields or milieus are constituted by the combination of meaningful signs, which do not yet form a system of knowledge, but rather an arrangement of relevant but a-signifying signals.

Surface and Depth

Regarding the historical changes within medical science and in particular the development of the clinic, one has to acknowledge the significance of the epistemological analyses by Michel Foucault in his *The Birth of the Clinic*, first published in French in 1963. For Foucault this publication was not merely about the century of the clinic's birth, but also, as its subtitle put it, about an 'archaeology of medical perception'.[1] Key aspects of his analysis are space, language, death and the act of seeing.[2] His study presents the development and methods of medical observation in a period of crucial changes. It recalls the history of the clinic, with its techniques of mapping symptoms and anatomical spaces. The chief goal of nosology as part of theoretical medicine in the eighteenth century was a comprehensive classification of all diseases. This motivated medical actors to let a disease unfold itself in the most free and natural way, after which they could describe the changes of the symptoms in detail and classify the disease correctly. The natural space for being ill was people's home of course, the everyday environment of their life.[3] In the course of the eighteenth century, however, it became a common practice to take a person who was ill and who lacked a supportive family out of his home and into a publicly financed

hospital.[4] The clinic, serving as both a hospital and a place for education, evolved into the preferred and most neutral site for the observation and treatment of people suffering from a disease. This marked a shift towards an understanding of medicine as an objective science and practice.[5] In classical medicine it was common practice to observe the patient thoroughly; or, put more precisely, medical actors described and categorised medical symptoms. The 'tableau' of classical medicine basically involved a straightforward set of classifications and structured data on families, genera and species. The medical gaze was deployed to observe some illness, after which it would be arranged, structured and put into a specific 'order' with the help of language.[6] A tableau, including extensive descriptions and structured information, became part of the interplay between the spoken and perceived. The similarity between a phenomenon and the symptoms classified resulted in a further step, in the essential moment of recognition of the disease in the tableau. Once the particular manifestations of some illness were linked to specific coordinates on the tableau, it took over the space of the body. The information on the outer body and its symptoms made its way into the flat language tableau, after which it also became 'apparent' in corporeal space. Merely the act of classifying involved perceptions that led to a productive mode of thinking in terms of particular codes. By connecting the medical gaze and language, a new medical system of knowledge was produced.

In the middle of the eighteenth century, the opening of dead bodies on a regular basis resulted in a growing amount of anatomical knowledge. Anatomical-pathology developed quickly as a body of knowledge and clinical diagnostics underwent great changes. If in classical medicine the dead body, regarded as the opposite of a healthy body, was believed to be of no further use to medicine, in anatomical-pathology the dead body served as a great source of knowledge for all further diagnostics. Earlier, in nosology, a disease was merely a bundle of characteristics on the surface of the body, but now the body could be horizontally and vertically penetrated to uncover the layered depth of its bulk.[7] The simple gaze of the doctor expanded into a comprehensive anatomical-clinical apparatus, based on the senses of sight, touch and hearing, which allowed one to map the living body.[8] As a result of this exploration of the inner space of the dead body, the living body turned into corporeal space as well. As Foucault states: 'For us, the human body defines, by natural right, the space of origin and of distribution of disease: a space whose lines, volumes, surfaces, and routes are laid down, in accordance with a now familiar geometry, by the anatomical atlas.'[9] A disease was no longer defined as a virtual ideal scheme, thus a theoretical tableau placed on the body. Rather, a disease was now embodied and locatable in corporeal space.

Efforts aimed at opening up the living body were not so much motivated by a desire for knowledge, but by the need to act within the corporeal space and treat malfunctions. In the early eighteenth century, most surgical procedures were amputations, which had to be done very quickly to prevent the patient from dying from excessive pain or loss of blood. With the discovery of anaesthetics around 1845 surgery in the modern sense became possible.[10] A patient under narcosis could be operated without pain, thus time was less of an issue and more complicated surgery became possible. The living body was silenced and the patient became merely a physical object. The living and fleshy organism, suspended in unconsciousness, could now be opened and entered without interferences. In surgery the patient is cut open wide, wide enough to see, to access, and touch the organs. In combination, anaesthetics and scalpels make it possible for the hands of the surgeon to enter the corporeal space and operate within it. Drawbacks of this invasive procedure include the damage resulting from the incision, the risk of infections and the time needed for recovery.

Although surgery has become a widely established and successful medical discipline today, it is not yet possible to operate and navigate entirely safely within the living human body. Ongoing research concerned with medical techniques has been driven by the aspiration to find enhanced methods which would guarantee secure navigation within the anatomical area, avoiding all unnecessary penetration. One example is the endoscopic technique which emerged in a primitive form already in the eighteen hundreds.[11] Using tools similar to binoculars or telescopes, which were based on the reflection on light from the outside, they entered the natural openings of the body. One way to reach the stomach, for instance, was by passing a straight, static tube through the oesophagus.[12] These endoscopic instruments were further developed, and the invention of the Edison lamp made it possible to bring light into the body. Regardless of whether we are dealing with the outside or the inside of the body, the question of visibility was – and still is – the most crucial aspect in diagnostics and treatment within medical practice.

The ground-breaking and fascinating discovery of the x-ray technique in 1895 made it possible for the first time to show details of the inside of a living body and also record images of it. For decades the photographs were exploited in popular culture, and since one of the first bone images showed Bertha Röntgen's hand, the x-ray of the female hand became a fetish object.[13] [fig. 1] It has always been common to apply technical apparatuses in unconventional ways, linked to the world of magic and occultism. The x-ray technique, for instance, has also been used in attempts to capture ghostly apparitions.[14] In this sense it is also possible to interpret media in a wider context than the one proposed by the cybernetic diagram.[15] The model of communication which assumes an information source sending a message to a transmitter, which is subsequently conveyed in an unaltered fashion to the receiver and its destination, is perhaps all too familiar. A medium is an agent between different areas of meaning; it submits, produces and/or shows new combinations of signs, which are to be understood as new information.

Regardless of the countless metaphorical interpretations and beliefs which came along with the sudden fact that it was possible to see the most intimate inner self, the x-ray technique was soon mainly understood as an objective, diagnostic tool. When in the late 1920s the x-ray technique made its way from the artistic studios of photographers into clinics, technologically produced medical images began to serve as an important tool for diagnosing illnesses at an early stage.[16] If the exploration of the dead body made it possible to establish a map of the living corporeal space, the x-ray produced an additional, new space, separated from the patient's body: patients could now be diagnosed without being present. Increasingly, the personal experience of the patient was rated as subjective and unreliable. As it became possible to show indications of a medical disorder within the space of the x-ray image, one no longer needed the corporeal space of an actual patient who was present. Furthermore, the doctor's gaze, including its various sensorial impressions, was increasingly replaced by visual evidence.[17] The perception, in other words, shifted 'from the subjective observer of the body to the intersubjective observer of mechanical induced representations of the body.'[18] With the help of a machine, and based on the patient's body, a new corporeal space had been produced. These new kinds of images correlate directly with the production of knowledge: they 'mold as well as reflect visual reality.'[19] More and more, the medical system of knowledge became pervaded by power, and to this day it is difficult to gain access to this system. Whoever has had the experience of having his body x-rayed will remember the 'moment of truth', when the doctor puts up the x-ray photo, looks at it and formulates a diagnosis. Even if the physician explains the image, or even if there is a clear fracture

of a bone which is easy to spot, it is still mystical and exciting to see a representation of one's own internal body. At the same time, many of these images are less transparent than they may seem to be. They need to be carefully interpreted by trained specialists before becoming a reliable source for medical diagnostics. Similar to the tableau with its tables, x-ray is '[…] a representative technology creating an illusion of unmediated, objective reality.'[20] At this point in medical history, the question of mediation began to present itself much more clearly. As indicated, to *mediate* means not merely to transmit, but to convert through diverse channels, and between different milieus. The media are always reshaping information and forms of information, even if one does not recognise the impact of the media's productive force. In this respect it is hardly surprising that the doctor who looks and listens had to give way to the specialist who relies on technology to see and intervene. Despite the fact that a technical image of the body such as an x-ray is strongly mediated, it is commonly seen to be superior to any subjective form of perception.

Parallel to the rise of this kind of technologically mediated diagnostics, the endoscopic procedure swiftly developed as well. By having more sophisticated optical equipment, a safe and reliable internal light source, and a flexible cable which could be passed between organs, the technique would prove to be more than just an extension of the eye of the doctor: it was also an extension of the hand of the surgeon. To have to make an incision to be able to enter the body with an instrument was a highly intrusive step. Anaesthesia was needed as well, which is why the procedure did not become common before the beginning of the twentieth century. At that same time the seeing device became a real instrument which functioned as an extension of the hand of the surgeon. Nowadays the technique is in many ways applied as a routine procedure. The entrance hole for the surgical device is small, and the instrument is able to show video images. As of the 1980s the recorded images of the internal body proliferated not only within the medical world; they also made their way into study colloquiums, art exhibitions, private homes and on the internet.[21] During the actual surgical procedure the camera feed is shown on a monitor, and it requires great skill and a lot of concentration on the part of the surgeon to work with these images. An additional source of information has to be monitored and interpreted, after which all the data have to be mentally transposed onto the patient's body.[22]

The general map of the physical space of the human body is no secret anymore, and with the evolving of technical media, highly detailed information can be gathered. Each measuring machine produces its own characteristic image and particular encryption. This in turn has prompted a need for specialists with diverse technical and visual skills. Digital augmented reality is a recently developed technique of image-guided and interactive training exercises and image-supported surgery. Due to a high digital image quality and interactivity, virtual training software can be of great benefit to students. But also during surgery it can be an advantage to be led by a virtual body. During endoscopic operations, the gaze of the surgeon is directed away from the body because the camera feed is shown on a monitor. This cognitive performance demands great discipline and extensive training. The projections of the augmented reality on the other hand make it possible to merge this additional information and help to reduce the workload or even shorten the time of narcosis. Already before the surgical procedure, many different data about the patient's physical condition has been gathered and can be used. Computer tomographic images or x-ray images are visually prepared and then projected directly onto the relevant body part. Tracking devices attached to the skin are connected to a wireless mouse, and they allow one to switch between different visualisations of the internal corporeal space.[23] Even if this method may extend the anatomical overview, it

does not give any sense of depth. Next, this was followed by the development of a system which produced an overlaying image with transparency and spatial presentation. When showing occluded objects, it was very effective to preserve the context of occluding structures by rendering just the edges. Very little of the occluded object is obscured by the thin edges, but there are enough visual cues to give a compelling sense of depth. The *Edge Overlay* visualization aims to provide depth cues when viewing sealed objects.[24] A perception of depth is achieved through including a 'window' without determined frames. In a certain area around the central image, the tissue becomes more transparent and therefore produces a spatial appearance. The clinical information is processed and prepared in order to be turned into a new image, making it possible to perceive a three-dimensional space. This field of the optical dimension is a field of mixed realties, and functions as membrane between the internal corporeal space and its cognitive and digital correlation. Based on the physical body of the patient, a much less encrypted internal image appeals to the gaze 'immediately' and instantly.

Homeostasis and Allostasis

To analyse the specificity of the entanglement between medical practice, its media and corporeal space, I will now introduce the notion of 'milieu'. Claude Bernard, the founder of modern physiology, scorned classic nosology and wanted to establish an 'experimental medicine'. His research of animal physiology was based on vivisection, surgery on living organisms conducted for experimental purposes. Bernard's work has been recognized primarily for his concept of the constancy of the 'internal environment'. This *milieu intérieur* is geared to stabilizing and maintaining the uniformity of the organism's conditions, so that it can pursue a free and autonomous life.[25] For instance, the *milieu intérieur* ensures a steady body temperature, and helps the body to adjust to the oscillating climate changes of the external environment, the *milieu cosmique*.[26] This process, also called homeostasis, describes the sufficient regulation of the physiological adaptations necessary for internal stasis. The control of temperature, pH, glucose, protein, oxygen, sodium and calcium are important examples of these regulatory responses to the systemic physiological requirements. As argued in recent research in the field of neuroscience, however, Bernard misjudged the environmental context and overrated the separation of the internal milieu from the external world.[27] Every species has to balance the internal demands with external contexts, suggesting that the concept of homeostasis was defined too narrowly. Since it proved impossible to explain the observed adaptations by the homeostatic concept only, several different theories have been developed. Today's research emphasises that a viable stasis cannot be accounted for by physiological adjustments only, as behavioural ones are equally relevant. The concept of 'rheostasis', for instance, includes a wider range of biological systems, taking into account variations tied to context, season and surroundings. Considering reactive and predictive homeostasis, it does include physiological and behavioural regulations, giving rise to a notion of 'physiology of change'.[28] An alternative neuro-scientific concept, 'allostasis', was introduced to acknowledge the change of state as a prerequisite for viability. Allostasis comprises both the behavioural and physiological processes that maintain internal parameters for the essential requirements for life. The concept acknowledges the impact of an external (social) space, and it is considered a plausible hypothesis for connecting events which might seem to be unrelated at first glance.[29]

If we want to follow up on the notion of a connected internal and external milieu, we should turn to Jacob von Uexküll and his concept of *Umwelt* (surrounding world or environment). In his theoretical biology[30] and theory of meaning (*Bedeutungslehre*),[31] Uexküll emphasises the

importance of a subject-oriented epistemology, which he based on his biological research.[32] A significant aspect is the reciprocal relationship between an autonomous organism and its geographical environment, on which each unique milieu is based. Especially well known is Uexküll's example of the tick, which was enthusiastically taken up and propagated by Gilles Deleuze and Félix Guattari.[33] The sunlight, the smell and the temperature of the skin, as well as the resistance of the hair, are the few relevant signs composing the tick's *Umwelt*. A unique composition of preceptor and receptor signs within the body and the surrounding environment constitutes a particular *Umwelt*, and the reciprocal connection within it is the functional cycle of meaning.[34] To assign significance to elements in the environment is not a question of the developmental stage of the animal involved. All organisms – be it a human being or some microorganism – share the ability to distinguish between noise and signal, as well as the ability subsequently to respond to what biologically is relevant.[35] Based on many different examples, Uexküll demonstrates that the cycle is organised by perceptive and receptive signs.[36] The main point is that the organism does not respond to causal impulses, but to perceptual signs or meaning.[37] The subject's *Umwelt* is assembled as a reciprocal relationship within a shared field of meaning. One further aspect of Uexküll's concept is the already genetically related surroundings. In the 'internal front' one can find imprinted images of the external world.[38] The subject is surrounded by vital counterpoints with respect to active images. Uexküll elaborates this aspect when he describes the spider's net. The fly, never seen before by the spider, is present as a primal image. This *Urbild* is the form on which the spider is able to build the perfect net for the hunt.[39] The net is a well-made mould of the fly, so to speak, and it would not exist in this way without the fly's concrete characteristics.

In this context it might be helpful to note that milieu or environment should not been confused with a fixed geographical space which can be easily determined. Although the 'milieu' is part of the space, it is defined by being an assembled multi-layered realm of matter, signs and meaning. The cycles of meaning (signs) each have a certain mode or style and their own particular semiotics. In most cases they undergo slight changes all the time, and to identify its temporal state is an act of intervening already. But we need a further element to grasp the moment of ecological change with respect to processes of exchange. In the analyses of Francis Bacon's paintings, Gilles Deleuze identifies three core elements: structure, figure and contour. 'This contour, as a "place," is in fact the place of an exchange in two directions: between the material structure and the Figure, and between Figure and the field. The contour is like a membrane through which this double exchange flows.'[40] Deleuze does not talk about a fixed system with respect to form, with boundaries which stabilise a self-preserving and organised system against a hostile and fluctuating environment. His concept contradicts with recent system theories, which rely on the differences between a complex environment and an operated superior order.[41] The contour is not a boundary without processes of exchange between the different layers. In this respect, Deleuze refers to Gilbert Simondon when providing us with a concept of 'figure' and 'ground' within the same field. The form individuates in phases and Simondon connects this concept to processes of life. He leaves behind the classic notion of form and developed a concept of *in*formation, which allows him to couch a specific theory concerning becoming.

The three aspects identified by Deleuze – form, structure and contour – are layers which can establish a milieu. As Deleuze and Guattari write: '[t]he living thing has an exterior milieu of materials, an interior milieu of composing elements and composed substances, an intermediary milieu of membranes and limits, and an annexed milieu of energy sources and actions-perceptions.'[42] To

conceive of the human body as a milieu, a corporeal space which is changing its reciprocal relations, implies a shift in the angle of this investigation. We can now look at the inflictions concerning corporeal space, medical practice and the involved media.

Symptomatology

I will attempt to apply the ecological concept of milieu and revaluate the examples of medical techniques discussed above. In medical practice we deal with differently coded fields and one can recognise that the ecology of corporeal space concerns the gaze and the language of the doctor, the intruding scalpel and hands of the surgeon, as well as the mediated images of the body. In each case one can find a certain kind of porosity between diverse fields of meaning. Next to the act of cutting the skin and touching the organs, there are many other intersections between surface, internal space and environment. Tableaus, x-ray photographs, brain scan images or even the printed curve of an electrocardiography are highly induced new forms of information correlating between the physical body and the particular abilities of the measuring instrument. In each case one finds the corporeal space expanded into different milieus.

First there is the directed gaze of the doctor, near to the body, mapping the outside space and its symptomatic signs. The next crucial step is the act of converting the body's code, translating it and customising its signs. By translating symptoms into language they are being introduced into a different field of meaning, thus into a new milieu. During this process, certain recognisable collections of symptoms are identified and named. In so doing, diseases are being configured, and a new knowledge system, including a particular concept of illness, has been produced. Really fascinating is the reciprocal dimension found in this process. Identification of a set of symptoms on a patient gives rise to a diagnosis. The patient now has a disease, and this becomes evident in his corporeal space. The body, besides having its fleshy milieu with its own symptomatic signs, is now also part of a differently coded field of signs: the system of illnesses. Just as the fly is the counterpart for moulding the spiders net, the patient's body is being 'framed' by the system of medical knowledge. In most cases the subjective symptoms of the patient and the technical image are each other's counterparts. The x-ray photo, for instance, offers a two-dimensional image of the three-dimensional body. The photos are made with the help of non-visible radiation. The radiation actually has to cross the body to shape the image. In that sense, the body functions as a counterpart by definition. But the machine, or its particular technical functioning, is responsible for the characteristic shape of the image. There is a reciprocal relationship at work between the patient's body and the x-ray machine. The x-ray image shows its own productivity, due to the conditions of the machine. As a result there is a correlating technical body image, which is geographically separated from the physical space of the patient's body.

The actual cutting of the skin to open the body might be the most obvious act of crossing between milieus. We know that a certain stasis is necessary to keep the organism alive. This securing state, however, seems to be based on constant changes and adjustments. During the phase of a life an organism has to deal with diverse environmental situations, caused by changing seasons with many weather and climate variations. Furthermore, there is a strong influence by changing social and physical interactions with other organisms. Each situation is balanced by a combination of different means dependent on each unique person's abilities. During and after an open surgery, the body is reacting strongly but very often it is also able to cope with the situation and restore a 'healthy' stasis. Still, it is an understandable desire to want to enter the internal milieu of the organism without opening the skin (contour or membrane). In fictions one can find fantastic stories of travelling through

Fig. 1: Photographed by Wilhem Conrad Röntgen 1895, 129 x 178mm, Celloidpapier, Remscheid Sammlung Deutsches Röntgen-Museum © public

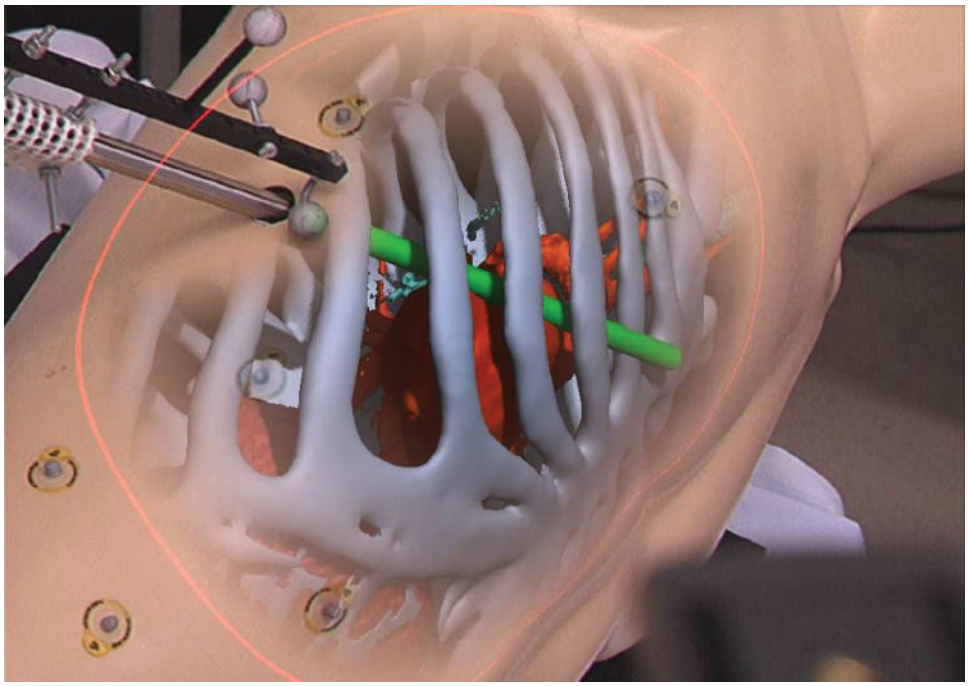


Fig. 2: Virtually extended instrument within a thorax phantom. In Christoph Bichlmeier et.al., 'Contextual Anatomic Mimesis, Hybrid In-Situ Visualization Method for Improving Multi-Sensory Depth Perception in Medical Augmented Reality' <http://campar.in.tum.de/Chair/PublicationDetail?pub=bichlmeier2007Mimesisismar> [accessed: 21 April 2014], Reprint with friendly permission by Christoph Bichlmeier.

the body: the internal milieu is turned into ‘space’, which can be entered for an adventurous trip. These kinds of stories are usually about a crew and a ship shrunken to a microscopic size, which enters the body through the mouth. Or the travellers will follow the blood circulation system through the organs, using a tear to exit the body again.[43] The internal organic space is presented as the unexplored and infinite outer space. This genre of fictions reflects on the scientific challenge of visiting the internal space of the body without even being noticed. The endoscopic technique in fact comes quite close to this ideal. If an incision is needed, it tends to be very small, while the instrument is sterile and flexible. To place the view of the doctor inside the body appears almost like a visit without leaving traces. The secret gaze inside is nevertheless a productive one, reflected in the parallel video feed on a monitor. The surgeon’s gaze is not directed towards the patient’s corporeal space, while he or she is guiding the endoscopic instrument with the help of the image displayed on the monitor. In that sense the surgeon operates within the corporeal space of the video feed. Based on the camera’s mediation, the patient’s body manifests itself in an additional geographical place, and becomes part of a different system of signs. Today’s endoscopic surgery replaces images not only geographically; it also translates them into digital form. [fig. 2]

The patient’s corporeal space does not only exist in its fleshy physical form, but also within the video feed of an endoscopic instrument, or a digital illustration. In the case of these new graphical images, all visual information is based on the digital system as a particular way of computation. The digital form is without further expression or flexible relationships and always formatted. It should be stressed that it is possible to directly address a particular pixel without having to traverse the precursor. The pixels, due to their continuous addressability, are more text than image and the computer graphics is therefore quite easy to manipulate.[44] In fact, it is not just possible to manipulate images, but also to produce entirely new images. Of course, these new images are an integral part of reality, and shall not be dismissed as a virtual and therefore less relevant part of the world. The complications between the digital and analogue domains reveal themselves in the area of the optical and the sensory realm.[45] One should give attention to the image as part of a mixed reality, since the sensory realm respectively optical field is the place where transcoding proceeds. Augmented reality is like a membrane between digital code and human perception. Even if the computer graphics is entirely based on digital information, by generating an image which can be interpreted, which can be seen and spatially perceived, the digital information provides analogue stimuli. The digital realm of coding basically produces actual corporeal spaces while at the same time maintaining their milieu constituted by digital structures.

The world of medical practice, with its intrusive instruments and diagnostic visualisation machines, is marked by an array of intersections between different milieus. There are plenty examples where the organic body is pervading its corporeal space into the technical milieu. Even without quoting Spinoza, or without quoting Deleuze quoting Spinoza, it is possible to argue that the body is capable of yet unknown ecological events. But one should be wary to claim completeness when investigating these ongoing ecological processes. To grasp the multiplicity and the infinite character we do not need to pursue exhaustive historical research, but merely point to observable intersections. This paper can be understood as a speculative but nevertheless practical and realistic approach towards an ecological understanding of the body. And yes, the ecology of corporeal space does not end with its own organic area and symptomatic signs. Next to the codes of the flesh, there is a field of meaning which is based on medical instruments and media, systems of language and the rhythm of the digital code. The body as an ecological form is able to expand its

range from a collection of subjective signs into the encrypted field of medical knowledge and digital formations.

Notes

1. Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception* (London: Routledge, 2002).
2. Ibid., p. ix.
3. Ibid., pp. 39,40.
4. Ibid., p. 40.
5. Ibid., p. 109 ff.
6. Ibid., pp. 60 ff.
7. Ibid., pp. 135 ff.
8. Ibid., p. 164.
9. Ibid., p. 3.
10. Ludwig Brandt, *Illustrierte Geschichte der Anästhesie* (Wissenschaftliche Verlagsgesellschaft, 1997).
11. José van Dijck, *The transparent body: a cultural analysis of medical imaging*, (Seattle: University of Washington Press, 2005), p. 66.
12. Ibid., p. 66.
13. Ibid., pp. 84,89.
14. Eugene Thacker, 'Vermittlung und Antivermittlung', in *Die technologische Bedingung: Beiträge zur Beschreibung der technischen Welt* (Berlin: Suhrkamp, 2011), pp. 306-32.
15. I refer to the diagram of the communication model by Claude Shannon and Warren Weavers. Ibid., p. 306.
16. Dijck, *The transparent body*, p. 84.
17. Ibid., p. 86.
18. Ibid., p. 98.
19. Ibid., p. 98.
20. Ibid., p. 98.
21. Ibid., p. 71.
22. Marcus Tönnis, *Augmented Reality: Einblicke in die Erweiterte Realität* (Berlin, Heidelberg: Springer, 2010), pp. 132-40.
23. Ibid., pp. 132-40.
24. Ibid., p. 133.
25. Claude Bernard, *Leçons sur les phénomènes de la vie communs aux animaux et aux végétaux* (Paris, J.-B. Baillière, 1878), pp. 112 ff.
26. Ibid., p. 117.
27. Jay Schulkin, *Rethinking homeostasis: allostatic regulation in physiology and pathophysiology* (Cambridge, Mass.: MIT Press, 2003), p. 2.
28. Ibid., p. 16.
29. Ibid., p. 21.
30. Jakob von Uexküll, *Theoretische Biologie* (Frankfurt: Suhrkamp, 1973).
31. Jakob von Uexküll and Georg Kriszat, *Streifzüge durch die Umwelten von Tieren und Menschen: ein Bilderbuch unsichtbarer Welten* (Frankfurt: S. Fischer, 1970), p. 107.
32. Torsten Rüting, 'History and significance of Jakob von Uexküll and of his institute in Hamburg', *Sign Systems Studies* 32.1/2 (2004), pp. 35-72 (p. 49).
33. Uexküll and Kriszat, *Streifzüge durch die Umwelten von Tieren und Menschen*, pp.6 ff. Cf. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (Minneapolis: University of Minnesota Press, 1987), p. 51.
34. Uexküll and Kriszat, *Streifzüge durch die Umwelten von Tieren und Menschen*, p. 118.
35. Ibid., p. 15.
36. Ibid., p. 118.
37. Ibid., pp. 9,127. Cf. Paul Bains, *The Primacy of Semiosis: An Ontology of Relations* (Toronto: Toronto University Press, 2006).
38. Uexküll und Kriszat, pp. 133,158,167,171.
39. Ibid., pp. 126,159.
40. Gilles Deleuze, *Francis Bacon: The Logic of Sensation* (Minneapolis: University of Minnesota Press, 2005), p. 15.
41. Friedrich Balke, 'Auf dem Rundgang Bilder des Lebens bei Francis Bacon, Gilles Deleuze und Martin Heidegger' in *Struktur, Figur, Kontur: Abstraktion in Kunst und Lebenswissenschaften*, ed. by Claudia Blümle and Armin Schäfer (Zurich and Berlin: Diaphanes, 2007), pp. 317-8.
42. Deleuze and Guattari, *A Thousand Plateaus*, p. 313.
43. José van Dijck, *The transparent body: a cultural analysis of medical imaging*, pp. 64 ff.
44. Kittler, Friedrich: 'Computergraphik. Eine halbtechnische Einführung' in *Mimetische Differenzen: der*

Spielraum der Medien zwischen Abbildung und Nachbildung, (Kassel: Kassel University Press 2002), p. 221-40.

45. Colebrook, Claire: *Blake, Deleuzian Aesthetics, and the Digital*, (London, New York: Bloomsbury Academic 2012), p.vii.

Biography

Katharina D. Martin studied media art and aesthetics in Germany and The Netherlands. She is a PhD candidate in the Department of Aesthetics and Art Sciences at the Academy of Fine Art Münster, Germany. Martin is concerned with a new kind of trans-disciplinary philosophy and media studies. Her research gravitates around the concept of ‘milieu’ as a methodological instrument for analyses of digital technology.

Delirious Impulses: A Logic of Erratic Excess in Harmony Korine's Spring Breakers

Halbe Hessel Kuipers

> Every delirious formation appropriates extremely varied milieus and moments, with which it links up in its own manner. (Gilles Deleuze, 1993)[1]

The recent film directed by Harmony Korine *Spring Breakers* is arguably a cartography which maps out what can be called a logic of erratic excess.[2] In a form of capitalism that has overcome the logic of totalizing normality and that has adopted instead a logic of erratic excess, everything revolves around novel differences, 'the more varied, and even erratic, the better.'[3] The protagonists of *Spring Breakers* are longing and searching for precisely such novel differences, going to extremes to attain it. Such capitalism has started to intensify and diversify affect, to extract surplus-value. Affect is valorized. [4] The protagonists, or simply, 'the girls' ravish in intensity, or what they call 'genuine experience'. In a capitalism that is facilitated by the virtual reality of the screen culture, such experiences are as well to be found through the engagement with digital technology; what Simon Reynolds calls 'nomadic eclecticism'.[5] *Spring Breakers* embodies this engagement with the digital environment, as it 'is the neorealism of the Facebook age, chopped, screwed, and digitized. […] Spring Breakers is the embodiment of such technological engagement. It is everything that we are today.'[6]

Then, how do the girls go about in affirming the longed for novel differences? And within this logic of erratic excess, how does this procedure relate itself to the object that is engaged with in order to attain the novel difference?

Precisely because of an erratic logic of excess and its dependency on affect (pre-personal intensity), this film can be approached aesthetically through the philosophy of Gilles Deleuze. This approach allows for understanding this logic in terms of continuity in discontinuity, that is, the disruption of the sensory-motor schema.[7] Through this approach, it becomes possible to see that *Spring Breakers* and its logic of erratic excess is a direct confrontation with the madness of the current digital era.

In what follows, I intend to show that there lays an aesthetic strategy at the core of the girls' behavior in order to achieve such novel difference. This strategy is one of acceleration wherein they push life to its limits. The acceleration invokes an exhaustion of the whole, which encompasses both self-exhaustion and exhaustion of the other. Given the proper conditions, this gives way to a full-fledged delirium, in which discontinuity is found in continuity, allowing for a novel whole to be produced alongside its parts. I argue that this delirium is of a specific formation integral to digital visual culture.

Milieux

From the college milieu to the gangster-rapper milieu; from a safe but boring milieu to a dangerous but exciting one: the four girls in *Spring Breakers* – Britt, Candy, Cotty and Faith, played respectively by teen stars Ashley Benson, Vanessa Hudgens, Rachel Korine and Selena Gomez – make a tremendous

shift as they encounter and ultimately indulge in the gangster milieu. Coming from the college milieu, the girls are used to a rather dull life: the monotonous tone of their daily lives is exhausting. It is exhausting because in its lingering and repetitive nature it only depletes itself. Still, they try to entertain themselves – hanging, playing – but it all adds up to little more than small pleasure. In their minds, the spring break event is exactly what they need: something to intensify their daily lives with. So they go there. Here, at some point, they will be confronted with the gangster milieu, which will protrude into their milieu during the partying. It will introduce the girls, through the enticing appearance of Alien – played by James Franco – to something completely different, by which they attain a novel difference or a 'genuine experience'.

The encounter between these two diverse milieux raises the question of how they will relate to each other. Does the encounter with the other milieu invoke an 'eating of the other', wherein the dominant party assimilates the other?[8] To phrase it differently, is it a relation of exhausting the other, or does it somehow relate itself differently to the other?

For the neoliberal subject, facilitated by the virtual reality of screen culture, the relation with the other does no longer necessarily have to be one of eating and thus exhausting the other.[9] Rather the relation has become one where pleasure 'comes not from assimilating difference […] but from optimizing one's individual capacities.'[10] The neoliberal subject does not necessarily exhausts that which it comes into contact with. Rather a process of modulation is invoked wherein it uses the found intensity to find novel differences.[11] Such a relation has moved away (at least in part) from identity politics, where the hegemonic subject appropriates (synonym to eating) the other, uses it for its own good, depletes it (hence eating is such good imagery) to then discard it.

Marx noted that capitalism functioned like a vampire in its appropriation of labor: 'dead labor, that, vampire-like, only lives by sucking living labor, and lives the more, the more labor it sucks.'[12] But in the move from 'formal subsumption' to 'real subsumption' everything that we do and live has become subject to the vampire-like force of capitalism, not just our labor.[13] Or as Steven Shaviro puts it, 'We have moved from a situation of extrinsic exploitation, in which capital subordinated labor and subjectivity to its purposes, to a situation of intrinsic exploitation, in which capital directly incorporates labor and subjectivity within its own processes.'[14] This means that everything is being fed on, and it becomes impossible to appoint the vampire because even the vampire gets sucked dry in the process.

In this situation it is easy to see how the mechanism of eating the other (or exhausting the other) has been subverted, as no action goes without exhausting the self that takes the action. But this then leaves the question how the neoliberal subject can go into a process of modulation that leads to novel differences?

If we put this question in terms of affect, it becomes one of aesthetics. In Deleuze's concept of the impulse-image he describes how impulsive actions – strong actions towards a desired goal – result in the exhaustion of the other, but also in the exhaustion of affect.[15] Here, according to Deleuze, movement always appropriates affect, invoking linear time, and it does so to such an extent that it literally degenerates affect. In this sense the novel difference lies in pure affect, affect not subjugated by the sensory-motor schema, which is completely opposed to mechanical repetition. Modulation must then be a process that disrupts this model, and somehow does *not restrain* affect; any process restraining affect fails to affirm the novel difference and fall back into exhausting the other.

Fig. 1: Spring Breakers (2012) Poster. Copyright by production studio and/or distributor. Intended for editorial use only.

The girls are a prime example of an aesthetic way of affirming this novel difference. In engaging with the technology inherent to their milieu, they find a way to modulation through another milieu. That is, in interacting with the gangster milieu they do not simply exhaust it, they engage with it to create a novel connection. But how is that attained? How are they dealing with their own impulsive behavior towards this genuine experience without merely exhausting the other and affect?

Overthrowing real-unreal

In order to find this genuine experience the girls deliberately deploy a strategy congruent with the logic of erratic excess. This prompts them to dissolve the boundary that excludes the virtual world; in other words, the girls are to dissolve any principle upholding a real-unreal distinction (or inside-outside, or subject-object, or fiction-fact). This dissolution becomes necessary collateral damage in their endeavor to affirm novel difference.

We are made aware of this push towards dissolution at multiple stages. The first time is when the girls rob a diner, in order to attain the money for their travel to the spring break event. In a surreal manner they bust into a local diner, threaten everyone in there with just a toy gun and a hammer, lash out violently to whomever resists and steal the cash – all the while we are outside, following the whole scene from the getaway car in slow motion. There is a certain distance held between all the violence and us. The real (us watching and the violence enacted), and the unreal (the slowed down action and the arms used) are separated. Though the distinction upholds, the girls are moving closer into its dissipation by making the unreal very real (the arms) and the real very unreal (the action).

Further along, this exact scene becomes the play for a re-enactment when Candy, Cotty and Brit want to show Faith, who did not participate in the robbery, what they did. There is no regret when they show Faith how they robbed the diner – as if it were just a level from a video game. Faith becomes the target of their violence while reenacting, as if their behavior is obliged to condemn her moral stance – Faith being the only one who has second doubts on such behavior. Any moral judgment seems to have no place in the girls' world, and thus Faith becomes the odd one out, ultimately being the cause of her departure. The reenactment, however, is not just an imitation: it is even more real than the actual robbery. This time around there is no distance, we are on top of the re-enactment and we feel Faith's oppression and fear. Faith is scared as she feels the threatening violence that the others emanate while ravishing in their own behavior. Here they are pushing against the limits of what is real even more so, bringing the unreal and the real far closer together, displaying the need to fully dissolve it.

In what the girls are looking for there cannot be a reality, or something outside, for it would only impose its boundaries on each occasion it entered their world. The outside hence gains a function as the law, imposing its boundaries and setting what is right and wrong. This becomes a disruptive factor in the world of the girls in this way. Faith, who keeps some moral standards as opposed to the rest, holds back the rest on several occasions due to such boundaries. Therefore, whenever the outside does act upon its power, it immediately disrupts the momentum of the flow the girls are in. This is even clearer when the police, who apprehend them, disrupt their partying. The final time the law intervenes, it is in a completely different form, as then the outside inside distinction has already been dissipated and the only boundaries left are purely physical. This is when Cotty is shot, and her body itself cannot go any further; then the boundaries are nothing more than the limits of the body.

In all cases it is the outside that returns, though in different forms. And it becomes clear from each

example that it is exactly this outside that the girls mean and need to dissolve. Now it becomes a matter of how to attain such an overthrow of reality.

Alongside the inside

Korine deliberately places the outside (or the real) so close to the inside (the fictional) to give way to the force that is harbored by the inside.[16] The outside comes in the reach of the inside, entangles with it while it suffers the violent bursts of the inside. It is the madness the inside spills that slowly gnaws away the outside; its composure is being brought down till it can no longer maintain itself in the face of such force.

The girls, being both teen stars and characters at the same time, make a double movement: both go from being innocent teens to mad adolescents. Letting these girls star in this film, where alcohol, drugs, sex, and violence are but normal, delivered quite the shock; their serene identities are operationalized for exactly that effect. The girls go through a sort of 'rite of passage' that is not unfamiliar for teen stars. It has happened with plenty of teen stars, the rebellion against their own pristine image. (Think of celebrity stars like Britney Spears, Christina Aguilera, or more recently Miley Cyrus.) Korine uses this process and makes it integral to the film, in other words, alongside the inside.

Korine does not shun back placing himself in the same proximity as well. Franco sharply remarks it when sayings he 'can't even take credit for Alien. He is Harmony's. As he says, Alien is a gangster mystic. A clown, a killer, a lover: the spirit of the age.' Korine has invested himself into Alien; it is Korine's own madness that connects through the film with the 'spirit of the age', with the erratic logic of the chopped, screwed and twisted ways of this digital era; Korine 'connects to deep layers of an a-subjective collective unconscious that penetrates the images, the characters, and the narrative.'[17]

Also us as viewers are drawn into this process; our composure is broken down in being the perverse spectators who watch such teenage girls undergo a radical shift from serene to mad adolescents. We are put alongside the inside just as much, and it is without a doubt our own madness, our own desire that the fiction absorbs as its own power. To put it differently, we are always alongside the inside, as 'the spectator is fused with the film; there is no spectator who watches (and listens to) a film, for the spectator is only ever formed by watching (and listening to) a film'.[18] But it is ultimately in dissolution of the real-unreal distinction that we as spectator will not just be a subject formed by it, but will also be part of the forming itself.

What then forms in this constellation of facets is a tightly woven fabric wherein the separate lines running through it – the girls as fictional center; the actresses, Korine and spectator alongside this center – are a conditional formation of what Deleuze calls the crystal-image.[19] All facets are facing one another, opening up reciprocal relations between them. Yet the formation itself still upholds space between its facets. As long as the center is restrained, the reflections between the facets can still be differentiated and the real-unreal distinction maintains.

An aesthetic life of excess

At the spring break event the partying, the drugs and the alcohol all become means to the girls' end of gaining a genuine experience. The girls are indulging in an endless frenzy that connects everything. Korine deliberately frames the partial-objects. During the partying, there are just these: a breast, a bottle, a mouth, an ass – etcetera: a mixture of partial-objects that rips the images away from their contexts. These shots are intersected with a diversity of images that do not adhere to any continuity but are rather fully erratic. The images become diverse in that they take on many different aesthetic modes, be it digital, analogue, hand camera, phone

camera, etcetera. All these images interchange one another and construct an imagery whole that is far from any realist mode of aesthetics. In such, the images are the direct embodiment of the screen culture the girls reside in. Gritty, grainy, neon saturated, even pixelated, all sorts of images with all sorts of qualities are being connected to in a frenzy.

What Korine sets up is a mixture between a fetish that frames partial-objects – though never singular objects as a normal fetish would have it (like Sacher-Masoch's whip) – and the variety of screens upon which they are skimmed.[20] The perversion is one for the screen itself. In this perversion, the girls give actual status to any screen and the images it emanates, and thereby they dilute reality – as reality relegates the screens and its images to a secondary principle of some unreal experience. This perverted way allows the girls to connect to the screen images in an uninterrupted manner, giving way to the stream of images of torn away fragments, partial-objects. As a fetish, the tearing away of the fragments flattens the images into bare surfaces. Then, in the stream, surface upon surface slides upon one another, and an imbricated whole that shifts, expands and contracts emerges. The normal space-time fabric is literally assaulted, as it is accelerated and ultimately exhausted. The exhaustion occurs because in the non-differentiating stream of images the whole of possible connections is reached.

An ever-thickening line draws itself as the process persists, one that threatens to swallow all facets that reside outside of it as the boundaries that restrain it are weakened. This process goes beyond any normal sense of mechanical repetition, as each connection made to each screen creates a completely new feedback loop. Not just the motions of partial violence are accelerated, but in connecting to the plurality of screens and their distinct qualities, difference is inserted into repetition; affect is then foregrounded in the process.[21]

A strong neo-like color saturation that give certain images a radiating effect turns up the affective modality even more. Where at first this excessive saturation is limited to certain digital images, progressively it spreads, seeping into all the images. Such color saturation, as Deleuze remarks, works directly on our nervous system, our brain. He notes that the 'brain, in contrast, is adequate to the modern world, including its possibilities of the expansion of electronic or chemical brains: an encounter occurs between the brain and color, not that it is enough to paint the world, but because *the treatment of color is an important element in the awareness of the 'new world'* (the color-corrector, the electronic image…).'[22] The excessive color saturation adds intensity beyond general experience, to the directness of such an affective encounter. Pure saturation is nothing but an encounter between the brain and color wherein the affective dimension takes prominence.

All the while a techno contrived beat plays. Through this techno-beat by EDM artist Skrillex, a continuous hovering, breaking and gashing, almost violent sound fills any space that is left. The space is literally pushed to its limit.[23] The resounding of this EDM track alongside the multitude of images 'intensifies repetition to the limit of aural [and visual] perception; the climax or musical "money shot" comes when this limit is reached or crossed'.[24] Normally such a 'money-shot' is precisely the type of movement that subjugates affect: it supplies a climate by building up towards it; more linear progression could hardly be possible. But the flip-side of this exact filling up of the space is that it integrally becomes part of exhausting it: similar to the repetitive imbrication of the flat images, and the saturation oozing through the images, the grim dubstep track adds to the overwhelming and exhaustion effect.

The entire intensive field is then made of nothing less than a fabric that comprises of all intensity that

Fig. 2: Spring Breakers (2012) Poster. Copyright by production studio and/or distributor. Intended for editorial use only.

can be mustered; the girls have pushed their milieu and themselves to the limit. There is perpetually this limit filling the complete distribution of what is possible in the milieu at that moment; this is the 'exhaustivity' that Deleuze recognizes in Beckett's work, where 'one remains active, but for nothing' due to being exhausted.[25] Precisely by consuming the entire space available, by indulging in it with no restrains, do the girls engage with nothing and everything at the same time. This is to find the continuity in discontinuity – which is that which is freed from the discontinuity that holds among the parts. The violent process lets all parts collide incessantly, to ultimately conjoin, which allows for a whole that is more than the sum of its parts to emerge: 'the whole produced […] is rather a "peripheral" totality that is added alongside its parts as a new singularity fabricated separately.'[26]

But activity for nothing continuously threatens itself. That is, there is the constant possibility for it to become its own limit, to fall back onto itself and to become its own goal, which would dissipate precisely that which is longed for by solidifying it. And since the process must be maintained for a longer duration – exhaustion of the whole is about an event but also about a tendency towards that event – the threat is imminent to its consistency. The perversion for the screen requires a 'virtual center or zero point' to play within the different system in order to maintain in the necessary duration.[27] The girls must therefore turn towards that which sets these boundaries continuously, and find a virtual center from where they can fully dissipate the distinction.

Virtual contract

What ultimately works as virtual center or opening to the virtual – the complete dissolution of the reality – is the contract that the girls strike up with Alien.[28] After the law has intervened in their incessant party streak and they are jailed for whatever reason, Alien, out of nowhere, bails them out. Given, they had a brief encounter with Alien before somewhere at a beach party, but Alien's actual entrance comes quite out of the blue. Alien is the chance encounter; the unexpected, risky but welcome surprise. And as much as the girls are happy to get out of jail, they are not quite certain how to act towards Alien. Should they be grateful? Is he to be trusted? Who is he even?

One of the most intoxicating scenes initiates. As the girls are intrigued by Alien and his appearance, a ritual commences wherein the four move around, play around, almost dance around Alien to assess and ascertain how to relate to him. The pace slows down into long and entranced swirling movements around Alien. Moving around him, the neon colors of saturation have made way for a more mute and tightening color pallet and the sounds have become a lingering hum. The image tightens, putting Alien momentarily at its center; he continuously talks like a shaman preaching his spells to sway the girls, echoing repeatedly like in a trance; as a magnet with its surrounding field, with the center clear and strong and its field in around it. Alien becomes a torque of time, the point around which the precedent intensity can revolve. The girls accept Alien, shift into his world and become a part of it; at the same time Alien's world shifts into theirs and becomes a part of it. Both worlds have become mutually inclusive. The contract is made, based on a mutual agreement.[29]

The similarity of the girls' bonding to Alien and the contract the masochist strikes up in the novels of von Sacher-Masoch is immediate. The masochist does so, according to Deleuze, in order to disavow reality – 'a simultaneous denial and acceptance of the real, an imaginary "suspension" of the disorderly violence of secondary nature that neutralizes the real and allows the unfolding of a new, ideal world of primary nature.'[30] In a way, the girls do a similar thing, as they are set on disavowing the reality in favor of the virtual world of screens. Yet they do not displace the law from father to mother, like

the masochist, rather they displace it from outside (reality) to inside (virtual world). But more striking even is a resemblance in how and why the masochist achieves such a contract. There is a ritual tendency in the action of the masochist, Deleuze remarks, all in order to give prominence to fantasy: 'The masochist is obsessed; ritualistic activity is essential to him, since it epitomizes the world of fantasy.'[31]

Precisely these two facets – the disavowal and the ritual – we see in the girls' tending towards Alien. First there is the disavowing of the outside by their perversion for the screen; they displace reality onto the images of the screen, and Alien functions as a virtual center for that. Then the girls engage in an entrancing ritualistic activity with Alien to, precisely like the masochist, epitomize the virtual world. Though the world of fantasy and the virtual world might not be exactly the same, they share their nature of being 'unreal'. In sum, the girls make the same double movement in at once disavowing the outside and affirming the virtual world.

Through the ritual activity, what the girls perpetually express is a sort of animal-like behavior. The masochist characters that Von Sacher-Masoch described had a direct tie with the animal, which was never one of imitating the animal, rather 'they enter zones of indetermination or proximity in which woman and animal, animal and man, have become indiscernible.'[32] From the start the girls have moved like a pack, the four of them always near each other, hanging around each other, protecting and caring for one another. Like a pack of wolves, they have been closing in to animal behavior and have operationalized their impulses trying not in order to satisfy a hunger but to find a longed for genuine experience. The girls' pack behavior is very much like the assimilation of individual identities into a digital community, where groups form and move together as a whole. We could say that the digital thus moves in very close to the animal – two poles that normally seem so far away from each other are here folded onto each other.[33]

Tarrying and exhaustivity

The contract radically alters something, or it opens up something radical. What the girls have been looking for – genuine experience – can be found through it, with it. The ritualistic pace in its turn transforms into a cool, slowed rhythm, forming a thick fabric that takes up all lines that were formerly still separate – the mad erratic connect-to-every-thing that maintained during the partying, finds its limit and pours over it.[34] The outside no longer maintains, the force of the virtual has engaged with it, entangles with it for a brief moment, to become indistinguishable with it. This is in its fullest the afore mentioned crystal-image. All facets – the outside-outside (our reality), the inside-outside (the girls their reality) and the outside-inside (Korine's reality doubled by the actresses reality) – collapse into one whole that zigzags from one state to the next, connecting disparate strata of time on the fragmented and multifaceted surface of the crystalline structure. This is at once the aesthetics of the delirium and its concomitant movement. The outside is suspended, just as the masochist suspends reality by continuously awaiting the blow.[35] It is suspended in that it could and can no longer hold; it was thickened in the fabric of space-time till the point of becoming crystalline. This is the new fabric, that of time-space. Time takes prominence and subjugates movement rather than being subjugated by it. All the acceleration that has been going up to this point was then a means to loosen all set formations, let them erratically collide and ultimately conjoin. Space is then fully exhausted, and what remains is pure time, duration.

What surfaces then, and becomes the whole surface, is a flowing fabric, cooled and suprasensual.[36] 'It is liquid. Scenes flow in and out of each other. A scene will start and then the imagery will jump to another, sometimes from the past,

other times from the future…'[37] The acceleration exhausted the whole, folding in all temporal strata onto one plane, setting the condition for novel difference that is attained through the suprasensual. Here the delirium congruent with a logic of erratic excess emerges, traversing all facets of the crystal at once, creating movement that, like a vortex, tends in several directions at once. And in bursts the image itself is slowed, lingering in a state of suspension.

'In schizophrenic psychosis the reality principle no longer holds and is replaced by the internal reality of the brain (the reality of illusions, the reality of the 'invisible').'[38] More psychotic than the Britney Spears exploitation, hashed up with the girls in pink balaclavas seems hardly possible. When Alien is sitting outside his 'mansion' on a beautiful patio near the swimming pool playing the piano, the girls join him carrying shotguns and ask him for a song. He responds by playing the song 'Everytime' by Britney Spears. The suddenness and the way the song consumes the entire space is reminisced of the famous dance scene in Jean-Luc Godard's *Vivre sa vie*: a pure expression of dance and music.[39] But in *Spring Breakers* it is even far more than just this expression. It is a pure expression 'from the mirror to the seed [, the opening].'[40] Whereas Anna Karina's dance scene would maintain a continuity and thus fit into a certain circuit of the narrative, in *Spring Breakers* the song is the mirror to the many potential actions that follow, with Alien acting as its catalyst. It no longer matters if these actions are real or unreal; they are affective truths in regard to the whole. The serenity of Spears' pop-song – its angel-like form – interweaves with a pure violence exacted in the own college student milieu. The girls, along with Alien, immerse in the delirium, during which they trash weddings, take hostage other spring breakers and ravish in all of the violence… and all the while the song is foregrounded. The violence becomes a pure expression of the milieu, not something hidden deep below the milieu, but sensuous and real in that it is necessary for its modulation. The violence is inherent to the modulation, but always in a double movement to the self and the other.

All meaning gets thrown into the vortex, pop culture, serenity and adolescence mix with the darker, crueler and always on the brink of death-like expressions. The mixture brings worlds together, bringing forth new relations. And what is central to this state of delirium – that is, virtual center – is that it abruptly cuts certain movements (a robbing) to start another, different movement (a dance), a reprise but different. This is continuity and discontinuity at the same time. All movements are without a goal; they are the goal itself, ravishing in themselves. The impulses have become short bursts deriving from a virtual center, not from a subject's ego. This is radically different from the impulses that were still deriving from and reconstituting a center or ego.[41] The impulses are now subjugated to the delirium, and are therefore underlying the contract: 'the specific impulse *underlying* the contract is toward the creation of a law, even if in the end the law should take over and impose its authority upon the contract itself.'[42] The mechanic repetition still remains, in that there is a cut, rinse-and-repeat structure to the underlying impulses. But this repetition favors the novel differences, moving in the nothing.[43]

Modulation

The delirium can be seen to function on two levels: a smaller and a larger circuit of the crystal. On the first, the smaller circuit, the exhaustion and the emerging delirium stage an encounter with the self. That is, in exhausting the entire plane through their perversion and acceleration, the girls are faced at once with the emergence of novelty and the destruction of the old: 'I is another', the Rimbaudian adage goes, being the self and another at the same time.[44] This confrontation is paired with the necessary violence, as the old must find its demise the same time the novel emerges. In the process of exhausting the

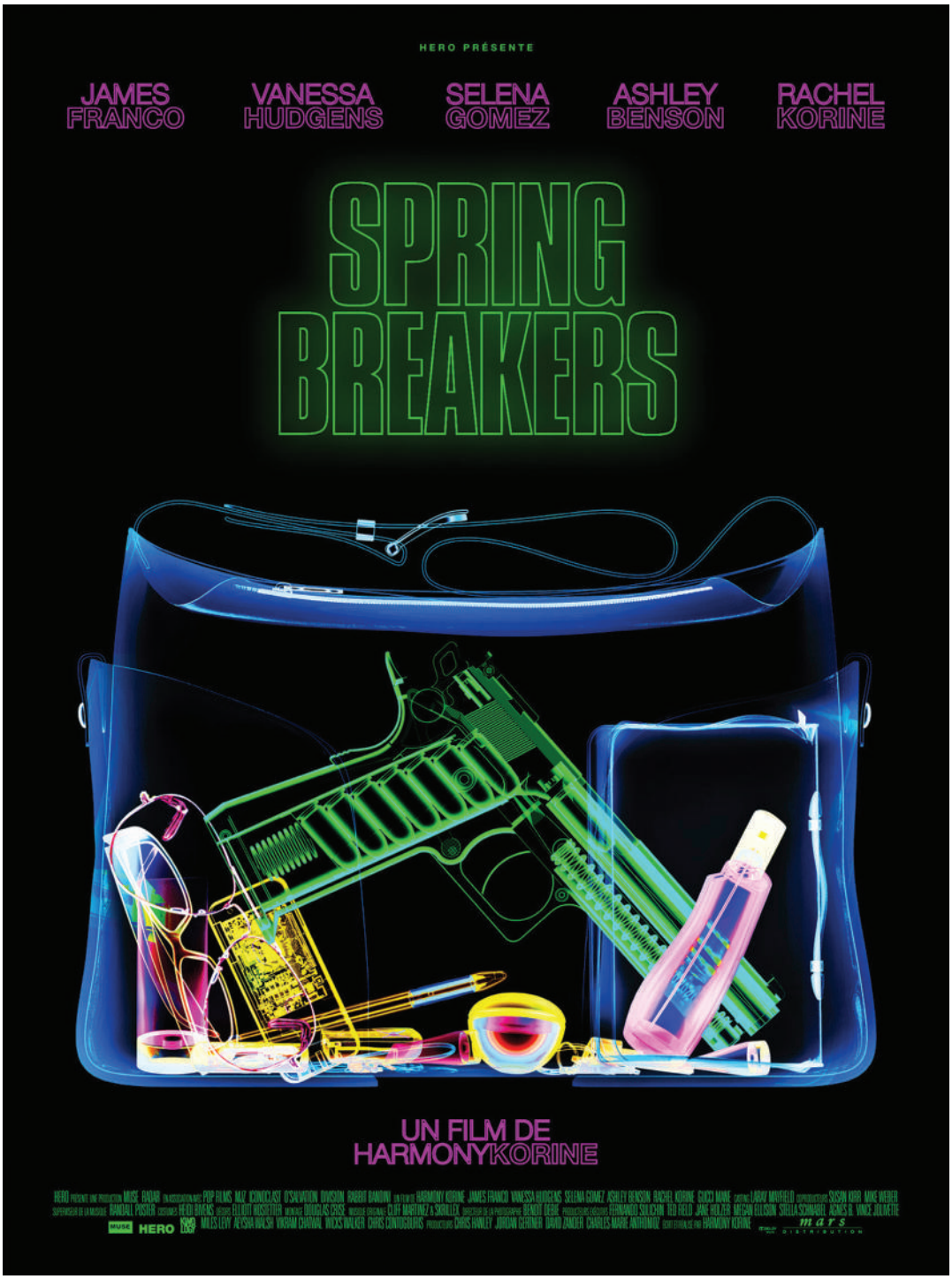


Fig. 3: Spring Breakers (2012) Poster. Copyright by production studio and/or distributor. Intended for editorial use only.

whole the self becomes that which one sees but can no longer recognize. It is self-affection: affirming the more than experience of affect and appropriating it for the subject both at the same time; a double movement of the creation of a new and the destruction of an old subjectivity.[45] Hence the excess of violence both outward and inwards; that is, the girls, in this state of trance exact as much violence on their milieux as on themselves. What was first still just exhaustion of the entire plane becomes actual violence as easily.[46]

On the larger circuit of the crystal, then, the modulation is one of affirming not appropriating the other milieu. The two milieux, the college girls' milieu and the gangster milieu, are no longer self-contained and have no longer a difference between them. It is then not that the impulses move from one milieu to the other to degrade it, nor is it that the girls simply imitate the behavior from that milieu. Instead, there are two series and 'one series explodes into the other, forms a circuit with it: an increase in power or a circuit of intensities.'[47] The two circuits have become relative distributions of each other. And that is exactly the logic under which these digital nomads work: Instead of making the impulses pass from one milieu to another while exhausting one and then the other, the two milieux supplement each other, they explode into each other and form new relations that did not exist when the two were separate. There is a becoming when moving from one singularity to the other and in the passing a new relation is made, one that allows for new meaning to emerge.

Destruction and/or closure

The delirium literally turns on itself. That is, the thickening of the fabric and its concomitant coldness dissipate the moment Cotty is shot. The outside reforms as a reverse spiral forms which finds it center in a concrete goal: revenge on Alien's rival whom shot Cotty. The techno-ritornello makes way for a crescendo, and as it progresses the image gets hazier, fading away into the directed violence. A new line emerges that directs itself towards an ending, towards the ultimate, literal destruction of the gangster-rapper milieu.

Spring Breakers ends as if nothing ever happened. Or rather, it ends in a perfect Hollywood 'everyone lives happily every after' – at least, it does for the two remaining girls. The milieu they encountered is left behind destroyed; Alien dies in the assault on the rival's mansion (and the girls give it little attention), and the entire gang of the rival is annihilated. The utter destruction of the delirium: it is the destructive side of life. The whole that is the film closes down in the newly arisen movement towards an end, ultimately producing a seemingly status quo. This is no longer the openness of the delirium in which novel difference could emerge, rather it is the closure by moving towards an end; the former is more than the sum of its parts, whereas the latter is exactly the sum of its parts. What are we to make of such a closed ending? The delirium itself brought openness to the whole by consuming all surrounding dimensions, letting novelty emerge alongside it. The movement towards the end *seems* then to be a reversal, in that everything is set back into its original setting.

We are outside once again, reflecting upon the whole and come to the bitter conclusion that it all added up to nothing. Worse even: it seems to have been nothing more than a violent outlash of spoiled teenagers living a feverish dream. Just an unreal fantasy. Just a mad story.

But it is exactly here that *Spring Breakers* does something, does create something real. What emerged as a novelty and which created new relations cannot be undone; what emerged might get appropriated, but it cannot be nothing; something has been added. And, the girls their tendency in overturning the real-unreal distinction unfolds in two directions, one fold inside and one fold outside. That is the point: everything was real, even or precisely

due to its madness, due to its specific delirious formation. Why is it real? Because it does allow for the subject to modulate, to radically alter itself by virtue of affirming affect. At the same time, it shows how fluid and thus ephemeral such change can be: it can be attained in its incessant quest, but can also be discarded just as easily. Underlying identity politics is a delirious, paradoxical substratum that makes it both possible and yet impossible. Or as Jasbir Puar beautifully phrased it, 'Why the destabilization of the subject of identity and a turn to affect matters is because affect – as a bodily matter – makes identity politics both possible and yet impossible.'[48]

Aesthetics itself seem to give little relief, ultimately. As viewer being part of the process means that we too are exhausted. Shaviro might perhaps be completely right when he says, 'Intensifying the horrors of contemporary capitalism does not lead them to explode; but it does offer us a kind of satisfaction and relief, by telling us that we have finally hit bottom, finally realized the worst.'[49] But at the same time I would add that any insight in how this process functions or can function adds to a better dealing with it. The dangers it lays bare heed caution; it gives a supplementary but real status to the virtual world; and it ultimately dispels the illusion of exploding capitalism, but shows that it can and must alter from within.

Notes

1. Gilles Deleuze, 'Re-presentation of Sacher-Masoch' in *Essays Critical and Clinical*, trans. by Daniel W. Smith and Michael A. Greco (Minneapolis: University of Minnesota Press, 1997), pp. 53-5 (p. 55).
2. *Spring Breakers*, directed by Harmony Korine (Muse Productions, 2013).
3. Brian Massumi, 'Navigating Movements' in *Hope: New Philosophies for Change*, ed. by Mary Zournazi (New York: Routledge, 2002), pp. 210-62 (p. 224).
4. Massumi, 'Navigating Movements', p. 225.
5. Simon Reynolds, 'Xenomania: Nothing is Foreign in an Internet Age' in *MTViggy.com* (2011) <http://www.mtviggy.com/articles/xenomania-nothing-is-foreign-in-an-internet-age/> [accessed 12 September 2014].
6. James Franco, 'Spring Break: A Fever Dream' in *VICE* (2013) <http://www.vice.com/read/spring- break-a-fever-dream> [accessed 14 December 2013]
7. Gilles Deleuze, *Cinema I: The Movement-Image,* trans. by Hugh Tomlinson and Barbara Habberjam (London: Continuum, 2005) and Gilles Deleuze, *Cinema 2: The Time-Image*, trans by Hugh Tomlinson and Barbara Habberjam (London: Continuum, 2005)
8. Bell Hooks, 'Eating the Other: Desure and Resistance' in *Black Looks: Race and Representation* (Boston: South End Press, 1992), pp. 21-39.
9. Steven Shaviro, 'Accelerationist Aesthetics' in *E-Flux* 46.06 (2013) <http://www.e-flux.com/journal/accelerationist-aesthetics-necessary-inefficiency-in-times-of-real-subsumption/> [accessed 14 September 2014].
10. Robin James, 'Loving the Alien' in *The New Inquiry* (Oct. 22, 2012) <http://thenewinquiry.com/essays/loving-the-alien/> [accessed 02 Januari 2015]
11. Sharon Winnubst, 'The Queer Thing about Neoliberal Pleasure' in *Foucault Studies,* 14 (2012), pp. 79–7.
12. Karl Marx, *Capital. Vol. I*, trans. by Ben Fowkes (London: Penguin Books, 1990), p. 342.
13. Antonio Negri and Michael Hardt, *Empire* (Cambridge: Harvard University Press, 2000).
14. Shaviro, 'Accelerationist Aesthetics'.
15. Deleuze, *Cinema 1*, p. 133.
16. For this beautiful conception I am indebted to Pieter van Bogaert, see Pieter van Bogaert, 'Ongemakkelijk langs de binnenkant. Over Renzo Martens' Episode III – Enjoy Poverty' in *Kunstkritiek* (2010).
17. Patricia Pisters, *The Neuro-Image. A Deleuzian Film-Philosophy of Digital Screen Culture* (Stanford: Stanford University Press, 2012), p. 57. Pisters elaborates further that for Von Trier this process might be therapeutic, which can be argued for Korine as well. Though one can wonder whether Korine has any intention to emerge from the continuous delirium rather than indulge in it continuously; there seems to

be little 'therapeutic' in the sense of curing the process for Korine, rather it is a remaining output, which embraces the exhaustion itself.

18. Richard Rushton, 'Deleuzian Spectatorship' in *Screen* 50, 1 (2009), pp. 45-53 (p. 48).
19. Deleuze, *Cinema 2*, pp. 66-7.
20. Leopold von Sacher-Masoch, *Venus in Furs*, trans. by Jean McNeil (New York: Zone Books, 1991).
21. Patricia Pisters describes the consequence of such a multitude of screens as follows, 'This oversaturation of spectacularized images and perspectives creates on the one hand an effect of disconnection or distance from reality as 'pure spectacle'. On the other hand […] actual reality keeps on returning, as mediated by affective screens, to mobilize us politically and ethically in many different ways.' (Pisters, p. 273.) Although here she talks mainly about the spectacle of war cinema, its aesthetics share the same qualities.
22. Deleuze, *Cinema 2*, p. 317.
23. Reynolds, 'Xenomania: Nothing is Foreign in an Internet Age'.
24. James, 'Loving the Alien'.
25. Gilles Deleuze, 'The Exhausted' in *Essays Critical and Clinical,* trans. by Daniel W. Smith and Michael A. Greco (Minneapolis: University of Minnesota Press, 1997) pp. 152-74, (p. 153).
26. Daniel W. Smith, '"A Life of Pure Immanence": Deleuze's 'Critique et Clinique' Project' in *Essays Critical and Clinical,* trans. by Daniel W. Smith and Michael A. Greco (Minneapolis: University of Minnesota Press, 1997), pp. xi-lii (xiii). Cf. Erin Manning, *Aways More Than One * Individuation's Dance* (Durham and London: Duke University Press, 2013) p. 2.
27. Gilles Deleuze, *The Logic of Sense*, ed. by Constatin Boundas, trans. by Mark Lester and Charles Stivale (London: Continuum, 2004), p. 343.
28. Gilles Deleuze, *Coldness and Cruelty* (New York: Zero Books, 1991), p. 91-102.
29. Robin James could not have been more right to title his article 'Loving the Alien' which seems in opposition to Reynolds conception of 'appetite for the alien' and similar notions. James seems to have accepted that this process is not per se about consuming the other. Instead, the 'love' for the alien – or for Alien, here! – is far more based on a mutual relation, or at the very least one where not the other is exhausted, but both the subject and the object are exhausted, as I am arguing for.
30. Ronald Bogue, 'Re-Viewing Deleuze's Sacher-Masoch' in *Deleuze's Way: Essays in Transverse Ethics and Aesthetics* (Hampsire: Ashgate, 2007), p. 110.
31. Deleuze, *Coldness and Cruelty*, p. 94.
32. Deleuze, 'Re-presentation of Sacher-Masoch', p 54.
33. It is interesting to note here how the animal-like behavior seems to have two sides here. On the one hand, as Deleuze elaborates it in relation to the masochist, but also in other works such *A Thousand Plateaus*, the animal becomes a virtual center for becoming-other, or simply Deleuze's process of becoming. On the other hand, however, the animal-like behavior has a more negative connotation when it is considered within the concept of the impulse-image (*Cinema 1*, pp. 127-44). Here the behavior is part of a unidirectional exhaustion, the exhaustion of the other, like the vampire, like eating the other. What is then remarkable, and what obviously is the question, is what distinguishes both types of behavior that fall under the same name? As I implicitly argue in this essay, I believe it is a matter imagination (in terms of the *Coldness and Cruelty*) or the virtual (in terms of *Cinema 1* and *Cinema 2*). The perversion and its virtual center is a necessary condition to subjugate movement to time; after it becomes a matter of a particular aesthetic process that further unhinges time.
34. It is important here to note that there is no linear progression of any kind at work. That is, the limit is not reached at the end of the process, but rather it is at 'a point that is already reached well before one knows that the series is exhausted, and well before one learns that there is no longer any possibility or any story, and that there has not been one for a long time.' (Deleuze, 'The Exhausted, p. 158)
35. Deleuze, *Coldness and Cruelty*, p. 31.
36. Ibid., p. 69.

37. Franco, *Vice*.
38. Pisters, p. 38.
39. *Vivre sa vie,* dir. by Jean-Luc Godard (Les Films de la Pléiade, 1962).
40. Deleuze, *Cinema 2*, p. 74.
41. Ibid., p. 131.
42. Deleuze, *Coldness and Cruelty*, p. 77. Emphasis added.
43. The mechanic resonates both the sadist's practice that Deleuze describes in *Coldness and Cruelty*, and the scientific probability of Beckett's characters described in 'The Exhausted'. Deleuze sees both manners as radical Spinozism. But here these forms of mechanical repetition are subjugated to a virtual force, perhaps partly due to the screen culture.
44. Gilles Deleuze, 'On Four Poetic Formulas That Might Summarize the Kantian Philosophy' in *Essays Critical and Clinical,* pp. 27-35 (p. 29).
45. 'The actual is always objective, but the virtual is subjective: it was initially affect, that which we experience in time; then time itself, pure virtuality which divides itself in two as affector and affected, 'the affection of self by self' as definition of time.' (Deleuze, *Cinema 2*, p. 80.)
46. With everything sucked one can wonder whether Marx's vampire can sustain itself. With the subject itself being continuously exhausted as well, it is the vampire itself that is being sucked; it is more a cannibal-like version of capitalism where the subjects turn on themselves in order to attain the needed life substances. Such a notion is version close to Eduardo Viveiros de Castro's conception of cannibal metaphysics, where it the self is consumed as well. (Eduardo Viveiros de Castro, *Cannibal Metaphysics* trans. by Peter Skaffish (Minnesota: Minnesota University Press, 2014).
47. Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, trans. by Brian Massumi (London: Continuum, 2004), p. 172.
48. Jasbir K. Puar, 'Prognosis time: Towards a geopolitics of affect, debility and capacity' in *Women's and Gender Studies*, 19:2 (2009), pp. 161-72 (p. 168).
49. Shaviro, 'Accelerationist Aesthetics'.

Biography

Halbe Kuipers is a media scholar working at the intersection of film, digital media and philosophy. He recently finished a research master at the University of Amsterdam in the field of media with the thesis 'Skimming Surfaces: Aesthetics and Symptoms of Impulsive Behaviour in the Films of Luis Buñuel and Harmony Korine', which traced particular symptoms in relation to aesthetics from a Deleuzian perspective. Currently he is pursuing a PhD that concerns itself with excess and exhaustion from an aesthetic and artistic angle.

The Architecture of Dreams: Towards a Transcendental Biopolitic of Addiction Care

Arthur Waisblat

> The sirens of ancient Greece sang dangerous music. Nesting on a pile of human bones, on a rocky island off the coast of Sicily, the bizarre creatures, half-birds, half woman, sang to the sun and the rain; their song had the power to calm or to stroke the winds and to inflame men's loins. Their music was irresistible, the words even more so than the melody. They promised knowledge to every man who came to them, ripe wisdom and a quickening of the spirit. Many a sailor was lured to their shore – where he'd pine away without food or drink, unable to break the sirens' spell. The sirens' music tempted sailors by offering an illusion of power, joy and wisdom. The music was sweet and seductive; the danger of losing one's connection with reality, even losing one's life, was apparent. But for the victims, the attraction was far more powerful than the concept of danger.
>
> (Thomas Bulfinch, *The Age of Fable*)[1]

The Odyssey of Odysseus

Among the many commodities offered by modern life, one may have consequences overcoming the benefits of its use. The issue of drug addiction has reached throughout the twentieth century epidemic levels, which economic burden to society is as great as the human suffering it engenders. Beyond mass incarceration in the United States and increasing violence in Latin America, the World Health Organization estimates that tobacco contributed to the death of more than 100 million smokers worldwide in the twentieth century, and may very probably kill one billion more in the twenty first century.[2] If alcohol needs about two years to equal what tobacco does in one, it holds responsibility for about 60 million disability-adjusted life worldwide.[3] But iatrogenic illnesses -illnesses as a result of biomedical treatment- was estimated to be the leading cause of death in the United States -before cardiovascular diseases and cancers- with more than 783,000 American citizen dying in 2006, which equals about 2,400 deaths a day.[4] In the words of Alain de Botton:

> Libertarians may concede that we would theoretically benefit from guidance, but they still complain that it would be impossible to deliver it, for the simple reason that at heart no one any longer knows what is good and bad.[5]

Societies have through history provided answers to such issue in very diverse and contradictory means. To avoid their illegal wishes while still listening their magnificent chants, the strategy of Odysseus is well known: he tied himself to his mast and plugged his sailors' hears with bees' wax. This is the common contemporary attitude. However the London School of Economics leading experts group gathering some of the highest scientific and political elites of our modern world has just officially broken silence: 'It is time to end the "war on drugs" and massively redirect resources towards effective evidence-based policies. […] The pursuit of a militarised and enforcement-led global strategy has failed on its own term.'[6] Building on such renewed perspective for the twenty first century, I wish to draw an investigation on the issue of mental health and

substance addiction within the context of neoliberal consumerist culture and outline a possible framework for political and clinical strategies to deal with the matter in architectural terms.

Drugs and addiction constitute a global issue, for which I believe neither origins can be traced nor future outcome be addressed throughout the lens of isolated contexts or discipline. Social, neuropsychological, theological, legal, economical or epistemological perspectives will constitute all diverse angles of views for approaching one local reality throughout the design of an addiction care centre in the city of Rotterdam. What ethical questions do our current models of law enforcement rises, how cultural relativity affects collective morality in time -historically- and space -ethnographically- ; and in definitive, how can the architecture of matter and its milieu supports medical care and re-shape the neurological architectures of the addicts most of us are. [figs. 1-3]

Biofeedback and Empowerment

A critical discussion on the means of exercise of power, punishment and public health can hardly avoid Michel Foucault discourse on biopower and biopolitics. As the production of truth regulates and commands the relations of power, to trace the history and possible future of medical truth is to reveal the epistemological basis on which science operates through which the socio-political exercise gets into being. Some have advocated to replace the -Just Say No!- claimed by Nancy Reagan to a -Just Say Know! To liberate ourselves away from ignorance towards a quest for meaning, from subjected to the law to concerned by the law, is to unplug our bee's wax, the ears back into the social discourse.

A noopolitic, acting on the -noos- for mind while -bio- acts on the body, could in the light of the latest neuroscientific discourse restore the exercise of freedom and creative resistance.[7] This enterprise wishes to translate in pragmatic terms such theoretical statement investigating the role of attentions and intentions, production of subjectivities and alternative temporalities within care technologies which tend to be undermined within the present mainstream psychiatric paradigm; introducing new forms of 'technologies of self', pharmacological and neuroarchitectural means to foster noo-political independence to liberate the ego from the sirens of bio-power, whatever be its various forms of seduction: oil, alcohol, heroin, cocaine, meta-amphetamine, cannabis, nicotine, Prozac or Ritalin. It aims to investigate the therapeutic value of lucid-dreaming, altered consciousness, self-hypnotic or meditative awareness in the metacognitive process of emotional self-regulation and its practical application in psychiatry and toxicology: the clinical biofeedback.

Maps and Territories: the non-Aristotelian tradition

Any investigator of clinical cartography should be aware of the dialectical relationship between reality itself and its various forms of representations, and not confuse the object of study with its abstractions. The non-Aristotelian tradition of systems of thought traced by Alfred Korzybski advised us to beware of such semantic trap and to keep in mind that, in every case, the cartography is not the territory.[8] If such concepts as mind and body, space and time, sane and insane can be isolated in the abstraction of language, one will have a hard time dissociating one from the other empirically in the everyday continuum. As clinical critics noted, 'attempting to find the cause of cancer or addiction in the cellular level is like trying to understand a traffic jam by examining the internal combustion engine.'[9] The present work argues that there can be no understanding of human suffering in the abstract only, and new answers to psychiatry, criminology or toxicology cannot be set forth as long the body is seen within its biopsychosocial unity and the epigenetic opportunities and experiences its milieu affords. It is then highly vitalist and dynamist, in the sense that

it wishes to conceive health as a ethic of life where disease is seen as a rupture of equilibrium with a larger whole rather than the result of hazardous or deterministic mechanisms unrelated to life itself.

A short history of pharmacology and social morality

What is a drug? To go beyond the hard/soft popular duality -which does not hold much scientific sanity- we can propose a more precise -yet simplified- triality:

1) *Stimulants* -Cocaine, Speed, Amphetamines, Nicotine, Caffeine- accelerate psychobiological functions;

2) *Depressants* -Opiates, Cannabis, Alcohol- slows them down;

3) *Psychedelics* -LSD, psilocybin mushrooms, Ecstasy, Mescaline, Ayahuasca, Ibogaïne…- do not act on the speed but on 'the quality and character of thoughts'. What occidental orthodoxy name 'hallucinogens', 'delirogens' or 'psychotogens', is what users or shamans prefer to call 'entactogen', 'empathogen' or 'entheogen', for a better connection to the self, to others, and spirits. The semantics of pathology are indeed, very relative.

Probably one of the latest most detailed comparative study on drug harms was undertaken by psychiatrist pr. David J.Nutt, previous chairman of the UK Government's advisory on the miss-use of drugs.[10] Combining physiological, psychological and sociological data, results are unequivocal: Alcohol is the big 'winner'. On a scale of 100, crack cocaine gets first place (37) on the personal psycho-physiological harm, followed by heroin (34), methamphetamine (32) and alcohol, while in terms of social harm alcohol scores first (46), before heroin (21) and crack cocaine (17). On the overall score, alcohol scores highest (72), followed by Heroin (55), Crack cocaine (54), Meta-Amphetamine (33), Cocaine (27), Tobacco (26), Cannabis (20), Ketamine (15), Ecstasy (9), LSD (7). Social harms are to be taken within the United Kingdom context, but a close look at statistical surveys in the Netherlands can easily confirms such findings: In 2009, 8,863 citizen suffered from an addictive relationship to cannabis, 9,993 from cocaine, 12,466 from opiates (heroin and methadone), 1,504 from amphetamines, 34,646 from alcohol and 154 from ecstasy (midway between a stimulant and a psychedelic), none from the use of any other psychedelic.[11] Tobacco kills about 19,000 Dutch citizen every year, alcohol a little less than 2,000, opiates 52, cocaine 30, ecstasy less than five, cannabis or any other psychedelic (for the most part tolerated) none.

As there is absolutely no direct link between harmfulness and legality, the implicit meaning of prohibition must have found its interests elsewhere. 'Legal status of a drug is determined by its standing in a culture and by what people believe about its users' points down historian Richard Lawrence Miller, factors which have very few to do with chemistry and neuropharmacology.[12] If morality defines the sets of values and rules imposed by a particular society, it worth analysing how such codes of conduct gets dictated by biopolitical authorities from the necessities of the game of power and truth.

The history of drug control cannot be understood unless taken within the broader context of modernity and neoliberal market economy. My enterprise is not as much to elaborate a critique of modernity itself than it is to dig out how the same processes that lead to important medical progress heralded consequential drawbacks on the moral and social attitude towards care for the suffering self.

Until the late nineteenth century, consuming opium was considered a fundamental civic right. Such a consistent symbol of occidental moral and financial well being that China's decision to make its production illegal lead the British Empire to declare

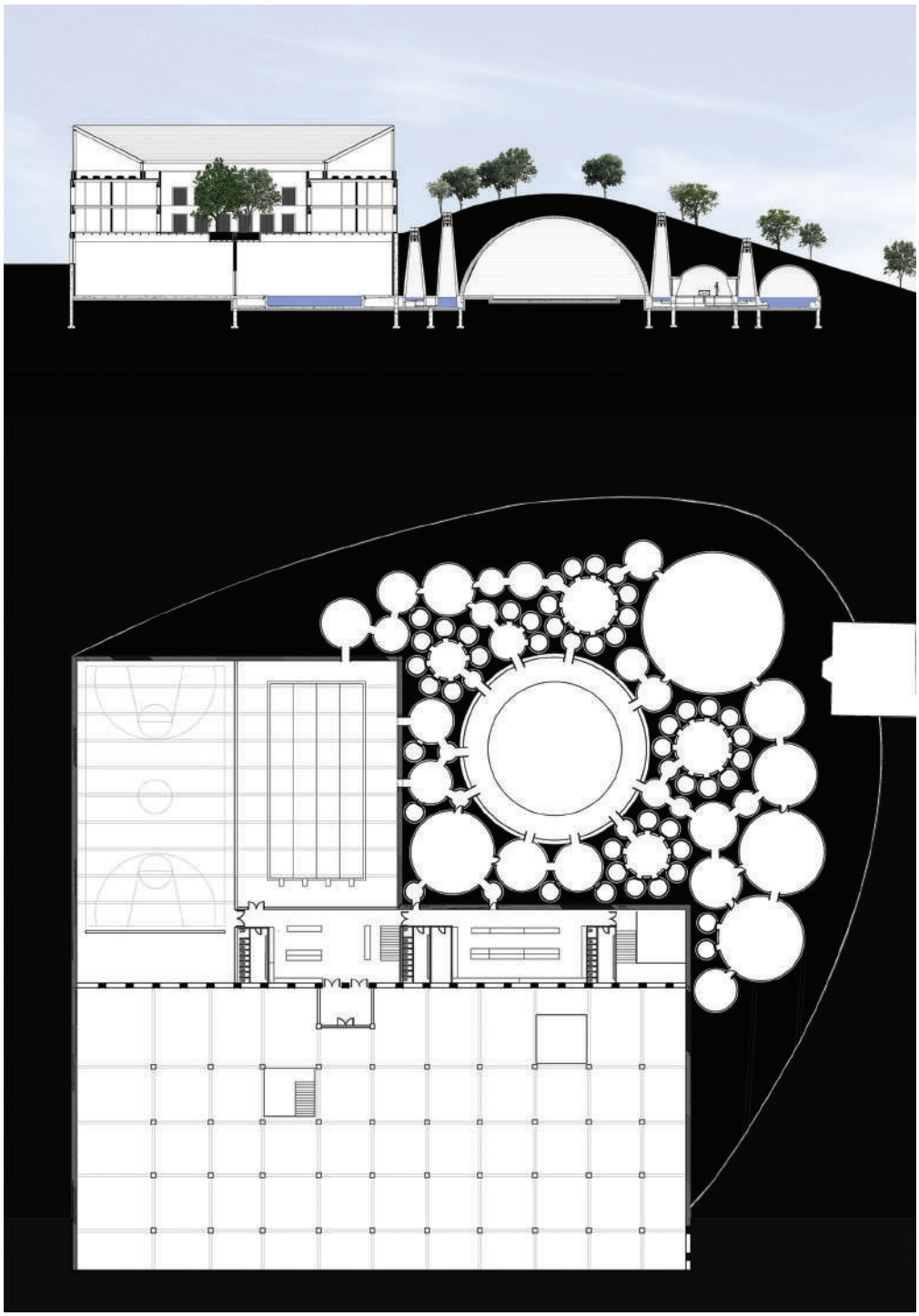


Fig. 1a: Plan and section of the Transcendental Spa: the random ‘looseness’ of trajectories reflects the aleatory character of visions one may have through Psychedelic sessions. Source: Author.

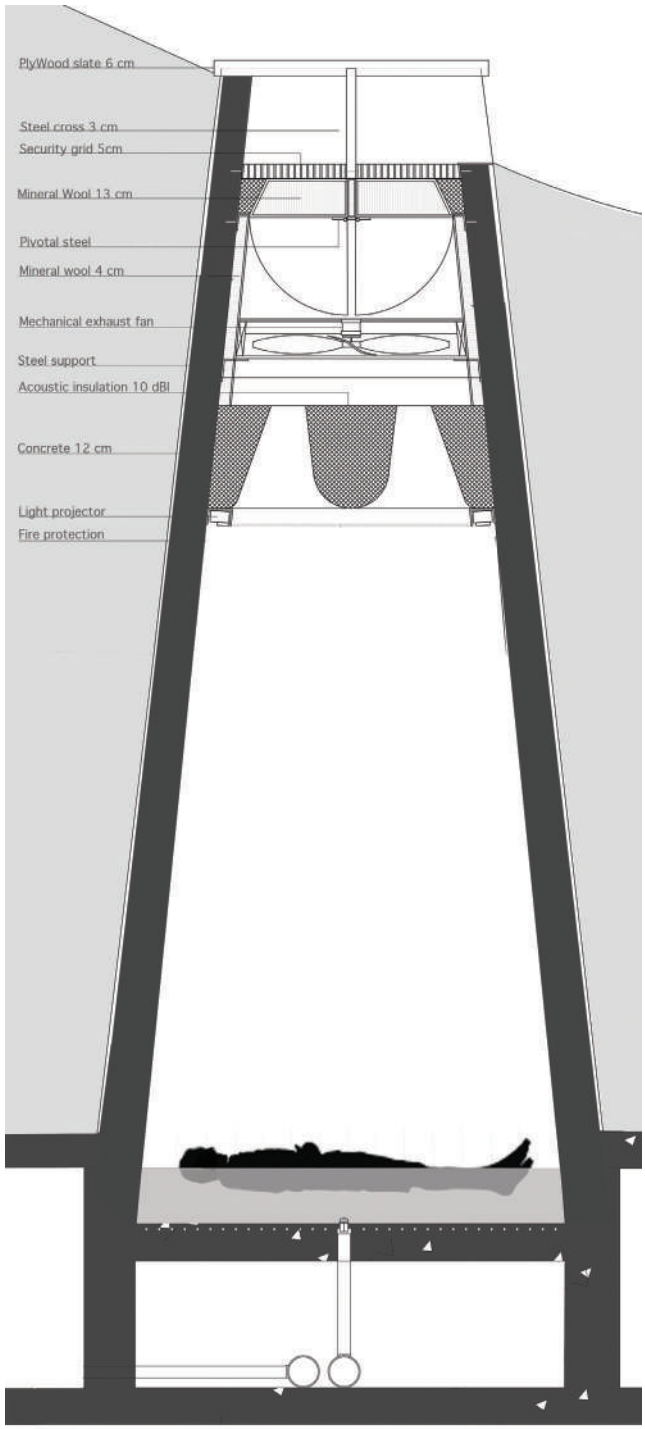


Fig. 1b: Sensory Deprivation Therapy: A new version of Lilly's original tanks with top-ventilation and increased vertical dimension to avoid claustrophobia and enhance spiritual enlightenment. Source: Author.

the first wars to the Qing Dynasty, holding on the business of opium at the price of 40,000 soldiers. Until the early twentieth century, most of the drugs considered illegal today were common, doctors prescribed cocaine, heroin and morphine to heal pains and provoke general feelings of wellbeing, users were numerous and those that abused from it were taken care of sympathetically by society. How did what mattered as a public health issue became a criminal issue?

The progressive separation of church and state can appear as a first element of explanation.[13] If the use of 'drugs' in a traditional or pre-modern society was ruled by custom or religion, a secular and liberal state emptied of moral authority could only rely on external rules, unable to differentiate from moderate to dangerous use. Legal constraints replaced social auto-discipline, and it is perhaps the greatest paradox of the modern secular strive for freedom to announce the end of the freedom of hedonist drug use. The development of more precise, efficient and safer medications to relieve pain and headaches ended the market of the old drugs, as the ideas of healing and pleasure progressively distanced themselves further apart from each other.

But the First World War played probably the greatest role in shifting individual's sovereignty from the church to the State ownership for the mechanical discipline of warfare strategies, and what was an assault on the outside to guarantee citizen's rights and freedom on the inside in the case of the opium wars became a drug assault on the inside to hold territorial grounds on the outside during the Great War. Racial and ethnic prejudices played also a proeminent influence on drug policy making particularly in the American and Australian campaigns, a case well studied by R.L. Miller, for whom the war on drugs had never been on anything at all that a war on race. While opium leisure smoking was largely limited to Chinese workers of the American west coast in the 1870s, cocaine use to Afro-Americans in the 1890s, cannabis smoking to Mexicans in the 1930s or LSD to hippies in the 1960s, to stigmatize objects appeared as the perfect invention to target subjects in the process of ostracism and mass incarceration. If alcohol was for a while strictly regulated in the United States, laws targeted production instead of consumption: manufacture and sale was the only illegal activity, as politicians wouldn't take the risk to imprison two thirds of its population, and its ancient rooting within European history and American habits finally preserved its immunity.

Governance & Sanity

Borrowing from Ivan Illich discussion on clinical and social iatrogenesis, political iatrogenesis can describe the process by which governmentalities induce the opposite results of the social problem they promised to solve.[14] Coined by Richard Nixon in the 1970s, the 'War on Drugs' has left many political analysts puzzled by its inefficiency. During the last 40 years, the United States spent 500 billion dollars to diminish availability and harmfulness of products. As only consequence, cocaine had become more affordable than ever, its price diminished by half from 1993 to 2003.[15] The example of Portugal, that decriminalized in 2001 possession of all drugs while substituting the cost of a stay in jail by a therapy offer, can serve as the best example of how to counter such iatrogenic perversion. Previous European leaders of opiate consumption and HIV infections, an evaluation study published in 2009 showed that while direct drug-related death increased by more than tenfold from 1989 to 1999, the same number decreased from 400 to 290 from 1989 to 2006 while drug related HIV infections decreased by 17 percent from 1999 to 2003.[16] Comparative surveys of 17 countries have shown that illegal drug consumption is at its highest peak where governmentalities are the most punitive. Cocaine and cannabis use is higher in the United States than anywhere else, where laws are the most draconian. A close analysis of the Dutch governmentality can show the best guideline to efficiently

reverse the political iatrogenic madness.[17] Shifting from repressive punishment to compassionate care in the mid-nineties, the project *Safe&Clean* further extended as *Without a Roof* offered proper conditions of living and drug consumption rooms to homeless Rotterdamers resulting in a dropout rate of up to 27 percent. The question remains how care and treatment be best administered.

Etiology and Milieu

If ecology has brought to psychology the study of behaviour-setting relationships in the second half of the twentieth century, only recently has biological science challenged the mechanist belief to see our brains and bodies as fixed genetically determined structure. Structural plasticity defines the potential character of nerve cells for growth and regeneration according to environmental stimuli, greatest during early development but consistent throughout all life of mammals. It is now of common neuroscientific knowledge that emotional attachment plays a pro-eminent role in nerve cell growth and regeneration indispensable for any organism to maintain an ideal state of homeostasis, the healthy balance and stability of the internal conditions of the body in response to the external condition of its milieu. Studies have shown that female rats separated from their mothers shows lower than normal gene expression that regulate maternal behaviour and decrease ability to maintain attention and stress regulation during adulthood.[18] Therefore the essential neurotransmitters necessary for self-regulation of the hypothalamic-pituitary-adrenocortical axis in humans responsible for maintenance of the homeostatic balance are not as much set a birth that they are environmentally determined. Early experiences shapes neuroendocrinal balance resulting in long term alteration of the HPA axis and dysregulation of cortisol secretion at the basis of a vast number of pathologies linked with chronic drug abuse and violent behaviours.[19] 'Almost all women now inhabiting "Canada's addiction capital"-as the Downtown Eastside of Vancouver has been called-suffered sexual assaults in childhood, as did many of the males,' recalls Dr Maté. 'Childhood memories of serial abandonment or severe physical and psychological abuse are common. My patients' histories are chronicles of pain upon pain.'[20]

At least two studies can show that the addictive power of the drug reside more in the relationship between the user and its milieu than in the substance itself. A psychiatric study showed that while 20 percent of American soldiers suffered from heroin addiction during the Vitenam War, their remission rate reached 95 percent after simple escape from distress of the war and returning to their American domestic environment.[21] Psychologist Bruce Alexander famous Rat's park experiments showed in 1981 that rats placed in different environments behaved differently while exposed to morphine: caged rats consumed up to twenty times more than those placed in natural and spacious environments, which did not feel much appetite for the drug.[22] The findings suggest both theories underlying current penal procedures, that of individual choice or absolute powers of the drug itself deserve to be re-examined in a subject-milieu perspective.

Noopolitics and Homeostatic Balance

How can the latest discovery of our psychophysiology induce a new political framework for therapy? Not only did a fixed conception of our biological nature been challenged by epigenetic plasticity, but a new paradigm in the physical understanding of our world may have consequences to set a new framework for psychology. The Behaviourist movement have profoundly influenced mainstream academic western psychology for about a century, on the basis that no such thing as consciousness or internal awareness be the rational object of scientific inquiry. Seeking to explain human behaviours as mechanical stimulus-response and classical conditioning of various kinds in a ideology placing the expectation of the controller above the inner nature and needs of the subject of control, Skinner dissociated silent

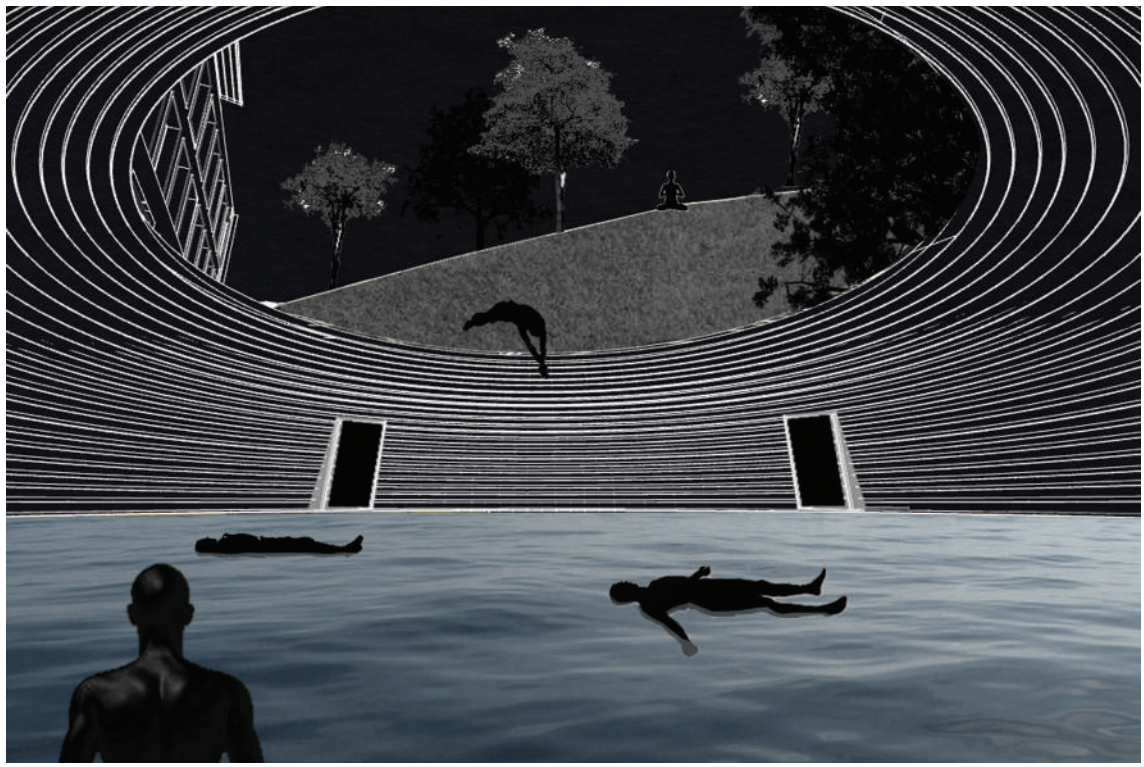


Fig. 2a: Outdoor float therapy. Source: Author

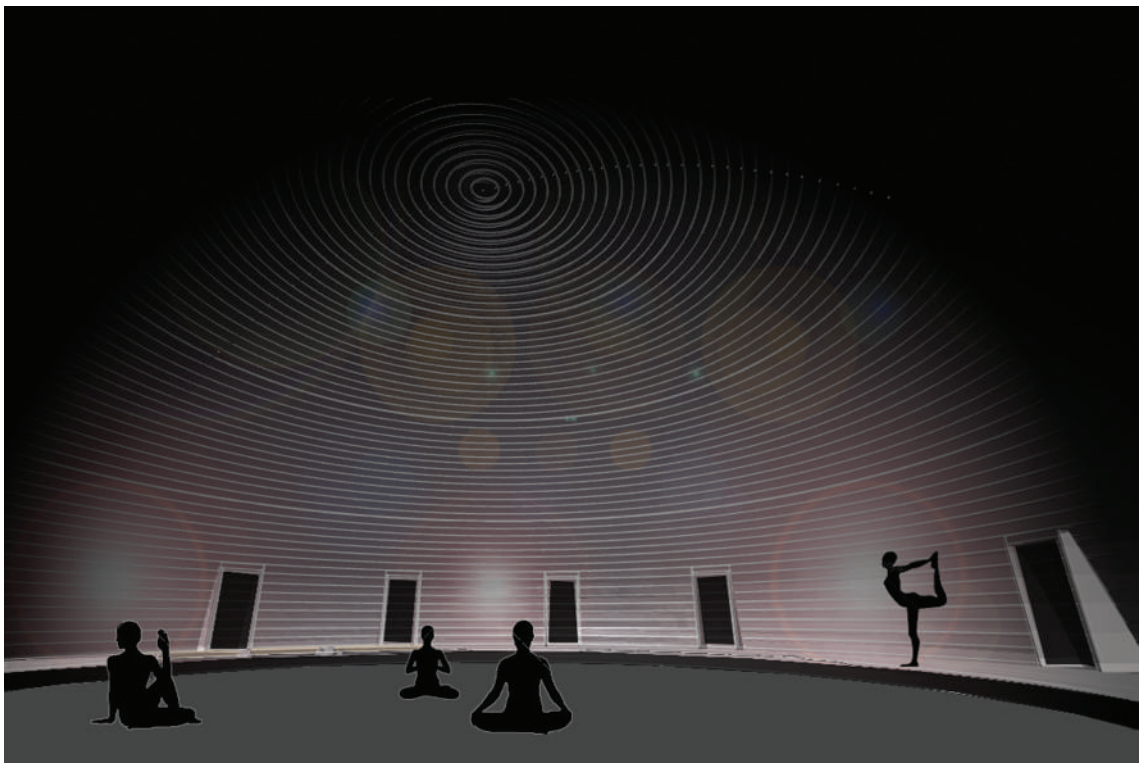


Fig. 2b: Indoor dome. Source: Author

masters from disincarnated slaves in the practise of therapeutic rehabilitation and maintenance of social order as Descartes dissociated the body of observation from the mind of the observer. If modernism can be seen as a rupture away from the subjective inconveniences of faiths and traditions that standardized objective means of industrial production had practically annihilated, and punitive prohibition the consequence of such revolution, we may now resolve by science issues raised in spite of science, rebuilding a therapeutic world where mind matters in the plastic redefinition of matter.

If the classical view of neuroscience posited the assumption that all brain mechanisms can suffice to explain psychological phenomena without reference to intentional subjective choices, contemporary quantum physical theory shows that the consciousness of human agents does have an influence on the structure of empirical data.[23] Psychiatrist J.Schwartz demonstrated that conscious efforts can produce changes on the structural features of ion channels critical to synaptic function.[24] Self-directed neuroplasticity is the term coined to describe how mental training alters cerebral function for a therapeutic goal from severe pathological to less pathological cases. Schwartz & Begley demonstrated how focused attention showed consequent changes in caudate nucleus metabolism and the functional relationships of the orbitofrontal cortex-striatum-thalamus circuitry in patients suffering from severe obsessive-compulsive disorder. Suggestion of lower serotoninergic impulse and higher cortisol levels have been linked with many cases of depression or violent behaviours: men with high levels of hostility show a three-fold larger rise in cortisol levels during daytime activities.[25] Regular practice of focused attention, or transcendental awareness have shown to produce changes on reducing cortisol secretion and improved serotoninergic production to restore neuro-endocrinal balance on a long-term perspective.

Technological improvements in the practice of clinical cartography have today given us tools to study the role of cortisol in the maintenance of homeostatic function much better than it could be a few dozen years ago. The science of psychoneuroimmunology shows us for instance that lung cancer occurring from tobacco smoke may be caused more by anxiety and stress due to chronic high level of cortisol than mechanically inscribed in the innate quality of our DNA code, which can explain why most smokers do not develop lung cancer.[26] Stress damage the process of DNA repair; the regulation of healthy tissues through natural death of cells biologists calls *Apoptosis*; which dis-regulation had shown to be the cause of a frightening number of pathologies, from 'tumour protection, autoimmune and immunodeficiency diseases and neurodegenerative disorders.'[27]

A pioneering study in psychoneuroimmunology realized at the Medical University of Nijmegen in 2011 in the Netherlands may have profound consequences in the noopolitical battle for scientific truth. A team of 12 researchers in intensive care, neurology, cardiology, physiology and immunology studied the case of Wim Hof, the famous Dutch Iceman known to resist extreme temperatures naked thanks to a Zen-meditation technique. If the voluntary activation of the autonomic nervous system and innate immune systems was hitherto considered impossible, empirical evidence shows that the mechanical ideology is crumbling at its root:

> Healthy volunteers practicing the learned techniques exhibited profound increases in the release of epinephrine, which in turn led to increased production of anti-inflammatory mediators and subsequent dampening of the proinflammatory cytokine response elicited by intravenous administration of bacterial endotoxin. This study could have important implications for the treatment of a variety of conditions associated with excessive or persistent inflammation, especially autoimmune diseases in which therapies

> that antagonize proinflammatory cytokines have shown great benefit.[28]

It is great time to reconsider the role of drugs and their context of use in psychotherapy not as a mean of biopolitical constraint but of noopolitical enhancement. To recall Ivan Illich, 'people need new tools to work with rather than tools that 'work' for them.'[29] If it is doubtful that meditation practise alone vivify the despair of those that have already lost everything, we might now investigate what best 'technologies of self' enhance such therapeutic process.

Entheogenesis and Pharmacology

The use of pharmacological substance to enlighten perceptive awareness can be traced to the most ancestral times. Many anthropologists today such as Weston La Barre consider in fact that any concept of the divine or spirituality of any kind could most probably not have occurred without the ancestral relationship tribes always had with entheogenic plants –'generating the divine within'- commonly and cautiously used worldwide from pre-history until nowadays in traditional societies. Shamanism gave birth to religions, which origins are hardly dissociable from the use of those natural substances. Few people might know today that synthesised psychedelic lysergic as LSD or phénétylamines as MDMA (ecstasy) had become almost mainstream in the 1950s and 1960s American psychiatric community, as hundred of studies demonstrated its revolutionary potential in treating various conditions from depression to Post-traumatic stress and severe addictions with a quasi-absent dependency and toxicity risk; before research was hampered for 40 years in the name of economic, ideological and moral reason rather than from genuine scientific investigations.[30] If there is not enough time here to describe the results of all these studies in precision, we can focus on the most radical potentialities of the tryptamine Ibogaïne. Indeed its efficacy in treating various forms of chemical dependencies remain today dramatically underestimated, if not completely ignored. The Iboga root grows originally in Gabon and constitute the sacred psychoactive basis of the Bwiti religion as a tool to travel up to 15 hours through visionary realms of therapeutical and spiritual enlightenment. Previous Heroin addict Howard Lotsof, discover of Ibogaïne's anti-addictive effect after a series of clinical tests describes his awakening after his Ibogaïne experience as such:

> For the first time since months I did not feel the envy neither the need to take Heroin. In fact, I saw Heroin as a drug which only rhymed with death, and I wanted life. I looked at this large tree in front of me and I looked at the clouds in the sky and I realized that for the first time in my life I was not frightened, and perceived that my entire life had been full of fear. […] I don't know if you have knowledge on heroin dependency, but among the five out of seven for which the treatment worked, one was leaving with the two others that failed the treatment. He lived there with these two guys for six months, while they were injecting it every day, when he stayed clean. So, if you know about heroin dependency, you know how hard it is. So we knew we had there something unique.[31]

Among many of its neurobiological effects yet under-studied, its most important may be its selective antagonist action on NMDA receptors, the predominant molecular device controlling synaptic plasticity and memory function, which psychiatrists have shown linked to drug dependency.

> Facts suggests that ibogaine treatment provoke a resetting or normalization of neuronal adaptations underlying dependency. […] A great number of those that have tried their drug again after treatment notes that it doesn't act as before: effects are deceptive, or they have less taste, as if they had unlearned their addiction. The action of Ibogaïne on areas hypothezised to be implied in memory, learning and conditioned reflex –cerebral amygdala, hippocampus and frontal cortex- could explain such unlearning.[32]

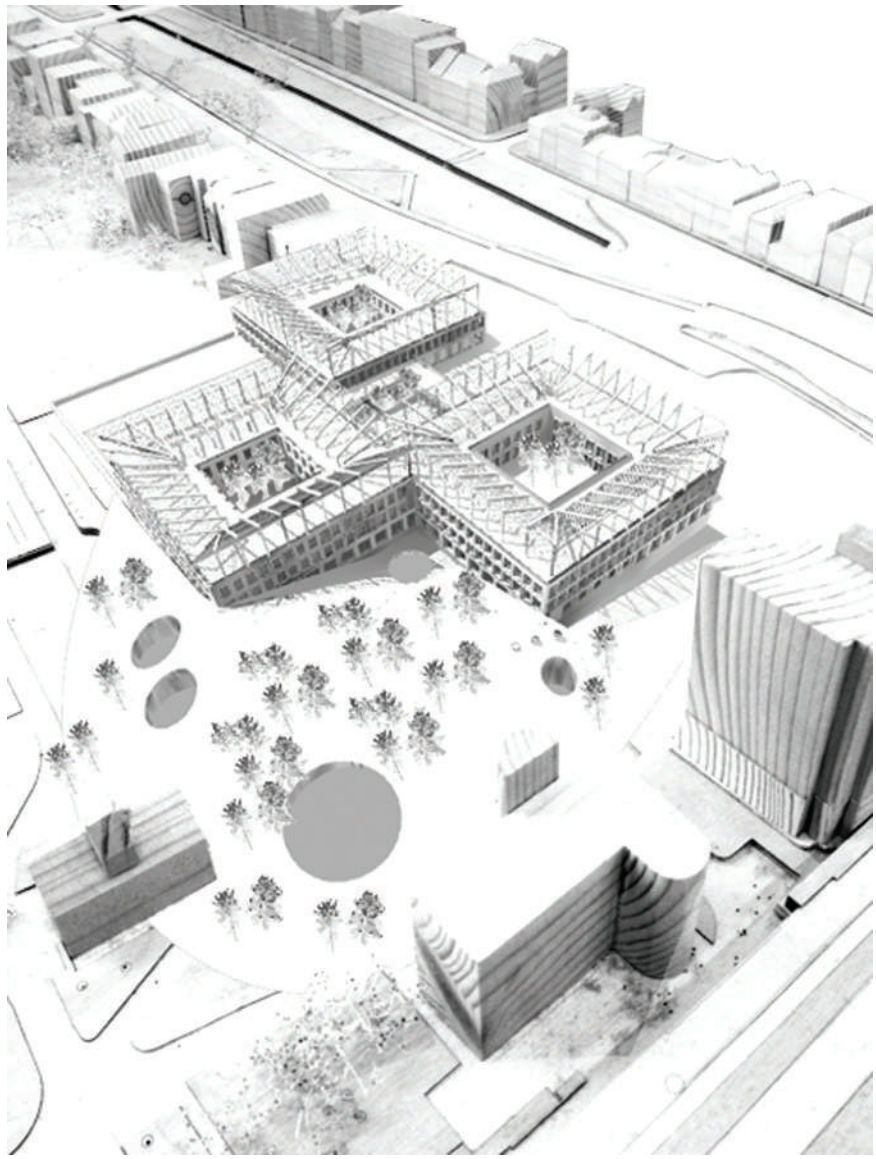


Fig. 3a: Underground circular spa and upper ground rectangular living as a Platonic dialectic between ancestral organic holism and modern specialized atomism. Source: Author.

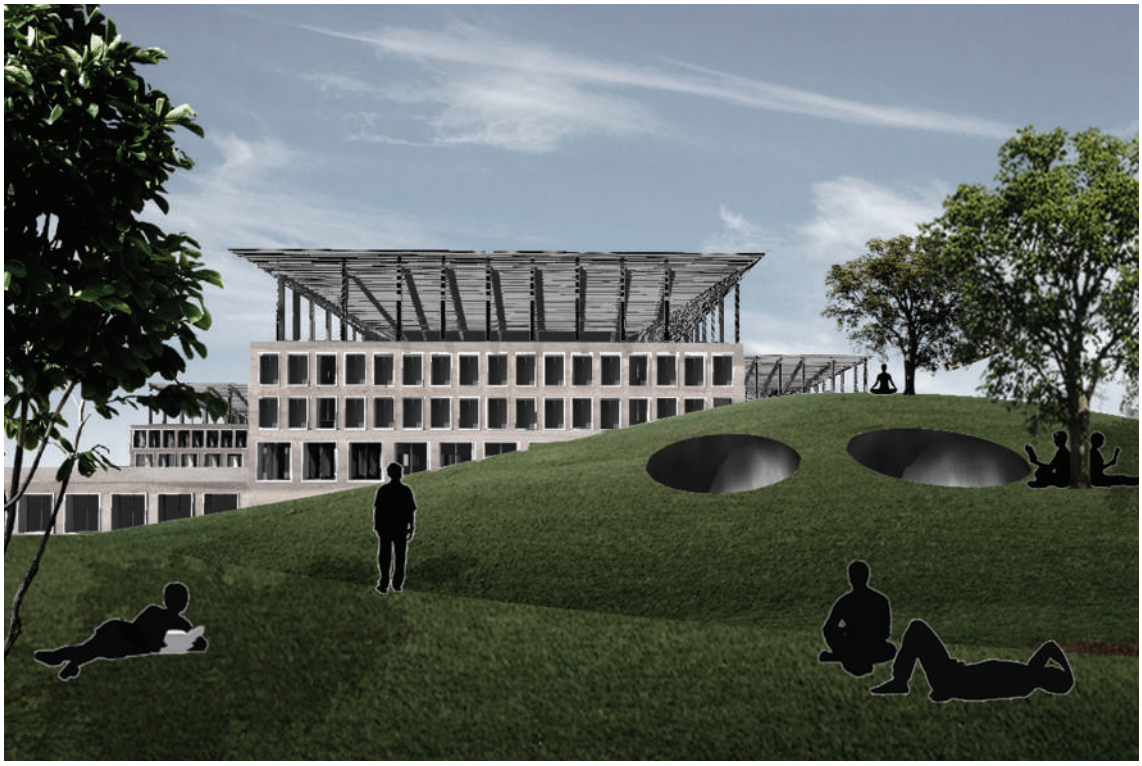


Fig. 3b: Underground circular spa and upper ground rectangular living as a Platonic dialectic between ancestral organic holism and modern specialized atomism. Source: Author.

It is crucial to stress that neither Ibogaïne, its Amazonian cousin Ayahuasca nor any psychedelic substance be experienced outside of a properly guided clinical context, as coupled with toxic industrial beverages or pills of all kind within ill-prepared conditions might lead to the most tragic outcomes. But used adequately they may very probably lead a neuroscientific revolution: studies have shown that long term users of Ayahuasca have usually better performance in cognitive functioning, mathematic ability as emotional and motivational well-being, higher elevation of serotoninergic impulse receptors in regular users, enhanced cooperation of the right and left hemispheres and increased cortical activity and abilities of information processing.[33] Ayahuasca therapy breaks down with the short-sighted value of the high-speed clinical market, as we know that if modern Selective Serotonin Reuptake Inhibitors as Prozac elevate serotoninergic synaptic impulse on the short term they block its natural recapture on the long term. Ayahuasca rituals allows a complete revision of mental processes to reach introspective knowledge about deeper aspects of our identity through re-awakening past traumas or inner conflicts ; and could be of great help in the treatment of some other great pathology of our time, as Dr Eduardo Schenberg writes:

> There is enough available evidence that Ayahuasca's active principles, especially DMT and harmine, have positive effects in some cell cultures used to study cancer, and in biochemical processes important in cancer treatment, both in vitro and in vivo. […] In summary, it is hypothesized that the combined actions of β-carbolines and DMT present in Ayahuasca may diminish tumour blood supply, activate apoptotic pathways, diminish cell proliferation, and change the energetic metabolic imbalance of cancer cells, which is known as the Warburg effect. […] Therefore, Ayahuasca may act on cancer hallmarks such as angiogenesis, apoptosis, and cell metabolism. If Ayahuasca is scientifically proven to have the healing potentials long recorded by anthropologists, explorers, and ethnobotanists, outlawing Ayahuasca or its medical use and denying people adequate access to its curative effects could be perceived as an infringement on human rights, a serious issue that demands careful and thorough discussion.[34]

Matter and Milieu

The ancient Mediterranean and shamanic worlds did not have the hospitals of hygienic sterility we inherit today. Before the advance of germ and genetic theories, the Greeks considered the soul as the first element of attention: the ills were treated either at home through itinerant doctors or taken away in temples dedicated to Asclepius, the God of Healing, in Idyllic places facing lakes and sees away from the dust of towns. Indeed the etymology of 'clinic' comes from the Greek *kline*, for couch or bed, the place where the dream takes place. It might be time for mental healthcare to reclaim its original semantic meaning, and contemporary clinical design could gain influence re-gathering pharmacological consumption with both ancestral practices and modern mystical technologies. Marshall McLuhan argued that 'if the nineteenth century was the age of the editorial chair, ours is the century of the psychiatrist's couch.'[35] Will the twenty-first century be the age of sensory deprivation tanks? Introduced by neuro-psychoanalyst and early psychonaut John Lilly in the 1950s, float tanks provide an isolated context to reach transcendental states that Buddhist monks takes years of daily training to access, abstracting body and mind from any kind of external stimuli -visual, thermic, gravitational, and auditory.[36] Floating in dark containers above Epsom salt solution at outer skin temperature, REST –for Restricted Environmental Stimuli Therapy- provides a context of deep states of altered consciousness, where ego and mind dissolve in a larger whole and time perception float free out of regular boundaries. Lilly felt he could communicate with other realms of reality, access other dimensions of thoughts and entities that our ordinary awareness doesn't allow us to reach. REST

could offer addicts an adequate context to slowly restore homeostatic endocrinal balance with very few mental will: Analytic data showed that hours of floating session result in consequent decrease of the Adrenocorticotropic hormones (ACTH**)** and plasma cortisol necessary for normal regulation of the HPA axis and stimulation of the serotoninergic activity, potential increase of endorphinergic activity –the body's own opiate-, and produce other physiological changes such as better circulation of blood pressure to reach unhealthy parts of the body potentially damaged by cardiovascular constriction.[37] Tanks allow a deconditioning of automatic and compulsive habbits to re-gain better self control and self awareness, away from the distress of a shopaholic world of behavioural economics that have sacrificed the growth of individual and collective happiness to the growth of the gross domestic product.

Physician Peter Suedfeld compared three groups of heavy smokers from 19 to 70 years old in three different REST sessions.[38] While floating smokers were delivered audio messages informing about the dangers of tobacco at three different time intervals, in session of 12h, 24h, or five times an hour within 14 days (flotation). The study showed smoking reduction by 51 percent after a three months follow up and 35 percent after 12 months. If REST therapy does not prevent anyone from smoking on every case, a daily relief from stress could restore homeostatic balance and re-regulate apoptosis to prevent the occurrence of lung cancers ; a long term noomedical hypothesis that still demand proof. The Potential changes on the immune and endocrinal systems through conscious effort and the neuroplastic structures of ion channels and synaptic functions through deep floatation sessions are yet vastly unexplored.

On Circularity

To reinterpret today the value of shamanic rituals as a mode of therapy one must reconsider its original settings. The evolution from tribal to civilized cultures as long being observed by anthropologists as a shift in architectural forms, from primitive round huts to fragmented and specialized rectangular plans. The unity of circular spaces represents an integral mode of therapy where shamans gather the role of spiritual guides and psychotherapists in an inclusive wholeness, embodying the connection with the divine mythos towards the open cosmos. Circular spaces distort the frontal power relationship one may have with his priest or psychiatrist, as the shaman is both conductor and inclusive participant of the collective trance. The project reinterprets the tribal form through a succession of circular baths and vertical isolation tanks for private psychic introspection organized around a central dome; and reinterpret the ancient ritual bathing culture of the Mediterranean coast in an hybrid typology mixing therapeutic floating and collective living.

Conclusion

The current global market and ecological crisis may be the best opportunity to question the values of a society locked in its conviction to possess the monopoly of universal truth. If the world of physics seems to re-orient itself away from a deterministic and mechanistic vision of reality where the subjective mind cease to be seen as antagonist with matter but rather influential in its formation, healthcare design could break off from its present status of great garage which mission is to repair the defaulted mechanic but rather become a support for revealing the unexpected depth and mysteries of our souls.[39] But one does not need a belief in supernatural entities of any kind, nor fear any moral sectarian indoctrination to reconnect with the inner wisdom of transcendental exercises. To recall Foucault once more, I predict that what might happen to our drug morality is what happened to our sexual morality in the early twentieth century: if the end of the nineteenth century puritanism rediscovered sexuality as an object of science in psychoanalysis and psychopathology, the end of the twentieth century psychedelic drug puritanism might very certainly

lead to their rediscovery as a tool for therapy in the twenty first century. But what phrase can better resume the present dead-end that Sanche de Gramont definition of the Cartesian scientist: 'It does not matter that his findings were inaccurate, as long the method was convincing. […] A general who devises a perfect plan with incomplete information about enemy capacity and goes into elegant defeat, is Cartesian.'[40] To re-appreciate the therapeutic values of oneiric mysticism abstracted from the weight of institutionalized religions, whether fundamentally theists or materialistically atheists, might be one of the biggest challenge of the twenty-first century to help *Homo Addictus Oeconomicus* reconnect with *Homo Demens*, the man that dreams.

Notes

1. Borrowed from Tsvia Horesh in David Aldrige and Jörg Fachner eds, *Music and Altered States: Consciousness, Transcendence, Therapy and Addictions* (London: Jessica Kingsley Publishers, 2006), p. 125.
2. World Health Organization, tobacco fact sheet n°339 (May 2014), <http://www.who.int/mediacentre/factsheets/fs339/en> [accessed 20 March 2015].
3. World Health Organization, alcohol fact sheet n°349 (January 2015), <http://www.who.int/mediacentre/factsheets/fs349/en> [accessed 20 March 2015].
4. Gary Null, et al., eds., 'Death by Medicine' (2006), <http://www.webdc.com/pdfs/deathbymedicine.pdf> [accessed 20 March 2015].
5. Alain de Botton, *Religion for Atheists* (London: Penguin Group, 2012), p. 79.
6. LSE Expert Group on the Economics of Drug Policy, *Ending the Drug Wars* (2014), p. 3, <http://www.lse.ac.uk/IDEAS/publications/reports/pdf/LSE-IDEAS-DRUGS-REPORT-FINAL-WEB.pdf> [accessed 20 March 2015].
7. Deborah Hauptmann and Warren Neidich, eds., *Cognitive Architecture: From Biopolitics to Noopolitics* (Rotterdam: 010 publishers, 2010).
8. Alfred Korzybski, *Science and Sanity: an Introduction to non-Aristotelian Systems and General Semantics* (New York: Country Life Press Corporation, 1933).
9. Gabor Maté, *When the Body Says No -exploring the stress-disease connection* (New Jersey: John Wiley & Sons, 2003), p. xi.
10. David J Nutt, Leslie A King, Lawrence D Phillips, 'Drug harms in the UK: a multicriteria decision analysis', *The Lancet* (November 1, 2010), vol 376, pp. 1558-65, <http://www.sg.unimaas.nl/_OLD/oudelezingen/dddsd.pdf> [accessed 20 March 2015].
11. M.W. van Laar, et al., eds., *Netherlands National Drug Monitor: NDM Annual Report 2010*, <http://www.trimbos.org/~/media/English%20site/AF1106%20NDM%20Annual%20Report%202010_web.ashx> [accessed 20 March 2015].
12. Richard Lawrence Miller, *Drug Warriors and Their Prey: From Police Power to Police State* (Westport: Praeger Publisher, 1996), p. 2.
13. David T. Courtwright, *Forces of Habit: Drugs and the Making of the Modern World* (Cambridge Mass.: Harvard University Press, 2001).
14. Ivan Illich, *Medical Nemesis: The Expropriation of Health* (New York: Pantheon Books, 1976).
15. Tom Feiling, *The Candy Machine. How Cocaine Took Over the World* (London, Penguin Books, 2009).
16. Glenn Greenwald, *Drug Decriminalization in Portugal: Lesson For Creating Fair and Successful Drug Policies* (Washington D.C: Cato Institute, 2009).
17. Agnes van der Poel, *Low-treshold Care for Marginalised Hard Drug Users: Marginalisation and Socialisation in the Rotterdam Hard Drug Scene* (The Hague: Basement Grafische Producties, 2009).
18. Bruce Wexler, 'Shaping the Environment that Shape our Brains: a long term perspective' in *Cognitive Architecture: From Biopolitics to Noopolitics*, ed. by Deborah Hauptmann and Warren Neidich (Rotterdam: 010 publishers, 2010), pp. 142-67.
19. Kenneth G. Walton and Debra Levitsky, 'A Neuroendocrine Mechanism for the Reduction of Drug Use and Addictions by Transcendental Meditation' in *Self-Recovery*, ed. by David O'Connell and Charles N. Alexander (Bighampton: Harrington Park Press,

1994), pp. 89-112.

20. Gabor Maté, 'Why Punish Pain?', *Yes!* (2011), <http://www.yesmagazine.org/issues/beyond-prisons/why-punish-pain> [accessed 14 March 2015].
21. Gabor Maté, *In the Realm of Hungry Ghosts: Close Encounter with Addiction* (Berkeley: North Atlantic Books, 2008).
22. Bruce Alexander, *The Globalization of Addiction: A Study In Poverty of the Spirit* (Oxford University Press, 2010).
23. Jeffrey M.Schwartz, Henry P. Stapp and Mario Beauregard, 'Quantum Physics in Neuroscience and Psychology: a Neurophysical Model of Mind-Brain Interaction', *Philosophical Transactions of the Royal Society B: Biological Sciences*, 360 (June 2005), pp. 1309-27.
24. Jeffrey M.Schwartz and Sharon Begley, *The Mind and the Brain: Neuroplasticity and the Power of Mental Force* (New York: Harper Collins, 2002).
25. M.K. Pope and T.W. Smith, 'Cortisol excretion in high and low cynically hostile men', *Psychosomatic Medicine*, 53 (1991), pp. 386-92.
26. W.Jung and M.Irwin, 'Reduction of Natural Killer Cytotoxic Activity in Major Depression: Interaction between Depression and Cigarette Smoking', *Psychosomatic Medicine* 61 (1999), pp. 263-70.
27. C.Tournier, et al., 'Requirement of JNK for Stress-Induced Activation of the Cytochrome c-mediated Death Pathway', *Science* 288 (May 2000), pp. 870-4.
28. Matthijs Kox, et al., 'Voluntary Activation of the Sympathetic Nervous System and Attenuation of the Innate Immune Response in Humans', *Proceedings of the National Academy of Sciences of the United States of America*, 111/20 (May 2014), pp. 7374-79
29. Ivan Illich, *Tools for Conviviality* (New York: Harper & Row, 1973), p. 27.
30. Ben Sessa, 'Turn on and Tune in to Evidence-Based Psychedelic Research', *The Lancet Psychiatry* 2/1 (January 2015), pp. 10-12.
31. Howard Lotsof cited by Olivier Chambon, *La Médecine Psychédélique: Le Pouvoir Thérapeutique des Hallucinogènes* (Paris: Les Arènes, 2007), p. 214, Translated from French by the author.
32. Ibid., p. 217.
33. Charles S. Grob, et al., 'Ayahuasca in Adolescence: A Preliminary Psychiatric Assessment', *Journal of Psychoactive Drugs*, 37/2 (June 2005), pp. 129-32.
34. Eduardo E. Schenberg, 'Ayahuasca and cancer treatment', *SAGE open medicine* 1 (Jan-Dec 2013), pp. 1-12 (p. 6).
35. Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: The New American Library, 1964), p. 21.
36. John C. Lilly, *The Deep Self: Profound Relaxation and the Tank Isolation Technique* (New York: Simon & Shuster, 1977).
37. John W. Turner and Thomas H. Fine, 'Effects of Relaxation Associated With Brief Restricted Environmental Stimulation Therapy (REST) on Plasma Cortisol', *ACTH and LH, Biofeedback and Self-Regulation* 8/1(1983), pp. 115-25 Cf. Michael Hutchinson, *The Book of Floating: Exploring the Private Sea* (Nevada City: Gateway Books, 1984).
38. Peter Suedfeld and Gloria Baker-Brown, 'Restricted Environmental Stimulation Therapy of Smoking: A Parametric Study', *Addictive Behaviors* 12 (1987), pp.263-7.
39. Henry P. Stapp, *Mind, Matter & Quantum Mechanics* (Berkeley: Springer, 2009). See also James Jeans, *The Mysterious Universe* (New York: Cambridge University Press, 1930).
40. Cited by Lynn Payer, in Medicine and Culture (London: Penguin Group, 1988) pp. 38-9.

Biography

Arthur Waisblat is a French architect and musician born and raised in Paris where he graduated in fusion jazz and Afro-Cuban drumming, before recently completing his engineer master degree from TU Delft University. He aims at bridging links between creative, reflexive and scientific fields of knowledge and practices in appearance kept apart from one other, with a particular interest in global politics and ancestral modes of shamanic therapy. He currently works, researches and composes in Amsterdam.

Critical and Clinical Cartographies:

International Conference Proceedings

The Proceedings are published in collaboration:
Jap Sam Books and the Architecture Theory Chair,
Faculty of Architecture and The Built Environment,
Delft University of Technology,
PO Box 5043, 2600 GA Delft,
The Netherlands
+31 015 27 81830
AT-BK@tudelft.nl
www.tudelft-architecture.nl/chairs/architecture-theory
www.facebook.com/ArchitectureTheoryTUDelft

Editors
Andrej Radman
Stavros Kousoulas

Layout Editor
Meagan Kerr

Authors
Andrej Radman
Stavros Kousoulas
Robert Alexander Gorny
Dulmini Perera
Katharina D. Martin
Halbe Hessel Kuipers
Arthur Waisblat

Architecture Theory
Interim Chair
Carola Hein

TU Delft
Delft University of Technology

JAPSAM
BOOKS

ISBN: 978-94-90322-58-8
www.japsambooks.nl