



Permanent Change

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Plastics in Architecture and Engineering

The song of S(t)ylene¹

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Syren = Sirène (French) = Mermaid

*Styrene = also known as **vinyl benzene**, is an organic compound with the chemical formula $C_6H_5CH=CH_2$. This derivative of benzene is a colorless oily liquid that evaporates easily and has both a sweet smell and high toxicity.*

Once upon a time..happily for ever not afterthe plasticology seems to be a perfectstory telling..., for unfoldingthe historical dispute between the fossil and living nature, between what is decomposed, and has laid deep within the earth for millions of years, and what is cultivated in real time, seasonally, on the surface of planet. The opposition between the organic and the inorganic could be posed instead in terms of the secondary effect of each substance, by asking what kind of smoke do we want to breathe? Would we prefer the psychedelic travel enabled by plants, in the pursuit of William Burroughs and Carlos Castaneda, chosing to intoxicate our minds, or do we prefer the floating, invisible particle residue of the petro-chemical industry, chosing to pollute our lungs by breathing what's left of the BP, Exxon, Total's oil, byproducts consubstantial with the ideology of progress, mass-industrialization, proto and crypto capitalism, and mainly dedicated to the comforts of a "western" standard of living.

The reader might legitimately feel confused by the introduction of these alternative pathologies – smoking the postindustrial effluences from plastic industries or smoking weeds

associated with various shamanistic practices, but in 1937, the debate was precisely on this point. Through the Marihuana Tax Act², the Roosevelt administration decided to tax the entire hemp production chain, from farmers, to resellers and consumers, so as to directly support its direct competitor and synthetic clone, the patented DuPont material: Nylon.

The most relevant detail is not that prohibition by taxation was a puritan adaptation of the earlier prohibition of alcohol rather it is the manner in which industrial companies such as DuPont defined a lobbying strategy of an “innovation by substitution”, using the synthesis of fossilized nature to produce similar by-products³, a belated, industrial echo of the first Neolithic plants “tamed” by humans⁴.

There is a simultaneous analogy and dissymmetry between oil extracted from decomposed nature and hemp from a cultivated one, in terms of potential of transformation, physical behavior, strength, resistance and characteristic of manufactured products. More effectively, the main dissymmetry arises from the strategy of concentrating power and economy, which is at the base of production and social organization. = It should be ridiculous to compare the world empire of petrochemistry, born from the capitalist economical system with the disseminated agriculture, with a multitude of owners and different local implications, stuttering between top-down and bottom-up.

Synthetic nature appears to be in diametric opposition to the natural one: economically, politically, ecologically and capitalistically. In the twentieth-century, the oil versus hemp battle resulted in a complete eradication of the hemp and a domination of oil including the control of the means of extraction, of the science at the base of the transformation and of the global market, with the infrastructure of the United States serving as a vector of dissemination and massification⁵. The animated nature of the multitude of ingredients, the

hand-made knowledge of various expressions, anomalies and singularities, in turn at the base of Crafty Alibaba 'goods'⁶ to the fossilized, transformed, nature of industry, used for spreading needs and desires through a massive, repetitive⁷, standardized and advertised production dedicated to an ideology of progress vectorized by branding. This factual transition seems simple but the irony of history, due to unexpected reasons like price and rarefaction of oil, civilization war on black gold shadows, consciousness of the collateral effect, mutation of capitalism, etc., hemp has returned in the United States. , Beginning in California, as a key site for agricultural production, invading many other US states, but this time just for drugs, a medical alibi with pseudo-prescription by pseudo-doctor, concealing the original reason for its prohibition: – voracious industrial competition.

Now we have a choice: **What kind of smoking or non-smoking pollution do we prefer to affect our lungs and minds: monoxide smog or the smoker's arabesque? .**

In this global *malentendu*, full of logical stuttering, pure nonsense, and absurdity, can we define a trajectory which reveals this antagonism without falling into cynical reductionism or political naivety?⁸ Can we simultaneously develop a resistance and a resilience through a positive criticism, which can rearticulate the relationship between commodities and their *raison d'être*, between singularities and technologies? What potential is there in the historical and intrinsic conflict of these two natures? In their whispering might they tell us something else?

I would like to contribute some apparatuses and scenarios to the debate that reveal some of these antagonisms, projects that navigate from the recognition of pollution, shifting from an aesthetic that could be called "petroplasticology", a controlled and accurate technology, toward some potential substitution by "bioplastic", plastic that has a specific life span, which

could be described as a chemical advantage for self-organized, undetermined structures, and for a hypothesis of political non-master planning. It boils down to the following questions.

FIG 1. Filtration, La Baïse, 1997

Can we use petro plastic as a filter for collecting other types of plastics, where a voluntary, domesticated pollution will attract “wild” pollution, taking on an ambiguous status and an aesthetic of visible decomposition? “Project Filtration” is a simple 10,000 sq development of a river-bank, which carries nitrate and insecticide plastic bag residues abandoned by farmers in their fields, as if awaiting a natural depolluting service that will erase the traces of their chemical addiction. of the river to be used as a depolluting natural service in charge of erasing the trace of their chemical addictionAnd paradoxically back to the visible spectrum when the river is down again, hanging from the branches, all over the river...

FIG. 2 Project Shearing (France, 2001)

Can we use petroplastic for organizing a simulacrum of its own impermanency and apparent fragility? Unfolding in the countryside, an authorized, non-biodegradable petrochemical fabric is used for the whole envelope, an envelope which is spread out and disseminated amidst the surrounding nature to preserve newly planted trees from destruction at the hands of rabbits, creating domesticity out of an agro-industrial logic?

Fig. 3 Project Mosquitosbottleneck, (Trinidad, 2003)

Can we use petroplastic as a survival strategy in a hostile situation, trying to negotiate with the infestation of the Nile Virus carried by mosquitos, for the recognition of this disease as an objective paranoia triggering strategies for safety in a weekend residential house?

Through a Klein bottle apparatus, the fragile net preserves, protects, and disjoins the living

inhabitant in resonance with the death of the insects. The sound of their agony, buzzing within the double trapped membrane, becomes the proof of the efficiency of the system, preserving human against nature, against its offensive biotope, protected and surrounded by the theatre of its own barbarism.

Fig. 4 Project HybridMuscle (Thailand, 2003)

Can we use petroplastic in an endogenous-exogenous strategy? Extracted from the recesses of the earth, petroplastic can be a paradoxical agent of territorialization. A house for classes and siestas—a computational, yet hand-made, local production—is driven by a local mammal, a generating station whose gears are attached to a two-ton steel counterweight powering the pneumatic movement of the elastomer membrane, aerating the hot and sweaty climate.

Fig. 5 Project hypnosis room (Paris 2006/Japan 2012)

Can petroplastic be a potential for innovation in fabrication processes, controlled by five-axis machines and computation design, in a strategic escape from a phantasm of scientific and positivism procedures? In the chamber of *Hypnosis Room*, one is able to dream of another reality, with the help of a hypnosis session done with François Roustang, the hypnosis specialist of Jacques Lacan. This “hypnochamber” is at the articulation between petroplastic and bioplastic and suggests something similar to the anime classic *Ghost in the Shell* (1995)⁹. The immersion through “magnetism”¹⁰ triggers the consciousness of the possibility of another environment emerging from bottom-up procedures, the opposite of the type of repetition and seriality that has defined petroplastic industrial components.

Fig. 6 “Project thingswhichnecrose,” (Denmark and Louisiana, 2010)

Can we use bioplastic from agriculture as a recognition of a potential of life span in design and construction processes, using the characteristics and specificities of starch, flax, wheat, corn and other agricultural products to discover the behavior of bioplastic's decay protocols? By the regulating the degree of humidity in the atmosphere through a mixture of bio-plastic and hydro-soluble polymer, the structure slowly undergoes a controlled necrosis. Unlike petro-chemistry, bioplastics do not pretend to be perennial, as architecture they are intrinsically biodegradable.

Fig. 7 "An architecture des humeurs" (Paris, 2011)

Can we use bioplastic from agriculture as a political potential towards an engineering discovery, for a self-organized urbanism conditioned by a bottom-up system in which the multitudes¹¹ are able to drive the entropy of their own system of construction and develop their own system of *vivre ensemble* (living-in-common)? Based on the potential offered by contemporary bioscience, together with the re-reading of human corporality in terms of physiology and chemical balance, it is possible to make palpable and perceptible the emotional transactions of the "animal body," the headless body, the body's chemistry, and in a way that informs us about the adaptation, sympathy, empathy and conflict of individuals when confronted with a particular situation or environment. The *malentendus* of this new condition result in an endless process of construction through a combination of mechanization and indetermination, resulting in unpredictable behavior; the development of a secretive, weaving machine that can generate a vertical structure by means of extrusion and sintering (full-size 3D printing) using a hybrid raw material (a bioplastic-cement) that chemically agglomerates to physically constitute the computational trajectories.

This structural calligraphy of such a system might work as a mechanized stereotomy, comprised of successive geometries according to a strategy of permanent production of anomalies with no standardization or repetition, except for the procedures and protocols that lie at the base of this technoïd slums emergences and research.

Captions:

“Project Filtration” (France, La Baïse 1996[Above it says 1996, which is it?]).

“Project Shearing” (France, 2001)

“Project Mosquitosbottleneck” (Trinidad, 2003)

“Project HybridMuscle” (Thailand, 2003) is a simple battery house, for classes and siesta, as a computation hand-made local production

“Project hypnosis room”, 30 sq. m, (indoor in Paris, 2006) and (outdoor in Japan, 2012)

“Project thingswhichnecrose”, 1,000 sq. m (Denmark and Louisiana, 2010) prototype project

“An architecture des humeurs” (Paris, 2011)

Credits

Filtration , La Baïse, 1997

Realisation of Tourism design on a bank of a wild river, first step production of a prototype on 5000 m² in 1997, the site of Vianne, on the river " la Baïse ".

Commission following a competition.

Architect: R&Sie(n)... Paris

(name of the agency at this time : Roche, DSV & Sie)

Creative team and associates partner : François Roche, Stephanie Lavaux, Gilles Desévéday

Scenario:

- 1) Realisation of a roof in plastic like a floating jellyfish in trees
- 2) Waiting the rising of the river.
- 3) Using this design like a metaphoric and literal filter of pollution.

Shearing

Sommières, 2001, France

Architect: R&Sie(n)... Paris

Creative team and associated partners: François Roche, Stéphanie Lavaux, Alexandre Boulin,
Olivier Legrand

Engineer: Abaca Engineer

Contractor: Christian Hubert de Lisle

Key dimensions: 160 m²

Client: Ami & Judith Barak

Cost: 0,16 million USD

Text:

Design of a house for Judith and Ami Barak, director of an art centre in Montpellier, in the
South of France

Scenario:

- 1) Exacerbation of the landscape like a new geological fold to obtain stealthiness.

2) Design of a house like a sheared upthrust rock layer alongside an existing stone wall in the middle of the field.

3) Tent-like construction to provide protection from weather, with living spaces inside.

Mosquito bottleneck

Trinidad, 2003

Architect: R&Sie(n)...Paris

Designer: Mathieu Lehanneur

Creative team: François Roche, Mathieu Lehanneur, Stéphanie Lavaux, Jean

Navarro, Pascal Bertholio

Key dimensions: 130 m²

Client: Ema and Cesar Reyes, Trinidad

Cost: 200,000 USD

Text:

Construction of a private house for an art collector in Trinidad.

Scenario:

1) Detection of the mosquito-borne West Nil Fever virus on the island.

2) Mixing this objective paranoia with a desire for safety.

3) Developing a Klein-bottle twist between the two contradictory data:

humans and insects.

4) Living and dying of mosquitoes in the house trap.

5) Introducing a fragile structure and materials, like fabric netting everywhere, in recognition of the geographic position of this island, naturally protected against hurricanes.

6) Weaving together all the surfaces of the house – floor, façade and roof – with plastic wire and plastic shrink-wrap.

7) Resonance between the buzzing of the mosquitoes and the vibration of the structure.

hybridmuscle

Chang Mai, Thailand, 2003

Scenario : “The Game”, François Roche & Philippe Parreno

Architect: R&Sie(n)...

Contractor: Christian Hubert de Lisle, ADS

Creative team: François Roche, Stéphanie Lavaux, Jean Navarro

Key dimensions: 130 m2

Client: The Land, Rirkirt Tiravanija,

Cost: 65,000 USD

Text:

Construction of a work and exhibition space that would generate its own electricity and thus be “unplugged” from the power grid. Private commission.

Scenario:

1) Construction of an animal “engine” driven by the muscle power of a pachyderm. Storage of the mechanical energy through the lifting of a two-ton steel counterweight.

Transformation of the mechanical energy into electrical energy. To power ten light bulbs, laptops, and cell phones.

2) Natural ventilation through the quivering of the façade leafs made of sheets of silicon that work in the same way as temporary shelters made of teak leaves.

Postscript : An albino Buffalo replaced the Elephant.

Hypnosischamber

Mam, Modern Art Museum, Paris, 2005

Architect: R&Sie(n) with Benoit Durandin... Paris

Creative team and associates partner: François Roche, Stephanie Lavaux, Jean Navarro,
Benoit Durandin

Seats shell ; Design by Mathieu Lehanneur

Hypnosis specialist ; François Roustang.

Key dimensions: 15 m2

Client : Mam / Mudam

Cost: 0,12 M€

Text:

Experiment of hypnosis individual session in the research and exhibition “I’ve heard about”.

Scenario:

- 1) Enter in a “heterotopian” cognitive room.
- 2) You dive in a “waking dream”, filled by vocal information about “I’ve heard about” experiment, where citizen are involved to create the city as an extension of the cartography of their mind and desires / R&Sie(n) Museum of Modern Art 2006 – Paris ,
- 3) Feel yourself as a nerve ending within the organic and self-determination growing structure.
- 4) Keep the speculation and experiment alive as a possibility of transformation of your own biotope.

things which necrose

Denmark 2009 + Suede 2010

Architect: R&Sie(n)... Paris

Creative team: François Roche, Stéphanie Lavaux

Collaborator : Maxime Aumon-Bemelmans

Contractor : CHD / Christian Hubert Delisle

Key dimensions: 10 m² (Denmark) + 400 m² Stockholm

Client:

- Louisiana Museum of Modern Art, Denmark. Kjeld Kjeldsen, Arne Schmidt-Petersen

- Stockholm 2010, Suede. Jan Aman, Färgfabriken / Jacob Fant, Rewir

Cost: 60 000 euros + 1.5 m euros

Design : Limited time span & biodegradable pavilion + prototype

Scenario:

- 1) Developing a bio-plastic with hydro-soluble polymer from agriculture.
- 2) Designing a paneling relief, integrating membrane and structure of the building, which could be strategically and slowly “necrosed” by the control of the degree of humidity in atmosphere.
- 3) Developing the injection mould by CNC machine processing, 5 axes
- 4) Adding some mist nozzle to emphasize or reduce this disappearing protocol, as a dimmer system.
- 5) Adjusting the life span of a temporary building (one floor for the first experiment), from its construction to its melting down.

An architecture “des humeurs”

Le Laboratoire / Paris, Graz Kunsthaus / Austria, Tinguely museum / Basel

Date : 2010-11

Architect: R&Sie(n)... Paris

Creative team: François Roche, Stephanie Lavaux, Kiuchi Toshikatsu, Stephan Henrich ,

François Jouve, with Winston Hampel, Natanel Elfassy, Marc Fornes, Gaetan Robillard...

Key dimensions: exhibition-research on 600 m²

Client: Le Laboratoire

Cost: 0.15 m €

Text:

Urban experiment of a flat, fat growing processes and entropic indeterminism.

Scenario:

- 1) Extraction of human chemistry data through a protocols of interview and Nano-particles.
- 2) Elaboration of mathematics (theory of belonging) approach to reveal the “malentendu” between the notion of “free will” and the headless bio-chemistry concentration (dopamine, serotonin, adrenaline, cortisol) to reveal the multitudes of morphologies of living (internal and osmotic logic between cells)
- 3) Aggregation of “volumetric” habitats through task-cellular automata
- 4) Developing a mathematical script to generate an emerging structure as a resulting geometry, with structural optimization both incremental and recursive.
- 5) Developing a bio-cement, with polymerization specificity to construct physically this (n)certain and complex metabolist fragment

- 6) Developing a machinism process to secrete and extrude the bio-polymers stick and realize a weaved system and intricacy territory
- 7) Releasing the structure from achievement and shape control, to engage a step by step re-negotiation of “the movement going to be done”

¹ *Le Chant du Styrene The song of Styrene, (1959) 19 mins., color. Directed by Alain Resnais, text by Raymond Queneau.*

² *A small shortcut history / 8000 B.C. woven fabric from hemp / 1619 Jamestown Colony, Virginia passes law requiring farmers to grow hemp / 1666, Colbert created in France the “Corderie Royale” to assume the quality and quantity of production (ropes and sails) / 1794, George Washington advised “Make the most of the Indian hemp seed and sow it everywhere” / 1840, 176 000 hectares of Hemp in France / 1919, 18th Amendment to the Constitution for alcohol prohibition / 1933, 21st Amendment to the Constitution for the end of alcohol prohibition / 1937, Marijuana Tax Act from Harry J. Anslinger / 1941, Hemp for Victory, propaganda movie of US army to relaunch the hemp production for the war effort, and simultaneously the Hemp Car of Henry Ford for the farmer to relaunch the hemp production and their economy to buy a car from their production...*

³ *As fiber, fabric, oil, rope, celluloid, paper, bensing, moulded processes... even the Henry Ford hemp car in 1941.*

⁴ *Hemp has been prohibited in Japan, in 1948, by General Mac Arthur / The prohibition in European country was one of the conditions of the application of the Marshall plan, for the launching of the economy of reconstruction after second war cataclysm. The both are referring to Marijuana Tax Act of 1937.*

⁵ *We have to recognize that plastic was a good boy, or good girl, for capitalist processes. We could even argue that they have the same genome, the same DNA : the parallel between one mold amortized by millions of similar repetitive prints and clones and the pyramidal managerial schema which underlie both production and profit fit to perfection, as an ideal scientific-politico-economical business plan.*

⁶ *In a sense of John Ruskin “Stone of Venice” or Walter Benjamin, in his 1936 essay, “The Work of Art in the Age of Mechanical Reproduction [Can you provide a little more information on these references?]*

⁸ *Conventionally translated as misunderstanding, malentendu is literally mishearing.*

⁹ *Ghost in the Shell, 1995, movie of Mamoru Oshii*

¹⁰ *as the somnambulist (Sleeping walker) German and French feminist movement in XIX century, using cession of hypnosis (called magnetism at this period) for an attempt to develop spaces of freedom, egalitarian un-racial, un-sexist social contract, that could not be perceived and explored except in this state, in this other layer... dismissing the possibility of modifying the “system” and its real mechanisms, to admit our weakness on the contrary, and by the way create a different and distanced layer of*

existence somewhere out of reach. Although diabolized and treated as charlatanism, nevertheless all of pre-modern reformist thought drew on this movement...

¹¹ *In Spinoza's and Antonio Negri's senses, developed by Antonio Negri in "the Wild Anomalies". [Please provide references]*