UNDER THE SURFACE OF A RED LAGOON

Commons

UNDER THE SURFACE OF A RED LAGOON

UNFOLDING THE MANY LAYERS OF MEDIA MATERIALITY



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With the acceptance of the term Anthropocene, we now face the fact that anthropogenic-capitalist actions on nature are shaping a new form of aesthetic made up of pollution and toxicity. As an artist and researcher, I'm aiming to process this new era through the lens and perspective of a subjective inquiry, reflecting on the image/landscape itself as a participant in the political ontology of toxifying technologies. It concerns the intoxicated vibrant matter and its ecology, which ties the lithosphere, the biosphere and the technosphere. In order to articulate these scales and disciplines, I focus my case study on a visually loud, but epistemically silent red lake of dumped bauxite waste situated in Tulcea, a city on the Danube in Romania.

My research works with a set of questions raised from different disciplines yet articulated in a web of key principles in the present paper. Entanglement lies at the heart of the relation between aesthetics and toxicity, and it is, therefore, desirable to understand its discrepancies in the context of a broader theoretical discourse, namely that which contrasts representation and materiality within an image. Environmental catastrophes are attracting widespread interest all over the world, images circulate on news broadcasts as well as on social media or are captured in works of art. For this reason, I find it challenging to map the image-capacity of the bauxite waste, or in a form of question; what kind of ontological image does this polluted lake might produce?

The approach I have used in this research aims to prove that the matter is a form of media. With this in mind, the image is opposed to knowledge whereas matter itself generates knowledge. In fact, it is a new status to the image as it is not a merely fixed representation or inert index, but a productive agent. The other purpose of this study is to describe and examine the possible agencies of toxic matter.

In the key moments of my research, I unfold and analyse hidden characteristics that are laying under the surface of an image, in particular, a series of my pictures taken on the site of the red lake in 2014. These moments open up with ecological, economical and political issues related to the red mud through a narrative field based on my empirical experience. It is followed by an image/media theory question about representation, which is inextricably bound to ethics and the biopolitics of capitalism. I also share the experience of my latter fieldwork while unveiling the vocabulary and the development of the research. Then, empiricism is brought into a discursive space marked by the idea of an ontological shift of perspective, considering matter as a form of media. Finally, this work tends to provide a possible solution, a strategy to activate my own artistic practice within a community of hackers, scientists and people with ecological awareness.

KEY MOMENT #1 THE DISCOVERY OF A RED LAKE

August 2014. I am in Romania for the fourth time, working on the vestiges of the Soviet era. This country offers many fascinating insights into how a political regime could radically and efficiently shape architecture, urbanism, landscapes, social organisation and repression. More than 25 years after Romanian Revolution, the country is still struggling with its reconstruction after State collapse, corruption and EU governance. The phantoms of the so-called socialist era are embedded in many landscapes, cities and villages: creepy industrial ruins and cracked pipelines seem to look on as nature reclaims its rights from a time of mass production. I have been working many years already on these Stalker-like locations, but I'm not yet feeling confident enough to publish these pictures of a story that isn't mine. On a trip to Bucharest in 2013, I was talking with Romanian friends about politics and industrial ruins; an architect friend lent me a well-documented book about Romania's industrial landscape. My attention stuck on a double page that was very different from most of the rusty steel structures I've already seen: A huge bloody red lake coming out of nowhere. For many months this place has been echoing in my mind like an afterimage of something actually witnessed. Finally, I decide to go there to see for myself.

Once in Tulcea, it is not easy to find the lake. Google satellite imagery helps me to identify its location, which is invisible from the ground. After a while, we can trace a truck climbing a little road. The entrance of the site is well guarded and of course, access is forbidden. Excited by the proximity of the goal, we take another road through the neighbouring village, cross fields and thorns. And here we are.

Standing at the bauxite-waste lake, transfixed in the horrible/sublime visual scene of this awkward landscape, all my senses are sending me subconscious warnings. I am too far away to measure and understand the deep violence of this industry and its worldwide tectonics. I have not yet faced its huge political background. At first, it is not even clear to me what kind of action is shaping this red lake. Later, Google map gives me a clue with its name: *Lacul rezidual de bauxită Mineri*. The only thing I am aware of to begin with is that we are facing industrial waste in massive dimensions, never experienced before. But there are no fences or no warning signs. We have no idea what kind of pollution this is, and we are more worried about running into security staff or cops. A sweet chemical smell accompanies our steps, and no signs of life are noticeable in the red water.

Back in Geneva, I integrate this picture into a landscape series I am working on, about real panoramas that look like computer generated ones. This image has a big impact on people I showed it to. All of them call attention to its beauty. As time passes, this emphasis on visual beauty makes me more and more uncomfortable. I feel that a lot more is at stake, but I don't find a method to process it in a more accurate way. I let it incubate for two years.





KEY MOMENT #2 PHOTOGRAPHY IN THE ERA OF THE ANTHROPOCENE

[#2_001] POLITICS OF REPRESENTATION

"From a molecular point of view each attempt at ideological unification is a reactionary operation¹."

C. BRUNNER, R. NIGRO AND G. RAUNING

How does matter matter? Some disasters are not visible but they are real, they do exist. Radioactivity is a good example in that sense. Hence, some disasters are neither spectacular nor dramatized and not even mediatized. This is one of the notions that underlies Rob Nixon's term of *slow violence*. Photography is not necessarily a good ally as the disaster is not perforce photogenic. We could stress the point in the case of the bauxite-waste lake, that pollution is the exemplified case of toxic evidence, with photogenic properties. But the more I do work on that specific case, the more I have to disagree with this assertion.

To go further, I have to unpack many layers of this problematic term of toxic *photogeny*. First, what does waste, pollution or toxicity mean? What is pollution? What are the levels and boarders of toxicity? For whom, what and for how long? What could be the visual (photographic) evidence of toxic matter? Dead bodies? Smog...?

In the case of the bauxite-waste lake, one could say that the red colour scheme operates as a catalyst of *indexicality*² or representation, conveying the whole set of symbolic aggregates. The colour red in the history of painting embeds no less than the divinities holding power, mythical heroism, the law of the strongest, symbols of desire, life, death, demons, war and violence. Hence, one could easily argue that my picture could stand for the perfect allegory for ecological disaster and climate change. I will once more vote against.

In fact, the way of reducing a colour scheme to a state of harmful agency –even if useful for the communication department of the capitalist mediasphere—is a misleading shortcut. When we drop out the metaphoric to go to the real, chemists tell us that the colour red is generated by a concentration of *iron oxide* Fe_2O_3 naturally present in bauxite rock, a harmless chemical compound widespread in nature and often used as pigment (in cosmetics, painting, etc). In the case of the bauxite waste, the problematic substances are huge concentration of *sodium hydroxide NaOH* (also called caustic soda) combined with a cocktail of heavy metals such as lead, mercury, and chromium. They are barely invisible and the measuring of heavy metals is *per se* a challenge for untrained people outside of specialized labs.

I am stressing the register of facts in order to escape the realm of spectacular reappropriation by mass-media-infused communication, as a political call to consider complexity instead of unification, against abstract synthesis and universal projects of society as suggests Felix Guattari under the notion of *Ecosophy*³ in his essay *The Three ecologies*⁴. The role and the product of image making is for sure at stake in the alienating mass-media process; I have to find my way on the production of alternatives.

Another problem that I want to point to is representation. Asking myself if my picture could play the game/role of an ecological disaster allegory, I submitted it without caption or explanations to some friends and family members knowing nothing about my research. Here are some of the interpretations:

> "A seaside at low tide, red sun. No humans and no life, but the place does not seem particularly hostile."

"Probably in Africa. The place seems rather inhospitable, there seems to be sand and a great spread of blood which reminds a bloody sea turning red when whales are killed. This image depicts a certain amount of violence."

"Sunset on a beach in Africa, quiet time. Staring longer, the atmosphere seems more and more disturbing, but this landscape is not necessarily real or realistic, it could have been faked." "A quiet pool of blood recalling massacres of seals, but not really

disturbing cause the situation seems unreal. The atmosphere does not

look real, likely photoshopped."

"A ferrous ground, probable ore, iron dissolved in water. Looks like a cloaca, but looks either from a manipulated image, or is linked to a factory."

These various readings are pointing to the fact of cultural and subjective determinism. As I was supposing, the allegory is failing. Wondering about the effect and efficiency of pictures of the Anthropocene, I took some time to look at Edward Burtynsky's work, the so-called photographer of the Anthropocene. More than spectacular, his images of industrially altered landscapes are depicting a new Toxic Sublime according to Carol Diehl. In her words "This horrific example of environmental toxicity is somehow... beautiful to behold. That paradox can't be resolved The deft seduction of his art keeps us transfixed⁵." Hence, photography is a seductive witness, whose impact brings us closer to the sublime than in a real reflexive position. Moreover, his shots are mostly taken by plane, which allows him to fix the landscape-from above-on an equivalence plan (not far from a machinic/ satellite point of view) and to place himself in a heroic position. His point of view from above is thus exemplified in the way he talks about his work: "I'm looking at humans and what they're doing to the planet as if I were an alien6". This outsider position is a paradigm of modernism, a mastery of denial, de-responsability and dualist philosophy.

Even more striking, his political point of view seems to be in quite a double-bind: "[I'm] an advocate for sustainable development", he tells to the audience at *Photo London.* "For all its warts, I don't see anybody with a system that's better than capitalism. (...) I think to be an artist today, especially if you're doing photography and working globally, you have to see it as a kind of business⁷."

In my view, all these aspects are highly problematic. His impulse of a late Romanticism is combined with aggressive and globalising technology in the voice of power. Both his work and his artistic position are melting in the paradigms defined by Allan Sekula (1974), the *symbolist* and the *realist folk-myths*⁸.

Furthermore, his aerial near-abstractions are a perfect example of form taking over content (and context) and is sometimes presented as such⁹. It is one more way to vanish our political concerns. I do strongly agree with T.J. Demos that Burtynsky's tendencies to make antropogenic violence monumental are "(...) more about dramatizing in spectacular fashion the perverse beauty of a technological, and even geological, mastery devoid of environmental ethics¹⁰." This visual sublime tends not only to generalize and universalize responsability for environmental damage and species disruption. I quote Demos again: "Part of the alienation¹¹, in this case, is the perverse enjoyment the photographs afford of our own destruction.¹²"

According to Allan Sekula, "It is necessary to eradicate the aesthetic in its totality, so that a significant art emerges, whatever it is13." In his rich writings points to very important facts: The artists of the center-left documentary have turned violence and suffering into aesthetic objects. Which means compassion, not collective struggle. He highlights the relations between technology and alienation, and addresses a call against violence done both to the human body and the environment, in an active-political and symbolic-resistance against capitalism. In 1981, he attacked the alleged nature of the image as a universal language, furthermore self-sufficient, and warns against global shopping pictures. He adds that "The photograph remains comparatively a primitive medium. Photographers tend to naively believe in the power and effectiveness of the single image¹⁴." Deconstructing the modernist doxa and its pure photography, his analyses were pointing the value given to this medium as autonomous compared to other media, and its so-given ability to capitalise the entire visible world on an equivalence plan. His determination to understand how photography is used to legitimise and normalise existing power relations, and the way this media builds an economy of imagination forced me to be even more aware and critical about my own work. He also addresses his critiques to exhibitions in the *sterile* contemporary art space, out of context and fostering indetermination in the reading, arguing that the referential function collapses in the expressive function. Moreover, a permanent artistic self-promotion. Up to this point, I do agree with him but I am also wondering if a massive dissemination through social medias would be able to solve that point, and I'm not quite sure.

T.J Demos addresses the core of the problem of picture production in the frame of the Anthropocene: "For once we start talking about massively distributed and temporally extended hyperobjects of geology, to use a term of Timothy Morton, the minute-by-comparison pictorial conventions of landscape photography-even those photography at large-suddenly become far from adequate¹⁵." The whole representational regime is at stake if we take into consideration the fact that expanded imagery such as satellite imagery are the product of *military-state-corporate apparatus*, producing the same generalising discourse, and are often used to serve the Anthropocene retoric and its techno-bio-geo-engineering propaganda. Paul Virilio pushes the analyse even further, arguing that we are in a situation of megaloscopy¹⁶. The widening of the perceptual field goes hand in hand with instantaneity, real time dominates real space and thus participates in the Divine. Mega-Iomania has become a megaloscopy. Similar to Burtynky's alien from above position, "Anthropocene imagery tends to reinforce the techno-utopian position that we have indeed mastered nature, just as we've mastered its imaging-and in fact the two, the dual colonization of nature and representation, seem inextricably intertwined¹⁷." It is true that these pictures can help sensibilize people about the massive scale harms and some of the climate change effects, but they are also used in a set of contexts that are products of discourses that need to be analysed, understood and highlighted, as both Demos and Sekula request us to do.

Struggling for many months with all these considerations about both photography in general and my picture of the bauxite lake, wondering if it does make sense to show this image and if yes, then how? I have to take stock of it. First of all, the image is talking about its own limits: No equation for scale, time, politics, materials, species. Many political levels are missing, for instance politics of extraction, aluminium refining, pollution generated by this processes, the global ore transaction, and the local context. Moreover, the picture misses the ontological materiality of the politics of aluminium, the biological and geological consequences of the toxic sludge. The complex articulations of many agents need to be unpacked, and the importance of a plurality of modes of visibility and narration are at stake.

This lake is visually loud but epistemologically silent. Moreover, this lake is a crime and mystery. My position at this pointis that I am an artist as a listener and narrator, and this picture is a frightening thing taken on an agnostic position. The project is an inquiry; they are many mysteries there. It's an ecology of political silence. This picture is seen as a kind of aestheticization, but the role of aesthetics can be understood in other ways. Beauty is important because it drives attention, but image-making should also take responsibility for making something visible. Thus, the question of beauty is a way to implicate the spectator in the toxic nature of what I'm depicting (if we can talk about some forms of beauty of the toxic). The image is an entry point and a way of inquiry, and the beauty drives you in horror, and in the middle of a dilemma.

Hence, I am dealing with a certain amount of opacity: No work of any kind has been made about this bauxite lake, and few information seem to be available. Moreover, I feel a lack of knowledge in interpeting data or even finding them. It is said that art is good in searching the politics of invisibility. Is the red mud a kind of invisibility? Entended that it is not only a question of economy of attention, there are new kinds of violence, a combination of social, technical and material, artificial and toxic events that have to be understood

and explored. And what is my role and my relation to the certainty and uncertainty of the lake? The artistic uncertainty is a tool to keep the discourse open. Therefore, how to think an art that would not only be the realm of representation? And how do we get beyond representation? As pointed out by many scholars, including T.J. Demos in his essay *Anthropocene, Capitalocene, Gynocene: The many names of Resistance,* the term *Anthropocene* is a very problematic one: "Anthropocene is likely here to stay–despite, or even because of, its use-value in generalizing and thereby disavowing responsibility for Earth-system disruption, validating further geoengineering experiments, and diffusing political traction in the struggle against climate change¹⁹." Even worse, it allows *human mastery* to thrive, addressing through the threat of apocalyptic consequences the urge for technospheric salvation.

Hence, this designation does not capture the entanglement of human and machine, white male supremacism, anthropocentrism, slave labor, commodification of nature and corporate colonialism, complex socio-economic entanglement in the capital nexus of global neo-liberalism, and authoritarian homogenisation/standardization, monocultures and mass extinction, to mention only a slice of the pie.

Following Donna Haraway's suggestion to critically reflect on and to forgo *the solace in human exceptionalism*, a few other names have been proposed. In my concern to link and map the aluminium industry, pollution, ecocide and picture production, I suggest to add two more designations to the list that I could find out:

Anthropocene

(Paul Crutzen and Eugene Stoermer, 2000)

Gynocene

(The first usage appearing online is from the website Le forum TRANS -Rencontres transgenres - Transsexualité(s), 2010)²⁰

> **Capitalocene** (Jason W. Moore, 2014)²¹

(Jason W. Moore, 2014)-

Plantationocene (Donna Haraway, Anna Tsing, 2014)

> Chthulucene (Donna Haraway, 2015)

Homogenocene (Kieran Suckling, 2015)²²

Cyborgocene (Atomic Geography, 2015)²³

Necrocene (Justin McBrien, 2016)²⁴

> Modernocene (R. Mueller, 2017)

Technocene

(R. Mueller, 2017)

All of the alternative denominations to the term *Anthropocene* are stressing interesting points. The most compelling one in the context of my research is Jason W. Moore's *Capitalocene*, as defined in his essay *The Capitalocene Part I: On the Nature & Origins of Our Ecological Crisis:* "The alternative to the *Age of Man* (the *Anthropocene*) is the *Age of Capital* (the *Capitalocene*). In this, capitalism is understood as a world-ecology, joining the accumulation

of capital, the pursuit of power, and the co-production of nature in dialectical unity. (...) The *Anthropocene* makes for an easy story. Easy, because it does not challenge the naturalised inequalities, alienation, and violence inscribed in modernity's strategic relations of power and production. It is an easy story to tell because it does not ask us to think about these relationships at all. The mosaic of human activity in the web of life is reduced to an abstract humanity as a homogenous acting unit. Inequality, commodification, imperialism, patriarchy, and much more²⁵."

Even if the Capital and its cybernetic arrays are not easy to grasp, his definition urges us to address responsibilities-e.g. those of the World Bank, WTO, States (politics) and big companies, all embedded in and motors of the so-called modernist philosophy. But working for many years in the Romanian context, I can notice that the consequences of mass industrialisation processes are similar in both communist (and post-communist) and capitalist regimes. Gabrielle Hecht rightly points out this fact: "The Soviet vision offered a development path that led to socialism through (often large-scale) industrialisation. Apart from its rejection of the free market, however, the Soviet model of progress differed little from the Western one. Through their claims to modernity, both capitalism and communism proclaimed the power to provide rational means of explaining and transcending inequalities. In both cases, the very claim to rationality depended on an imperial objectification that lumped emerging nations together under the rubric of underdevelopment²⁶." Hence, both of them are at grounded in a modernist paradigm; it seems relevant to propose Modernocene as an alternative to Capitalocene, to deploy the scope on a less western-centered perspective.

The *Technocene* aims to refer to the term *technosphere*, the transformative power or agency of technology, seen here as multi-scalar system affecting and transforming both environment and theory. The *technosphere*²⁷, a term put forward by the geomorphologist Peter K. Haff, is the quasi-autonomous system of energy-metabolizing technologies that acts itself as a geological agent. The *technosphere* engendered the frame/scale/time of technopolitics, the tools that enable both economic dynamics and war politics. Hence, the term *Technocene* is intended to point to the military-economic race for technology, which involves and relinks—among other—extraction, refining, trash-making, engineering, tools, surveillance, control, mass consumption, and wars.

"Mining and metal consumption have not yet assumed the key place they deserve in climate change debates²⁸."

FELIX PADEL & SAMARENDRA DAS

Bauxite mining is a huge business bringing big profits. Exploring the aluminium industry both at local and global scale, I aim to highlight the ability of liberal strategies to turn human and ecological concerns into absurd cybernetic loops. The horror movie is real, unfolding in *slow violence*²⁹. In a perverse irony, this highly polluting commodity is offered to our good consciousness as a *green* metal, deserving liberal and green causes. Generous donations, national and international subsidies are providing the greenwashing flow. Unable to depict the geopolitical arrays through visual representation (in my case photographs), I have to narrate the complex picture of the aluminium industry's politics and thus, set up the context. Hence, what are the big companies doing to our earth and not-yet *kins*³⁰ through mining?

The first thing that I need to unpack is what is the nature of bauxite/red mud-waste. Bauxite is the chief ore of aluminium. Aluminium metal is so chemically reactive that native specimens are rare and limited to extreme reducing environments. Instead, it is found combined in many different minerals, in the very complex crystalline structure of bauxite rock. Bauxite does not have a specific composition. It is a mixture of hydrous aluminium oxides, aluminium hydroxides, clay minerals, and insoluble materials such as quartz, hematite, magnetite, siderite, and goethite. The aluminium minerals in bauxite can include: *gibbsite Al(OH)*₃, *boehmite AlO(OH)*, and *diaspore, AlO(OH)*³¹.

Aluminium is the most present metal on Earth; it composes 8% of the Earth crust. However, the quantity of aluminium in the rock is variable. The profitable bauxite ores for the industry (and for life support) are not so frequent and are mostly located in a wet tropical or subtropical climate. Thanks to its physical properties and its particularly complex geology, this rock is one of the most fertile grounds for the flora, which feeds the richest biotopes. Bauxite deposits seem to play a key role in promoting some of the world's most outstanding fertility. Pelikan, Cloos and Hauschka, quoted by Padel and Das, give us an interesting inside of the phenomena: "Aluminium is an essential element in this soil-rooted chain of life, holding moisture and channelling it, along with mineral trace elements, into the root-stems of plants: 'It conveys to the soil the properties of plasticity and water absorption; the ability to unite with the living substance that is water.' This is why as a metal, aluminium alloys easily with other metals. 'It is a gateway through which polarities are equalised in every way, be it those of heat and cold, of electricity, or of the metallic condition, standing as it does between the polarities of calcium and silica in the mineral world, or as amphoteric³² element (in hydroxide) between acid and alkali in the chemical world³²". The bauxite extraction is mostly strip-mined/dug out, open-cast, which leads to soil depletion and drought.

The industrial process to obtain aluminium is a complex one. An enormous energy is needed to break aluminium's multiple chemical boundings with the other agglomerated elements. The first stage is refining. The native *aluminium hydroxide* $Al(OH)_3$ (also called gibbsite or alumina) present in the bauxite rock is converted to the aluminium oxide Al_2O_3 by the *Bayer pro*cess (named after its inventor (1905)): Rock is backed at hight temperature and crushed in a rod mill. Caustic soda (sodium hydroxide NaOH) is added to lower the melting temperature. The resulting *alumina trihydrate* is then calcined to produce *alumina* (*aluminium oxide*), yet filtered and decanted to separate the *alumina* from the *red mud*. The whole process is very demanding in energy and produces copious emissions of carbon and other gases. The worst pollutant is the so-called *red mud*, which is dumped in artificial lakes or ponds next to the factory, and sometimes even released into rivers or seas (cf *Alteo*'s refinery in Gardanne, France). The *red mud* is highly alkaline and contains important concentrations of heavy metals such as lead, mercury, chromium, sometimes arsenic, and radionuclides that easily attach to these components.

The second stage is the smelting process via electrolysis, an operation demanding a huge input of electricity. Alumine is thereby melted into aluminium. Smelters emit large amounts of greenhouse gases among worsts (*carbon monoxide* and *dioxide*, *CFC* (+ *tetrafluoromethane*), *fluorine*), but modern smelters contain filters able to lower certain types of emissions. *PCBs* and other toxic chemicals are released into water sources without adequate treatment. The last stage is production (alloys, objects and so on).

[#2_004] COMMUNIST CAPITALISM AND GLOBALIZATION

"What is most important is that we love what we do. We think that when you are really passionate about what you do, you become useful to your community. It's when you create real value, for your clients, for your employees, and investors³⁶."

WІМЕТСО

To understand who is in charge of the bauxite-red lake in Tulcea–that is to say 50ha wasteland of environmental bio-hazard–I'm taking a while to criss-cross the net of actors involved in the topic.

The refining factory and its adjoining pond were set up in Tulcea in 1973, a time of big scale industrialisation process by the communist regime. Boarding Ukraine and the Danube Delta, this region was full of nice forests and swamps but was not a protected biosphere at that time. Following the plan of quantitative yield per capita, the State found a way to twist people's traditional fishery and agriculture practices into industrial labor, taking advantages of the geographical properties of the location: proximity to the Black Sea, easy transport of raw material by boat via the Danube, and presence of important natural water supply, so useful for aluminium production. Hence, around 2000-3000 local people were involved in the brand new factory called *Alum Tulcea*, which was the bauxite refiner for other aluminium State smelters such as *ALRO*, located in Slatina. Little information about this refinery during the communist period is publicly available. Hence I can't tell much more about the production conditions and further political operations.

Following the Romanian Revolution of 1989, the State collapse led to the bankruptcy of many factories and enterprises, leading to chaos and unemployment, but people were hoping for a better future. However, aluminium production seemed to survive the turmoil somehow; the conditions of aluminium production have been maintained. In the course of the post-soviet turbulences, a privatisation fashion took over the most lucrative businesses of the country, in which both internal and external actors were *sharking* their piece of cake.

In the framework of this specific case study, we can talk about a Russian takeover. In 2001, Marco International37, owned by two Russian oligarchs, Vitaliy Machitski and Alexander Krasner³⁸, operated the privatisation of Alro in a set of controversial transactions, bypassing the rights of the Romanian State and, thus establishing a Russian monopoly of both Romanian aluminium and energy trading. A report from the anticorruption organization OCCRP39 gives us a compelling insight into one slice of the operation: "According to court documents, Machitski and Krasner codenamed their Alro takeover The Vostok Project⁴⁰(1999). The strategic objective of the Vostok Plan was defined as the creation of a vertically integrated operation that would give the men power over everything from a plant producing raw materials (SC Alum SA, which Machitski's enterprises acquired), to a power plant, to a plant producing primary products (Alro) to a plant for manufacturing products out of the primary products (Alprom of Romania). The plan also detailed the participants and their strategy including lobbying people in positions of political influence, the head of consulting banks and the state privatization agency. (...) The Romanians were concerned that Machitsky had not only acquired ownership in the country's aluminum industry but apparently controlled a substantial percentage of Romania's gas imports from Russia⁴¹."

Around 2007, a furious struggle breaks out to take over *Alum Tulcea*, a main alloy for the vertical production strategy. In the aftermath, *Marco* is renamed *Wimetco* (Vitaliy Machitski as Founder and Chairman), siting its headquarters in Amsterdam and its management quarters in Zurich. *Wimetco*'s shareholder is *Vi Holding Group* (Vitaliy Machitski as Founder and President). Massive investments are made in China to expand the metallurgy business; a Russian-Chinese axis seems to be *vital* for their multinational goals.

Up until 2007, both *Alum Tulcea* and *ALRO Slatina* are under refurbishment. They aim to replace some existing equipment to streamline production with the European standards for environmental protection and optimise the infrastructures for more competitive production costs. Over the past ten years, *ALRO* has invested about \$ 100 million in projects with direct and indirect impact on environmental protection. According to Gheorghe Dobra, *Wimetco*'s Chief Executive Officer, "The company implements eco-efficiency and safety measures throughout the entire production process and meets customer requirements in this field. It is also involved in activities related to global environmental issues through active cooperation with international organisations on the issue of reducing greenhouse gas emissions⁴²."

This green trend, which should be verified in the field, seems to have its shadows. *Wimetco* is the greatest consumer of electricity in the country and until 2012 enjoyed direct power sale contracts at prices below those in the market with *Hidroelectrica*, the State's electricity provider⁴³. The company seems to struggle since 2014 with increasing EU ecotaxes⁴⁴, probably renegotiated with the State. Although it is a private company, *Alro* has always benefited from political support at the highest level. *Clean* on one side, bypassing ecotaxes one other?

A last interesting point to be mentionned. *Wimetco* extracts aluminium from bauxite rock mined in Sierra Leone (Gondama and Porto-Loko), one of the poorest country in the World⁴⁵, well known, however, for the richness of its geology (diamond, iron, gold, titanium and bauxite deposits). The company bought *Sieromco*, a subsidiary of *Alusuisse*, and mining operations formally started in 2005. The company promises to build infrastructures (schools, medical centers) for the local community and—according to the company's advertising video—to plant cashew trees (!) in order to restore the mined/ruined biotope. As we know, the reality gap between the company's fine words, engagements and a situation where corruption, hierarchy and profit are the norm.

In my attempt to map the globalizing tentacles that are shaping the *Modernocene*, it is not merely anecdocal to mention that the mines in Sierra Leone are under the rule of privatisation and market deregulation processes (free market) of the third world, implying the World Bank, corrupted State politicians and investors, significantly since the end of the civil war in 2002. Also relavant is the fact that *Alum Tulcea/ALRO/Wimetco* has invested in a diamond mine in 2011, located close to one of its bauxite mines. Moreover, the company seems to be expanding its extraction field (bauxite) to Ghana (since 2007) and is prospecting in Vietnam and Indonesia.

"Splitting molecules of aluminium oxide was an invention with extraodinary consequences⁴⁷."

F. PADEL, S. DAS

Aluminium is a pure product of the Industrial Revolution and one of the newest metal to be discovered by humans. Its unprecedented use and involvement in the development of technologies makes it a primary agent of modernism. The aluminium industry is reshaping geography in an unprecedented way. Since refining, smelting and production processes are extremely energy intensive, a whole set of infrastructures is redesigning landscapes, local and global histories. The genealogy of hydroelectric power and thus the diversion of rivers and the construction of dams is initially linked to the development of the aluminium industry. It is a fact of which we speak little but powerful lobbies are working hand in hand, with little regard for the drying up of rivers and other environmental damages implying, of course, social struggles. The Chinese aluminium industry is fed by more than 90% by coal power stations, one of the worst CO₂ emitters. Nuclear power plants are of course involved in the loop in many locations, and cheap oil and natural gas also benefit the Middle East's aluminium businesses. On this first level of pollution generation, let's add the refining and smelting complexes. As already explained, both processes release significant amounts of chemicals both in air and water. At the end of the chain, we have to keep in mind wastelands, red mud lakes and other trashes. Hence, if we sum up, mining and refining processes are dominant toxic catalysts, can be counted as on one of the biggest greenhouse gas emitters, and also release chemicals, heavy metals, dust pollution. The glibness with which aluminium can be called a 'green metal' is simply mindblowing.

The age of aluminium is reshaping the social as well. Local populations are often displaced by bauxite mining, which implies deforestation and thus the damage of their natural resources, its life-giving fertility. Around factories, people are struggling with pollution and 'modernization' processes which go against their traditional lifestyle (especially in India). Cultural genocide and ecocide are facing the same predator.

Business strategies, cartels, costs and benefits

Wimteco's vertically integrated system, in which a top holding company controls via interlocking companies the whole production system, is a clever way to make huge profits, probably empowered thanks to a process called *Transfer pricing*⁴⁸.

Mapping the patches of the Wimetco ecosystem makes me aware of the complex structures of economics, where ownership of trading companies is hidden behind paper companies set up in exotic tax heavens, and murky business is set up at the edge of the law. Hence, it is not an easy thing to grasp who is behind all of these operations on a global scale. According to Padel and Das, we are facing highly secretive cartels, "(...) mining companies act as if they were discrete entities but, in fact, work hand-in-glove with political, financial and legal entities. (...) Beneath the rivalry, aluminium companies work closely together. (...) Aluminium plays an unseen hand in recession, through the insanity of commodity-trading future options, inflating the bubble of unreal money. (...) In fact, a mystic has grown up of making pricing policy highly secret and hard to understand-a trend that has increased hugely in recent years⁴⁹." The primary aim of the aluminium cartel is to keep prices of bauxite as low as possible, and the war/arms industry needs cheap alumine and aluminium. The demand for new primary metal continues to grow at an average of about 10 per cent per year (Padel & Das, 2010). According to the International Aluminium Institute, global production of aluminium from January 1973 to March 2017 represent 1'148'633 thousand metric tonnes of aluminium (9,913 thousand metric tonnes of aluminium for one single month)⁵⁰. It exceedes that of any other metal except iron.

What is the real cost we are making our planet pay? According to Padel & Das, "Measuring prosperity in purely economic terms brings in a great distortion⁵¹." It seems obvious that indexing a price for a commodity per se–and even more when highly processed–doesn't account the cost of displaced population, health problems, removal of forest cover, long term pollution, detoxification processes. "Human and environmental costs are regarded as *externalities*, not calculated as a part of the equation⁵²." Furthermore, there is a real urge and need to understand bauxite's place as a whole bio-chemico-social ecosystem.

Aluminium wars

"Give me 30 thousand tonnes of aluminium, and I will win the war⁵³." Joseph Stalin to Franklin Roosevelt (1941)

The age of aluminium carried us many wonders and nightmares. According to Padel and Das, "Our war technology is based on an alchemy of combining metals, and aluminium is at the centre of this alchemy, thanks to its combinability with other elements and its properties as a conductor. This puts aluminium right at the centre of the world economy, with oil⁵⁴."

Writer and scholar Ronald W. Graham estimated in 1982 that more than 30 percent of aluminium outputs has always gone to the weapons industry⁵⁵. Indeed, aluminium is a vital component for manufacturing *strategic* military hardware (aerospace, radar, satellites, and related *star wars* programmes). Moreover, its particular chemistry makes it a powerful explosive, under conditions of high temperature and alloy with metallic oxides. As example, we can mention one of the most destructive and widespread *conventional* bombs called the *Daisy Cutter (BLU-82)*⁵⁶, a blasting agent using a mixture of ammonium nitrate, aluminium powder, and water, hence a *necropolitical* agent used both for the Vietnam war and more recently in Afghanistan. We could also mention the *Thermite Process*⁵⁸, whose aluminium explosive properties enables mass bombing since WWII, nuclear missiles and many others. I will not neglect to note that Swiss companies exported war materiel valued at \$444.3 million to 71 countries in 2015⁵⁹.

Our dependency

The bad news is that it would be very difficult to boycott aluminium. Just as companies have colonised many places for extraction and refining, aluminium has colonised our daily life and domestic consumption. During a lifetime of 70 years, a European consumes 1.6 tons of aluminium. To make the long list short, a few standard applications:

- Aluminium is embedded in electric and electronic devices as a conductor (fundamental component in the electric-tronic cables).
- It is a major alloy thanks to its combining properties and can be combined both with other metals and non-metals.
- In automotive and aircraft industry, pure aluminium and composites are key strategies for reducing weight and therefore oil consumption.
- The genius and unrecyclable *Tetra Pak* high-tech invention (compound fusion of aluminium and plastic) contains our fruit juices, soy milk and Italian passata.
- Aluminium is added in water supplies for clarifying purpose.
- It shapes our favourite tools and gadgets: computers, mobile phones, Coca-Cola cans, etc, and on a bigger scale: buildings.
- Specialty aluminas⁶⁰ are used in the manufacture of special glasses (LCD screens, smartphones screens, etc.).
- Aluminium salt is a main additive in some drugs and vaccines despite its probable neurotoxic effects/consequences.
- In the agri-food industry, aluminium is sometimes used as a food preservative or as a colouring agent⁶¹. All additives containing aluminium are represented by the following abbreviations: E173⁶², E520, 521, 522, 523, E541, E553, E554, E555⁶³.



1.

Sierra Leone postage stamp shows Mickey Mouse mining bauxite; Circa 1990

2.

Romanian postage stamp shows Mickey Mouse in the band; 1986

KEY MOMENT #3 SECOND MISSION ON THE BAUXITE-WASTE LAKE

July 2016. Back on the field for seven days, I'm aiming to collect information from both human and non-human witnesses. Further explorations and new knowledges allow me to map the infrastructures, connecting *Wimetco/Alum Tulcea*'s factory with its red mud pond—located seven kilometres ahead next to a village called Mineri—and its hidden ramifications. The excavation of new evidence, both narrative and material, are providing my research with valuable insights and are essential elements that allow me to unfold the hidden perspectives of the bauxite-waste lake.

My methods to operate are the followings:

1- To explore and map the specific geography, conditions and modes of contamination;

2– To collect geological, chemical and biological samples of the bauxite-waste (dust, mud, water), soil samples from the fields around and dust samples from the refining factory;

3- To gather evidence from local people and scientists;

4— To record new events with my technical apparatus. In addition to my usual tool (my camera), I am using a subaquatic or fishing camera to dig into the core of the matter, thus decentering my human point of view in a more random way of recording, with a device that does not allow me to control both the framing and the trajectory.

I don't have space here to narrate in detail the mission, but I can point out briefly some striking aspects. First of all, I can feel a loud discrepancy between the strong phenomenology of the place and my resulting pictures. In the real realm, the smell is very present, both sharp and 'sweet'. The wind is carrying the very volatile red dust from a red mud lake that has severely dried since two years, in a close to a tornado experience. A combination of fear and fascination is omnipresent; it is hard to know what kind of encounter our illegal presence on the site could generate. Moreover, the uncertainty that is laying in the potential intoxication or contamination opens an epistemic panic field. The caustic properties are both present and phantasmatic, and many mysteries are still laying there. The following narratives are telling a part of the story in a compelling way.

Excerpts from the conversation with a Romanian scientist:

"In the seventies, this factory was about 2000-3000 workers. Now it is assuring about 1000 working places, and therefore the local authorities are closing their eyes for environmental problems. On *Wimetco's* website, there is no local certification from Tulcea; they have it from Galati. I think that the local guys from Tulcea didn't accept it, but they went further and obtained it from a headquarter so that nobody will stop them. (...)

They are two pipelines, one going from the factory to the waste lake with a semi-solid waste. The other one is only conveying the liquid substrate to a natural lake, that joins the Danube. This exit pipe is easy to localise on Google Earth, because the water is not black as usual on a satellite image but white, due to the release of sodium hydroxide, I think. When they release a big amount of this waste, one can find a lot of seagulls eating the dead fishes. (...)

I try to investigate since many years because some strange death happened. Nobody has made a study about the danger of the dust. At my workingplace, I think we can't do it. We can't interfere with these local sharks, let's say. There is waste for sure, but it doesn't kill people immediately. (...)

When I was living in the area some years ago, I was also farming bees, and I had to change their water twice a week because of the red dust. But from one day to another, the whole colony collapsed. The honey that I was producing was a little bit pink with a special taste; it was something...interesting. (...)

Since a drunk guy dropped into the lake in 2006 and died because of the caustic soda, the company put a fence at some places, but not everywhere.





1. Pipeline °1 . July 2016 2. Bauxite dust from*Wimetco/ Alum Tulcea*'s refining plant, July 2016 3.

Short fire at *Wimetco/Alum Tulcea*'s refining plant, July 2016 There is also security staff; guards are coming if you are staying there for more than 10 minutes. (...)

Five years ago I saw a Japanese company on the bauxite-waste lake, that came to recover some rare metals, maybe cadmium or zirconium, and thus set up a recovery station. They have analysed if it would be economically interesting to do so and seem to have begun the recovery. (...)

For the analysing of the samples, I would trust more a lab from your country than from mine, not because they don't do the procedure, but sometimes they do, let's say... favor someone else interests. What could be done in this area is to have an overview of the history of people's health problems. Nothing has been done till now. And people from Mineri are not aware of the chain of consequences when they feed their garden with the contaminated water. (...)

In 2010, there was an agreement to close and clean everything from there. But his never happened. By the way, this waste is too toxic to be remediated with plants."

Excerpts from the conversation with people from Mineri.

Woman 1: "You can not stay with the windows open because it smells very strong, especially when the wind blows from the shlam⁶⁴. (...) Three pipes are carrying the shlam from the factory. It is known that these pipes have cracked several times, what led the substance flow into nature; we even saw dead fishes in the water of the Delta. About thirty ou forty years ago, the pipelines were wrapped with sheets and glass wadding, but people in precariousness stole these materials for their use. Until the Revolution there were regular checks, we saw members of the staff walking on the pipelines to make sure of their resistance, but since that time we no longer see anyone doing so. (...)

We have abandoned the use of water wells⁶⁵ about fifteen years ago because of the high concentration of soda⁶⁶. After years of protests that came out on local television, the mayor finally made the necessary arrangements to bring clean water from Tulcea. (...) All the social strata are represented in Mineri's population, but no one is doing anything to change the situation. We got used to the idea that no one will do anything to improve this situation."

Women 2 and 3: "This shlam is our misfortune; it has destroyed our lives. If we fix our laundry, it becomes red, and we must clean the clothes a second time. We can not take our kids out because we get attacked by the soda, especially when it is windy, the dust deposits everywhere, even on the bottle of the baby. It burns our nose, our eyes and itches our throat... When it is too dusty, we even have to shut in the animals. It is a dangerous place, we would like to leave, but to go where and with what means?

When we were using our well, we were taking out red water. Then, we were using water from the swamp that is at the bottom of the village, trouble and not very drinkable, but we had no choice. Now we drink chlorine provided by the city. (...) We can't even make children anymore because there is soda falling on them..."



1. Exit of the second pipleline into a natural lake 2. General view of the bauxite-waste lake and its surrounding

3.

Wimetco /Alum Tulcea's bauxite-waste landfill (Lacul Rezidual de Bauxita Mineri)





KEY MOMENT #4 ONTOLOGICAL SHIFTS

[#4_001] REFINING A HOLISITC METHODOLOGY Jean-Luc Godard once said that "with the microscope, one can see the infinitely small, with the telescope, the infinitely big, and with the camcorder, the infinitely medium." Both cinema and photography have been calibrated from a human standard, the size of the human body. In the far too anthropocentric era of the *Anthropocene/Modernocene*, there is a political urgency to liberate our gaze from both human scale and ocular-centric traditions; I would say even more, to process a shift in considering the point of view of non-human agencies. Hence, my way to engage a turn of perspective and to avoid the single pictorial/indexical regime has significant consequences for my methods as an artist-researcher. Stepping out of my comfort zone, I have to work with new concepts and new tools. Then, how do I know what to see? And what remains unseen? Therefore, I have to understand the hidden volumes of the Bauxite lake and to navigate complexity.

Hence, my practice aims to navigate beyond the surface of the image, to dig into it and to unfold the hidden perspectives beyond, or within, the spectacular picture, which means not only multi-layers and multi-scales but also multi-points of views/access in a rhizomatic methodology. Not just one frame but a multi-storage architecture, sediments, *strata*, sections (as in geology) interacting with each other, because we have to understand the hidden volume of the bauxite lake. My practice maps different aspects of the topic for a more holistic view, as a tool for shaping transdisciplinary projects, to understand different faces of one particular site.

The focus can thus unfold the different levels that lie in the shadow of photographic flatness and spectacularity, the social-political *strata*, the biological *strata*, the geological *strata* and the technological one. To take a position opposing the uniqueness of the photographic framing and to decenter the human vision, I try to develop and articulate a multiscalar regime of points of views from different agents: The point of view of the bauxite rock, of the bauxite lake, of aluminium, of the aluminium industry, of the market, of the resistant species and of the invisible data.



[#4_002] AGENCIES, CONTINUUM AND ENTANGLEMENTS

"By cutting the term spirit from its very palpable earthly prominence as the wind, alphabetic civilisation transformed the mystery that was once simply invisible, into an otherness that was completely intangible, incapable of being felt by any of the bodily senses. By thus pushing the spirit out of the sensuous sphere, civilisation divested the material world of its enigmatic depths, of its distances and its concealments. Rid of its constitutive strangeness voided of its obscurities, the perceivable world can now be constructed as a pure presence, without any absence, as a pure object capable of being seen, at least in principle, all at once. Capable of being known, at least in principle, in its entirety, with no ambiguities or uncertainties. And we, the knowers, now hover apart from the palpable world, surveying this ground object, with the impartial gaze of a pure mind or subject without physical attributes or constraints⁶⁷."

DAVID ABRAM

Some scholars, including Jane Benett, Donna Haraway, Anna Tsing and other *new materialists*, are working to understand the points of view of nonhuman agents and include them in thinking contemporary urgencies. This shifting perspective is a powerful political strategy aimed at decentering the human gaze, and breaking down the *onto-theological* binaries of life versus matter, human versus animal, will versus determination and organic versus inorganic, since these binary antagonisms are feeding human earth-destroying fantasies of conquest and consumption. The desanthropocentering process (of both look and intentionality) allows a holistic awareness of what relies upon causes and effects. Thus, the call to operate continuums (non-binarity) or assemblages with a non-human perspective is a compelling strategy to decolonize modernism from our mindset.

The visual/representational regime is clearly inadequate for depicting the depth of the invisible mystery and the dynamic materiality of *things*. How, then, to narrate or figure out the multiple non-human agencies?

An attractive entry point could be to look at Indigenous knowledges, understandings and beliefs. As some of us may know, many Indigenous poeples hold minerals to be sacred. According to Kenneth Meadows, "In the native American view, (...) rocks and montains are the earth's skeleton, and minerals are her brain cells. (...) To native Americans, rocks and minerals speak and teach poeple⁶⁸."

In such cosmologies, minerals represent the hidden forces that are *latent* in nature. Consequently, the act of mining is, first of all, a major sacrilege, and the new essence of processed material is releasing the destructive power of spirits. For Padel and Das, "If removing [bauxite] creates certain kinds of imbalance, the splitting of aluminium molecules achieved in smelters creates another, ushering in a whole new age of material benefits, at the cost of unleashing new dimensions of material instability into the world. Aluminium has strong powers for death as well as life⁶⁹." For instance, one can say that rock expresses a kind of *deviant vitalism* when it is out of balance—as we can notice in the upset heavy metals cocktail agglomerated in mineral waste such as red mud.

Hence, for Indigenous people, nature is not just matter, it is also spirit. Conversely, Modernism has achieved a process of disenchanting, de-spiriting and desacralizing both nature and matter, which enables extraction and destruction for profit motives.

For Jane Benett, objects or nonhumans seem to be inert because they do exist, act and live beyond the threshold of our perception. To detach materiality from the figure of passive, mechanistic, or divinely infused substance, she highlights the *vitality* in the material agency of nonhuman things. Agents or *actants*⁷⁰ comprise an interstitial field of non-personal, ahuman forces, flows, tendencies, and trajectories; they are *sentient*⁷¹ entities. To paint a positive ontology of vibrant matter, Bennett underlines that

"The project, then, is to theorize a kind of geoaffect of material vitality, a theory born of a methodological commitment to avoid anthropocentrism and biocentrism- or perhaps it is more accurate to say that is born of an irrationnal love of matter⁷³." Thus, vibrant matter/non-human agents operate at a micro/macro-level of scale and awareness. To give voice to what I think is a shimmering, potentially violent vitality intrinsic to matter, we need to amplify thresholds, accelerate speed, collide some events or encounters. According to Bennett, "There is also a public value in following the scent of a nonhuman, thingly power, the material agency of natural bodies and technological artifacts⁷⁴."

If I try to change the perspective/ontology of both aluminium and red mud and consider them as a vibrant material, what methods could be appropriate for the task of speaking a world for vibrant matter? How to acknowledge the obscure but ubiquitous intensity of impersonal affect in the particular case of a geochemical agency such as aluminium and bauxite-waste?

More useful concepts: Through her work, Anna Tsing sketches open-ended assemblages of entangled ways of life (what she calls *patches*), "as these coalesce in coordination across many kinds of temporal rhythms and spatial arcs⁷⁵." Doing so, she aims to look more closely at cross-species interactions, juxtapositions and disturbance histories rather than accept or reproduce the capitalist myths of progress.

Starting from notions implicit in media theories, John Durham Peters argues that "media are more than carriers of messages: they are the very infrastructures combining nature and culture that allow human life to thrive. (...) Earth, light, air and time are medias⁷⁶."

Jussi Parikka goes further: "Media materialism (...) has come to refer to technology as an active agent in the ontological and epistemoligical sense. (...) Geology becomes a way to investigate materiality of the technological material world⁷⁷." With the term *medianature*, he proposes a variation of Haraway's concept of *natureculture*⁷⁸, with a particular emphasis on technical media culture. For Parikka, *medianature* crystallises the inherently interconnected nature of natural ecology and the technological media, in a continuum that entangles minerals, metals, chemical components, micro-organisms, labourers and high-tech devices. Hence, our technological gadgets are made of geological compounds extracted and assembled by underpaid labourers in mines and high-tech factories, and finally become new kinds of fossils once out of use and trashed. One could thus speak bout a kind of *technometabolism*, intended what consumes energy, produces waste, transforms materials but also uses and creates information.

One of the strengths of this concept is that it brings together impossible times, scales, things, powers and make them live together. The notion of medianature is colliding deep time, present time, future time: We are taking stuff out of the deep time or geologic past, and we are releasing it into geological future (water, soil or atmosphere) through refining, combustion or other operations. Bauxite-waste or red mud is then a hybrid time made of the combination of the deep time of the rock with the present time of industrial processes, which has consequences for the future time because of the resulting polluted ecosystem. Moreover, my case study is a paradigmatic double bind that allows a self-reflexivity of the media: My camera, made with aluminium and rare earth, is the tool I use to document and witness the ecological disaster led by the industry which nevertheless makes my documentaion possible.

As aluminium is contaminating—or let's say colonising the world—for more than a century now, it is time to highlight the continuum of *aluminic* entanglements with some examples:

Native aluminium hydroxide, through three molecular splitting/recombination (that are alienating processes) translocates and reveals its latent power in the nervous systems and brains of vaccinated humans. It also delivers its vibrant energy in the form of nanoparticles released into the atmosphere by nuclear missiles, or becomes a fossilized aluminium *aggregate-post-beer-can-trash* dropped on a beach.

In the lens of the *medianature* perspective, on can say that aluminium molecules are embedded—by cause of (polluting) transmutations operated by underpaid human agents—into the recording and computational devices that allow me to document the harm and to write these words. Thanks to planned obsolescence, my high-tech fetishes will then land on a Chinese or African landfill to be dismantled and refined again and recombined, entering into other lives, loops, patches.

On the shores of the bauxite-lake in Tulcea, the *desalumined* red mud waste (or *post-bauxite Sierra Leonean rock*) spreads its volatile pink particles into the lungs and cells of the local population or is collected—mixed with pollen—by the surviving bees for the production of an awkward pink honey. In the meantime, the alkaline agent *NaOH*, as a by-product of the bauxite refining process, infiltrates soils and underground water resources, erodes the open-ended assemblages of species but neutralises for a while the concentration of heavy metals in the red mud.

And last but not least, the inestimable value of the deep time bauxite rock is commodified into volatile nano-second shares in *High-Frequency Trading*. As Anna Tsing asserts, "we are mixed up in the projects that do us the most harm⁷⁹."

[#4_003] TOXIC AGENTS AS MATERIAL WITNESSES

"Things have agency and matter is capable of narrating its histories if we realign the modes by which we, humans, attends to its particular forms of expression⁸⁰."

SUSAN SCHUPPLI

The objectivity and efficiency of an image to testify for a malfeasant event or the theatre of a crime pose questions that have not been answered definitively. On top of that, a photograph made by an artist will always be read through the lens of aestheticization, both subjective and poetic, which is not a compelling way to ground a piece of evidence for a lawsuit. It goes without saying that denying evidence is a condition for violence to take place. The task of a forensic artistic research is to gather, assemble and organise the articulation of speculations and evidence, to operate immediate politics in the reconstruction of the process linking the causes and the effects, rather than working on a single representative picture; which means to think about the totality of the event without using a predeterminate voice or media. As we live in a systemic field of violence, we have to find out and consider the multiple responsibilities that are relying on the dispersion of realities, layers of actors, inter governmentalities. Doing so, Godofreido Pereira defined a specific mode of inquiry named geoforensics, that aims to connect different practices and modes of analysis to "investigate human rights claims and environmental disputes as part of an entangled condition⁸¹."

Susan Schuppli asserts that within the *Anthropocene* era, climate change and mass toxification have inaugurated "a new set of lethal agents that push at the limit of what constitutes moral responsibility and thus legal liability⁸²." Her compelling approach aims to give a voice to the material agents that constitute a crime or a harm, considering them as non-human witnesses, while pointing out the complex field of responsibilities. Within a legal framework, a material witness is a person who presents information that can impact the outcome of a trial. Taking the material itself as witness, Schuppli operates an ontological shift and proposes a model of non-human agency that can work as a set of aesthetic and political operations.

Through deformations or transmutations, materials record and testify —in the core of their material structure—the reality of the violence they have undergone. She asserts that "it is not enough to understand these transformations purely in terms of their radical geobiological reorganisation, we must also confront their violence as fundamentally imagistic⁸³." Considering matter as a form of media, she underlines that "all matter that has undergone a transformation of some kind acts as a sensor that can record its contact and interaction with external agent and forces⁸⁴." Therefore, she assigns a new status to the image as not merely a fixed representation or inert index, but as "a productive agent in generating new knowledge⁸⁵."

She highlights a particular form of material witness that has image-making capacities, with *geo-photographic properties*; she calls them *extreme images*, *slick images* or *dirty pictures*. Through these notions, she means material "that can produce spontaneous or natural images by virtue of its inherently optical architecture, filmic morphology, and energetic dispositions⁸⁶." Taking as example the *Deepwater Horizon* catastrophe⁸⁷, she demonstrates the ontological capacity of oil to generate its own image, thanks to its natural photonic properties (hydrocarbon atoms + wavelengths of light) interacting with the moving and energetic surface molecules of the water, "recombining to produce an iridescent image of horror⁸⁸."

However, not all materials have the chemico-physical properties to generate themself as *geo-photo-graphic dirty pictures*. In a broader sense, a material witness is a dual/hybrid concept that articulates 1) the way that events are recorded in material records, and 2) the modes of image capture (devices, machines), systems, protocols and infrastructures, that record and archive the multiple encounters of events. Since some materials are lying beyond the threshold of visibility, the notion of scale becomes crucial. Hence, the way to activate politics in an articulation of scales and the





1. Alkalinophile microorganisms in red mud water sample 2. Radioactivity measure on bauxite-waste sample with a Safecast device translation of invisible realities need some specific tools with a technical insight and a scientific knowledge. Considering the inherent potential of non-human testimony, I am investigating how the non-human agents of the bauxite-waste lake are generating their own archives. And moreover, what kind of ontological *extreme image* does this lake produce?

If I follow Susan Schuppli's reflexions, red mud or bauxite-waste can be considered as "a *complicitous* material that registers the deeply implicated and distributed dynamics of events⁸⁹" such as industrially refined substances released in a landfill, that spreads its sum of hazardous molecules via dust and soil infiltration. I now work with the assumption that the cocktail of sodium hydroxide + heavy metals + possible radioactivity as a set of lethal agent that pushes the limits of ethical and corporate responsibility to legal accountability. Nevertheless, this has to be first (scientifically?) proven, and if that can be done, there are, unfortunately, no EU directives on soil pollution, therefore no regulatory thresholds (which seems to be, by the way, a kind of 'omerta' relying on economic interests)⁹⁰.

If we have to analyse the conditions for the genesis of the world of toxic matter and inscribe new forms and levels of evidence on the geopolitics of mining and refining, what are the elements/materials to take into account? What are the data of toxic material? And what are the boarders of toxicity? What is the agency of this toxic matter? And what is the image-capacity of bauxite waste?

Thanks to its high aesthetic properties, the bauxite-waste lake seems to be a perfect case of material witness evidence. However, the loudly visible element-the red ferrous oxide-is not the real harmful/toxic one, a fact that would seem to be a kind trick played on our hypothesis. Without a contextual insight, its bloody colour might just as well be generated by other organisms, such as the Dunaliella algae or a family of bacteria called Halobacteriaceae, as happened to the Lake Urmia in Iran, who turned bloodred in July 2016 thanks to the metamorphosis of both algae and bacterias due to particular environmental conditions⁹¹. One can then assume that the ferrous oxide is the element that makes the lake aesthetic. The ones that bring the red mud toxic are mostly invisible: sodium hydroxide, heavy metals (lead, mercury, chromium and more), and possible radionuclides. We are here in a case of a mineral-metallic pollution whose molecular properties does not seem to act as geo-photographic, except if we consider the soluble combination of water and sodium hydroxide as a kind of lens. I would argue that this element is not strong enough to be considered as a determinant factor of a particular ontologic image-making capacity in the sense of the iridescent composition of oil or the crystalline structure of snowflakes as pointed out by Susan Schuppli. To conclude, I would argue up to this point that the bauxite-waste lake does not generate its own image but a vibrant red depth.

Does the evidence lay under the threshold of human vision? An *X-ray fluorescence (XRF)* tool, a *mass spectrometer* and an electronic microscope may provide clues, but I haven't yet done these analyses because they belong to the realm of scientific experts and laboratories that are not easy to access. Nevertheless, I have to take them into consideration for further investigations. This said, some closer analyses on water and soil chemical components might provide only singular aspects of the problem, and are not able to extensively measure the contamination of the underground aquifers.

Though local people are not allowed to drink spring water, no scientific researches have been done to determine if the toxic heavy metals released into the groundwater and those carried by the red dust are circulating as transversal agents of contamination, from the body of the earth to the body of people. In any case, determining this kind of evidence would be difficult, considering the fact that the area of Tulcea has been severely hit by the radioactive cloud released by the Chernobyl catastrophe in 1986; to this must

be added the many consequences of the turmoil following the Romanian Revolution.

However, the combined mixture of red tint and sodium hydroxide + heavy metals could be considered, in its volatile form, as a pink-red colour indicator of concentrated red mud/dust, tracing shades on the landscape. Hence, the visual tones helped me to map, via Google satellite, the dispersed infrastructure (the industrial harbour, the factory, the bauxite-transit railway and the red mud pond). Moreover, the dirty presence of the bauxite dust is witnessed every day by local people, and especially when the wind blows hard, infiltrating both houses and bodies. Even the *pink* local honey indicates the expansion of bauxite-waste through its awkward taste and substance.

Then, what kind of story does the caustic soda-sodium hydroxide NaOH narrate? First of all, he is the agent inducing the highly alkaline pH of the red mud lake, around 11-12 according to my chemical pH indicator, what is far from an adequate milieu for life support. The acid-base (alkaline) equilibrium is a major factor to take into account in the balance of every ecosystem. Most of the macro and microorganisms can only survive and thrive in an environment having a pH between 5 and 7.5. Only extremophile organisms called alkaliphiles92 can survive in an alkaline environment, like the probable algae Microcystis sp I could find under the lens of my microscope while observing liquid samples from the bauxite lake. This type of algae are fed by other pollutants; they are capable of high uptake of phosphate and nitrogen that might be provided by the fertilisers spread on the fields around the lake, mixed with carbon dioxide present in the air and water. Specialised literature mentions that these organisms seem to produce (not very human-friendly) toxins, and their metabolism might produce very efficient and resistant enzymes capable of surviving in such hostile milieus. Microcystis sp may be one of the only species present in this bauxite-waste lake. On a human scale vision, it is already possible to notice that no single fish or organic life seems to be able to thrive. However, I suggest that this visible absence of micro-organisms (mainly green algae) enables the iron-bauxite waste to fully generate its vibrant red wavelength that scores the crime scene of the lake as a bloody wound done to Earth.

Another striking point about alkalinity. The pH of sodium hydroxide may be very slowly neutralised in time by the carbon dioxide from the air and trapped in the water. Hence, one could argue that one pollution is naturally remediating another pollution! However, this would be again a shortcut. First of all, it might be useful to know that the caustic properties of the red mud are neutralising heavy metals. That means that while the alkaline pollution is smoothly neutralised by the dioxin one, it slowly releases the set of heavy metal embodied into its substance. This aspect is—by the way—a struggle for bioremediation: to allow bio-accumulators or remediators to live and thrive, you have to lower the pH. But doing so, heavy metals are expanding their harmful agency; vicious circle.

The causticity of sodium hydroxide makes it a lethal agent. I already narrated the drama that happened in 2006 when a man dropped by night into the bauxite lake and was found lifeless the day after. After brief contact, the skin may be irritated or even burnt, as local people experienced in the Ajka alumina sludge spill that happened in Hungary in 2010.

And what about its possible radioactivity? The composition of the primal bauxite rock is made of different types of minerals. Alumine is often bound to uranium or thorium among others, what means that both the rock and its by-product can be radioactive. However, the average of radioactivity depends on the source, and it is a hard way to know the exact composition of the geological deposits of the bauxite mines in Sierra Leone. The suspicion of radiant bauxite-waste led me into a broad panic-field. My systemic fears were dissipated only when I was able to analyse my samples with a Geiger counter and determine that no significant amount of radioactivity was present.

However, many mysteries are still laying under the surface. July 2016, my subaquatic camera was moving into the dead body of water, recording the vibrant red depth... up to the point of two similar capture failures happened on two different days at the same location.

Analog material can archive a great deal of information. The analog sedimentations contain layers of information, with a physical imprint. But what about the digital realm? The computational regime is made up of field data, meta-data and information that are recalculating and processed into themselves. Hence, images are the visible skin of digital material, brought to the visual realm by encoding and decoding processes. The bug of my subaquatic camera was expressing a codex corruption, due to undermined reasons or maybe to an unexpected physical interference. Could we imagine a harmful *geo-agent* corrupting the realm of what can be called **pixel politics**? Can toxicity act onto the codec? Such kind of events can happen when high electromagnetic fields or radioactivity are the actors of a massive interference power, which might not be the case in the bauxite-waste lake. Up to this point, we are staying with the trouble.

KEY MOMENT #5 HACKING MATTERS

[#5_001] POLITICS OF THE DIGITAL HIDDEN WORLD

"[004] Hackers create the possibility of new things entering the world. Not always great things, or even good things, but new things. In art, in science, in philosophy and culture, in any production of knowledge where data can be gathered, where information can be extracted from it, and where in that information new possibilities for the world produced, there are hackers hacking the new out of the old. While we create these new worlds, we do not possess them. That which we create is mortgaged to others, and to the interests of others, to states and corporations who monopolize the means for making worlds we alone discover. We do not own what we produce—it owns us⁹³."

MCKENZIE WARK

Facing the corrupted files of my subaquatic camera, I feel somehow uncomfortable with the fact that we devolve all our recordings and archives to sophisticated—nonetheless fragile—binary computational systems, which presume and demand an absolute trust in the whole set of technological devices. Beyond the frustration of a failed (but so close) readability, this specific 'no-picture' evidence or data corruption is a breaking point addressing an urge to unfold the hidden perspective of the digital realm that conveys pictures to their being. Now, it seems to me obvious that what lies beyond the surface of an image is not only the complex geo-political-materiality but also the layers of digital encoding and decoding processes, in addition to the global computational apparatus. Grasping this concealed realm puts into question and crisis the whole definition of what a picture is.

According to Trevor Paglen, "what's truly revolutionary about the advent of digital images is the fact that they are fundamentally machine-readable: they can only be seen by humans in special circumstances and for short periods of time⁹⁴." Hence, we may rather talk about digital operation rather than images, and we should also dig into the thickening of pictures. Layers of pixels, data, codes and codex are processing their visual existence; they constitutes datasets interplaying with softwares, automatized procedures, bots and more: metadata and additional systems for archiving, storage, search and interpretation, with operations in circulation. Thus, our daily digital images are becoming operative pictures, not far from electro-optical reconnaissance satellite images, which are used as data allowing an action rather than playing a role of representation. Our visual and indexical world is shifting in a realm of *machine-to-machine vision*, in encrypted abstractions. A whole set of non-human actors is interacting.

Datasets and databases are increasingly playing an important role in both political and economic regimes. But it is less obvious that images feeding databases are used to train artificial intelligence to operate both in computational and in the human world. Just today, I come across an article about a hacker that swept 40'000 profile pictures of the dating *Tinder* app to feed a facial dataset collector that intends to use selfies in artificial intelligence training⁹⁵. As we can see, machines are looking at us, and it is worth to say that *image-complexes* are particular modes of power. Pictures are "machine-readable file regardless of a human subject⁹⁶." Moreover, they are agents as well as the encoding/reading machines (*i.e.* immensely powerful artificial intelligence systems information) that process them and the whole set of neural networks that are classifying and tracking them for murky purposes of control and profit.

Through his reflexions, Paglen is revealing a kind of opacity of the landscape of terror. He calls for a critical image practice that challenges this inherited knowledge, hence a complete rethinking of the politics of the image that demands new epistemologies and ethics, as well as the vocabularies needed to develop and share them. "The point here is that if we want to understand the invisible world of machine-machine visual culture, we need to unlearn how to see like humans. We need to learn how to see a parallel universe composed of activations, keypoints, eigenfaces, feature transforms, classifiers, training sets, and the like. But it's not just as simple as learning a different vocabulary. Formal concepts contain epistemological assumptions, which in turn have ethical consequences⁹⁷."

Following Paglen's thoughts, we have to admit that the picture ontology has moved from a representational regime to an algorithmic realm, which implies a shift of perspective. Furthermore, one can say that human vision is also being transformed in a world empowered by machine vision, so much so that human visual culture seems to become more the exception than the rule. Moreover, "pictures are looking at us", says Paglen, which means that the whole computer system is doing so. Human perspective and human vision exceptionalism are both at stake. Therefore image production needs to be challenged; deep pictures need deep critical thinking and acting. The field of politics has broadened: image-making today, in its expanded definition, is a question of operating power, not only in the cunning operation of power, war and labour but also in the creative picture-making domain. That is a call for the creation of patches of resistance.

Paglen adds that "An effective resistance to the totalizing police and market powers exercised through machine vision won't be mounted through ad hoc technology. In the long run, there's no technical "fix" for the exacerbation of the political and economic inequalities that invisible visual culture is primed to encourage. To mediate against the optimizations and predations of a machinic landscape, one must create deliberate inefficiencies and spheres of life removed from market and political predations–"safe houses" in the invisible digital sphere. It is in inefficiency, experimentation, self-expression, and often law-breaking that freedom and political self-representation can be found⁹⁸."

This new perspective firmly addresses the responsibility of image-making. More than stressing the environmental cost of picture production (which means extraction processes to build digital cameras + energy consuming data centres for image storage), or the political power at stake in the representational regime, it makes me want to fool the predatory algorithmic system operating in the dark.

So far, I can see two strategies: cryptography and steganography. Cryptography is the art of writing or solving codes and steganography is the way of hiding text in picture, or picture in text. Both are encryption practices that utilise the hidden material substrates. Encryption implies secrecy, confidentiality, and the drive to hide information from an *adversary*, operating tensions and challenging the relationship between knowledge and power.

In some of my previous works, I already experimented with some steganographic strategies, but it would be too long to develop them in the field of this research. Nowadays, I am developing a kind of low-tech practice, a sort of *organic* experimentation, with my initial image of the bauxite-waste lake. The code is the DNA of my picture, that needs translation tools to be read and understood. One easy way to get the encrypted data is to open a picture with *TextEdit*, a simple text editor and open source word processor. The resulting *text* is very few semantic and looks like an aggregate of glyphs:

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At that level, it is possible to copy, cut and paste the code, and even to implement semantic sentences. When the edited *text-code* is saved, it is re-processed into its image format, so long as the code has not been too damaged. Due to the lack of control over the process, the resulting picture can look unaffected or can show a whole set of disturbances. As an outcome, the glitched image reveals through the chaotic pixel recombination its infected/infiltrated condition and expresses that there is a physicality behind representation, that means that we see a picture of text, not exclusively a pictural representation.

For Mckenzie Wark, "To hack is to release the virtual into the actual, to express the difference of the real⁹⁹." The image is a kind of alibi when we go in and operate clandestine operation into the code; it becomes another world. While doing this kind of manipulation, I can feel a sort of parasitic relationship taking place, operating mutations on the surface/visuality of the host. Too many operations can kill the host, wich stresses the need for a (respectful ?) symbiotic behaviour. Through an empirical approach, it becomes somehow possible to understand the critical coded zones, but it seems to be hardly impossible to truly control and master the outcome. At some point, I am wondering if this emphasis on the algorithmic-machinic realm really makes sense while the sixth mass extinction is taking place... Nevertheless, these real-time interferences into the coded core of a visual data and the resulting disturbances could be an operative way to figure out the material malfeasance of toxic substances operating in the core of a real landscape, and could be as well used as a tool to corrupt the indexical regime, the power and the seduction of images.

In brief, the *xeno*-encrypted *post-image* could be a method to fool the indexicality of the image for the artificial intelligence learning, apart from the fact that we don't really understand how machines do look at our pictures... This method is not pretending to be a solution; it is more a humble *DIY* attempt at an artistic reappropriation that needs to be examined and processed further. The experimental field is huge and the next step could be the implementation of (a decoded) DNA of an extremophile bacteria from the bauxite lake.

"Global landscapes today are strewn with this kind of ruins [spaces of abandonment for asset production]. Still, these places can be lively despite announcements of their death; abandoned asset fields sometimes yield new multispecies and multicultural life. In a global state of precarity, we don't have choices other than looking for life in ruins¹⁰⁰."

ANNA TSING

The ecological crisis is an epistemic panic field; Anna Tsing stresses out that we are now broadly experiencing a situation of contaminated ruins. However, she considers contamination as a transformative process, more precisely as a multi-species encounter in a set of dynamic relationships, that implies multiple forms of cooperations, or let's say mutualities. In this respect, there is an urge to find new ways of working together in a collaborative way, what could be a strategy to decontaminate our fear of environmental apocalypse, death, and many others. In order to reshape the landscape in post-capitalism, we need to think collaboratively, inter-cooperatively, contextually and we have to act physically on the field. Then how do we get to the post-capitalist? One way could be to stop the constant engineering of nature and to take over capitalist tools and technologies, to rework, open and change them for a post-capitalist society. This is the aim of some emergent communities such as biohackerspaces or biohackerlabs, that are, in a collaborative way, developing *DIY* and open tools intended for citizen use.

Up to this point, I need to expand my research in consideration of these arguments. Therefore, I start a collaboration with Vanessa Lorenzo, an artist, media designer and biohacker based at *Hackuarium*¹⁰¹, a Swiss biohackerspace. Our aim is to operate—in a critical way—the linking between the scientific and non-scientific worlds, especially in the frame of anthropogenic violence in environmental crimes, through an artistic practice and alternative tools. In regards to my research, we are looking for new types of growth in the actual biotope of a toxic and technogenic sludge. Could bacterias make a picture of a toxic harm or a toxic material? What are the technical operators that make the bacterias visible? And what are the data of toxic matter?

If we consider extraction and its side-product (waste) as a violence done to Earth, and to use the concept of violence today, we have to challenge the notion of harm. Hence, we need new tools and protocols to register these harms, to trace new evidence of it. Moreover, the ensemble of human and non-human species of an alienated ecosystem can be considered at each level as witnesses. By knitting cybernetic arrays with scientific and *DIY* processes, we extract, plot and render information from the resisting ecosystem and the set of bodies that inhabits it. However, even if a technology is a way to grasp the invisible, data is provided by the technospheric apparatus that governs us humans on a semiotic and political level. Through the technical devices, data as are accepted as traces of evidence, which are discourses that need interpretations.

Following protocols such as water and soil sampling, microbe culturing, *chromatography*, and other experiments, we reach to allow biological and geological matter to interfere us and question the grounds of our notion of materiality considering media beyond the play of semiotic interpretations and modes of representation.

In the frame of the exhibition *La* sémiosphère du Commun (February to March 2017)—an invitation by Anna Barseghian – Utopiana—we are presenting an installation mapping the politics of mining, refining and polluting, among several material witnesses (red mud samples, resistant bacteria or algae in Petri dishes). In collaboration with the artists (also showing their own projects) Emanuela Ascari and Peter McCoy (*Radical Mycology*), we challenge our samples with their own operative DIY tools: *chromatography* with Emanuela and protocols for mycoremediation with Peter.



Chromatography, also called Capillary dynamolysis¹⁰², is a specific method to study the formative forces in inorganic and organic substances, mostly used in biodynamic farming (and in a more sophisticated way in laboratories as a technique for the separation of a mixture) to analyse the quality and the vitality of soils. With the Capillary Dynamolysis technique, "patterns are produced on thin-layer chromatographic paper and evaluated as a fingerprint of the sample as a whole¹⁰³." The differing patterns left by forces at work in soil life create a direct imprint or picture of the substance that can be interpreted directly. This kind of spectral methods reminds me the early experiments in photography, when scientists and photographers were trying to capture the etheric flow of both humans and non-humans¹⁰⁴. Hence, the soil sample witnesses its own vitalic properties and indicates in a visual way the amount of mineral, organic and enzymatic matter it is made of. Our attempt to use chromatography for the analyse of the bauxite-waste samples (sludge and dust)-with the intention to avoid the lens/optical apparatus to generate an image-is a way to trigger a kind of ontological picture of the red mud. The chromatographies are showing the absence of organic and enzymatic elements, and one can notice that the dust sample is showing somehow more vitality than the other one.

Our second experiment is driven by reflexions about species entanglements and possible cooperations into modernist ruins. Considering the actual geo and bioengineering attempt as potentially critical issues, we are wondering if a strategy closer to *natural* processes could be a way for the re-articulation of our relationship to ruined environments. Is there a way to *hack* toxified soils with the help of clever microorganisms?

For many years, Peter McCoy and his collective are leading empirical researches on mycoremediation. He informs us that fungi are our best chemists, channelling mineral and chemical substances through large mycelium nets and conveying vital elements to plants and trees. More that supporting plant's health, some species are able to translocate heavy metals from the ground into plants; some are even capable of breaking down heavy metals and absorb them. Fungi are always in collaboration with other species, bacterias, plants and other organisms, and a possible positive cooperation with humans may be developed further. Nevertheless, the process of mycoremediation is on one hand complex and takes years, and on the other one is not exempt from possible hazardous side effects.

However, in the frame of this context, we are in a situation of a speculative experiment that aims to improve a remediation process of bauxite-waste samples with the agency of fungi. To do so, we start (from a simple protocol) a micro-culture of two species of common fungi that Peter brought for the purpose of the exhibition, the *Pearl Oyster (Pleurotus Ostreatus)* and the *Turkey Tail (Trametes Versicolor)*, adding them a little amount of both red mud soil and red mud dust. After the first week of growth, the mycelium is showing different ability to thrive in contact with the post-bauxite substances. The encounter with *Pleurotus Ostreanus* does not seem to be a success story, but *Trametes Versicolor* is showing a higher vitality and is taking shape in a compelling visual way. At least, its growth stops at the edge of the red mud. Hence, it is evident that the remediation of a complex waste such as the red mud needs further researches and experiments, and its applicability on a large landfill with a particular and complex environment is thus another story. To conclude, photography is *like a tree that is hiding the forest*, whose seductivity does not seem to be an efficient epistemological tool, in particular in the negotiation with complexity. I feel an urgent need to decolonize our life from all the addictive, invasive and polluting machinic eyes and apparatus that surround us as fetish tools or control systems. Moreover, we need to deconstruct our representational regime and mindset, to allow other ways of looking at things, objects, non-humans and other agents. Living and dynamic processes are antinomic with the fixed indexical realm. However, both colonies of bacteria and fungi are shaping their own ontologic pictures and are teaching us. On another scale, aluminium is making quasi-invisible lethal alliances with our cells, and its by-product bauxite-waste is corrupting our micro and macro ecosystems through its deviant red vitalism.

Rather than claiming the absolute reliability of our processes, our speculative artistic approach is essential for the generation of hypothesis that challenges our notions and capacity of perception; Therefore, hacking matters.

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- 1. Brunner Christoph, Nigro Roberto, Rauning Gerald (2013) Post-Media Activism, Social Ecology and Eco-art, in Third Text.
- 2. Indexicality: A term coined by Charles Sanders Pierce. He defines indexicality as the ability to capture the so-called 'reality' and represent it in its own form, format and frame.
- Ecosophy: The development of mechanisms of decentralisation, de-multiplication of forms of antagonisms, and processes of singularization.
- 4. Felix Guattari (1989) The Three ecologies, in New Formations, number 8.
- 5. Robert Shore, Toxicity's sublime Seductions: Edward Burtynsky.
- 6. *ibid*.
- 7. ibid.
- In his essay On the Invention of Photographic Meaning (1974), Allan Sekula points two main fashions that are driving photography since its birth: 1) The 'symbolist' folk-myth, which is the triumph of metaphor, more precisely the metaphorical substitution of the context of the image, a kind of belief in 'the truth of magic' (Alfred Stieglitz as a major representent of this fashion).
 2) The 'realist' folk-myth or the documentary model, intended as the 'truth of science', a folklore of metonymic and 'neutral' vision which reveals to be complicit in the social order instituted by capitalism (cf Lewis Hine's work).
- 9. In *Essential Elements*, book written by writer and curator Ewing Bill on Burtynsky's work: "It occurred to me that what was missing was a vue d'ensemble, something that would highlight his aesthetic rather than see through the filter of a subject like China or oil or whatever" (...) " You will see colour schemes uniting pictures here, or a certain compositional dynamic doing it there."
- 10. T.J. Demos (2015) Capitalocene Violence, in Still Searching, Fotomuseum Winterthur.
- 11. Demos is quoting Walter Benjamin's insight about fascist aesthetics: "Its self-alienation has reached the point where it can experience its own annihilation as a supreme aesthetic pleasure." In *The Work of Art in the Age of its Technological Reproducibility: Selected Writings:* 1938-1940, ed., Howard Eiland and Michael William Jennings.
- 12. T.J. Demos (2015) Capitalocene Violence, in Still Searching, Fotomuseum Winterthur.
- 13. Allan Sekula (2013) Ecrits sur la photographie, Beaux-Arts de Paris éditions. p. 53.
- 14. ibid., p. 64-65.
- 15. T.J. Demos (2015) Welcome to the Anthropocene!, in Still Searching, Fotomuseum Winterthur.
- 16. Paul Virilio (2008), Terra Nova, an interview by Yvon Le Mignan and Ariel Kyrou.
- 17. T.J. Demos (2015) *Geo-Engineering the Anthtropocene*, in *Still Searching*, Fotomuseum Winterthur.
- 18. Source: http://systemchangenotclimatechange.org
- 19. T.J. Demos (2015) *Geo-Engineering the Anthtropocene*, in *Still Searching*, Fotomuseum Winterthur.
- 20. http://www.i-trans.net/forum-trans/viewtopic.php?f=3&t=11604&start=50&view=print.
- Jason W. Moore (2016) Anthropocene or Capitalocene: Nature, History, and the Crisis of Capitalism.
- 22. Kieran Suckling is Director of the Center for Biological Diversity, Columbia University.
- 23. Atomic Geography; Source: https://atomicgeography.com/tag/cyborgocene
- 24. Justin McBrien, Accumulating Extinction: Planetary Catastrophism in the Necrocene.
- 25. Jason Moore (2014) The Capitalocene.
- 26. Gabrielle Hecht (2011)Entangled Geographies, Empire and Technopolitics in the Global Cold War, The MIT Press, p.5.
- 27. Peter K. Haff, who first postulated the theory in April 2014, defined the technosphere as the connection between people and artefacts—the interlinked set of communication, transportation, bureaucratic and other systems that act to metabolise fossil fuels and other energy resources. According to Haff, the technocene has not been created independently by humans but represents a quasi-autonomous force that shapes the modern human condition. Source: Jesse Peterson and Alex Zahara (2016) Anthropocene Adjustments: Discarding the Technosphere.

- Felix Padel, Samarendra Das (2010) Out of this Earth: East India Adivasis and the Aluminium Cartel; Orient Blackswan. p 75.
- 29. Slow violence is an expression by Rob Nixon.
- 30. To make kin is an expression by Donna Haraway: "I think that the stretch and recomposition of kin are allowed by the fact that all earthlings are kin in the deepest sense, and it is past time to practice better care of kinds-asassemblages (not species one at a time). Kin is an assembling sort of word. All critters share a common "flesh," laterally, semiotically, and genealogically. Ancestors turn out to be very interesting strangers; kin are unfamiliar (outside what we thought was family or gens), uncanny, haunting, active." Source: Donna Haraway (2015) Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin; in Environmental Humanities, vol. 6.
- 31. Source: http://geology.com/minerals/bauxite.shtml
- 32. Amphoteric: able to act as a base (= substance with a pH of more than 7) or an acid.
- 33. Pelikan, Cloos and Hauschka are scientists in the tradition of Rudolf Steiner/Goethian-inspired science.
- Felix Padel, Samarendra Das (2010) Out of this Earth: East India Adivasis and the Aluminium Cartel; Orient Blackswan. p.218.
- Martine Valo (2016) L'usine d'alumine de Gardanne continue de polluer le Parc marin des Calanques; article published in Le Monde.
- 36. Source: Vi Holding's website: http://www.viholding.com/en/napravleniya_biznesa/metallurgija
- 37. Marco Group seems to have been first established by the controversial commodities trader Marc Rich ('Aluminium Finger', well known commodity traider, involved in illegal weapons trafficking and tax evasion. He is also the Founder of Glencore International (1994), focused on the physical marketing of ferrous and non-ferrous metals and minerals and crude oil. Its headquarter is based in Switzerland).
- 38. Both are successfull businessmen who have built their success story on timber, oil, gas and natural resources.
- 39. OCCRP is the acronym for Organized Crime and Corruption Reporting Project.
- 40. Russian name for The East Project.
- 41. Source: OCCRP, Lawsuit Gives Insight Into Power Industry; the Vostok project.
- 42. Cosmin Zaharia (2014) Gheorghe Dobra, șeful Alro: Îndeplinim toate cerințele UE privind protecția mediului; in Green Report.
- 43. Excerp from Wall-Street Romania in 2012: "The company received last year energy from Hidroelectrica on the basis of a contract of 322.47 million lei, the largest of the bilateral contracts of the state-owned electricity producer. Direct power sale contracts at prices below those in the market were concluded by Hidroelectrica between 2001 and 2003 and expire in 2014, 2015 or 2018."
- 44. Excerp from Gheorghe Dobra, Wimetco's Chief Executive Officer: «(...)The strong increase in (EU) ecotaxes over the last three years makes Alro the most large electricity costs in Europe and even in the world, and if the government does not take immediate action to reduce the costs incurred by industrial producers to support renewable energy production, then Alro could shut down most of its production, which would be a powerful blow to the economy.» Source : Andrei Chirileasa (2014) Gheorghe Dobra, Alro: E o problemă de luni, nu de ani, cât mai rezistăm în condițiile actuale; in ZF Burse-Fonduri Mutuale.
- 45. More recently, a humanitarian crisis happened in Sierra Leone due to the spread of Ebola virus over the country and weak healthcare infrastructures. But these troubles do not seem to disturb business so far.
- 46. Peter Griffiths (2003) The Economist's Tale: A Consultant Encounters Hunger and the World Bank, Zed Books Ltd.
- Felix Padel, Samarendra Das (2010) Out of this Earth: East India Adivasis and the Aluminium Cartel; Orient Blackswan. p 75.
- 48. According to Roger Moody, *Transfer pricing* is "a process of artificially redistributing conpany's costs between different stages of process in its products, and/or between the company's operations in different countries, for financial advantages. Although the process can be quite complex, and of its nature is a higly secretive procedure, in essence it is quite simple. Material, goods or services, are priced by a company at an untrue, low rate in a high-tax zone, in order to escape heavy duties, and the difference in value added is made up by inflating production charges at another stage in a low-tax or tax-free zone. Thus, true production costs and product value are disguised in a way that suits the company best. The larger the corporation, the more massive the tax evasion can become." Source: Roger Moody (1992) *The Gulliver File: Mines, Land and People—A Global Battleground*, Minewatch.
- 49. Felix Padel, Samarendra Das (2010) *Out of this Earth: East India Adivasis and the Aluminium Cartel*; Orient Blackswan. p. 413
- 50. Informations provided by World Aluminium, the International Aluminium Institute
- 51. Felix Padel, Samarendra Das (2010) *Out of this Earth: East India Adivasis and the Aluminium Cartel*; Orient Blackswan. p 415.
- 52. ibid. p. 380.

- Source: UC RUSAL's website, leader of the global aluminum. <u>http://www.aluminiumleader.</u> com/history/industry_history
- 54. Felix Padel, Samarendra Das (2010) *Out of this Earth: East India Adivasis and the Aluminium Cartel*; Orient Blackswan. p.113.
- Ronald Graham (1982) The Aluminium Industry and the Third World: Multinational corporations and underdevelopment; Zed Books. p.235
- 56. Source: Global Security; <u>http://www.globalsecurity.org/military/systems/munitions/blu-82.</u> <u>htm</u>
- 57. Source: Global Security; http://www.globalsecurity.org/military/systems/munitions/blu-82specs.htm
- 58. The Thermite Process. Source https://en.wikipedia.org/wiki/Thermite
- Source: Swiss Confederation's website, Ausfuhr von Kriegsmaterial im Jahr 2015; <u>https://</u> www.seco.admin.ch/seco/de/home/seco/nsb-news.msg-id-60740.html
- 60. Ten percent of alumine is not smelted into aluminium but is used as chemical component.
- 61. Source: http://www.dangersalimentaires.com/2011/01/les-additifs-alimentaires/
- 62. Toxic powdered aluminium used as a gray dye allowed in France under certain conditions - used for the surface staining of cold meats, sweets, confectionery, pastry decoration (eg, metallic-like dragees used for wedding cakes) and preserving brine for preserving candies.
- 63. Aluminium, CAS No 7429-90-5, Aluminium Sulphate, Aluminium Sodium Sulphate, Aluminium Potassium Sulphate, Aluminium Ammonium Sulphate, Sodium Aluminium Phosphate, Aluminium Silicate Sodium and Aluminium Silicate, Potassium Aluminium Silicate, Calcium Aluminium Silicate, Aluminium Silicate (kaolin), Aluminium Starch Octenyl Succinate, Aluminium Lacquer.
- 64. Shlam is the name local people give to the bauxite-waste lake.
- 65. The use of wells is very common in Romanian villages.
- 66. Sodium hydroxide or caustic soda.
- 67. David Abram, The Ecology of Wonder: Between the body and the breathing earth, excerpt of a conference done on 15th Septembre 2015 in Genenva, in the frame of the exhibition La bête et l'adversité, curated by Utopiana.
- 68. Kenneth Meadows (1997) The Medicine way: A Shamanic Path to Self Mastery (The "Earth Quest" Series), Element Books Ltd. p.180.
- 69. Felix Padel, Samarendra Das (2010) *Out of this Earth: East India Adivasis and the Aluminium Cartel*; Orient Blackswan.
- 70. An Actant, in Bruno Latour's definition is a source of action that can be either human or non-human. It's an entity that modifies another entity in a trial. ('Protoactants' are entities that are too small or too fast to be 'things'.)
- 71. Sentient: particular qualities of living.
- 72. Affect in Spinoza's definition: which refers broadly to the capacity of any body for activity and responsiveness. It is an impersonnal power, that maybe has to be defined. Vitality is the capacity of things to act as quasi agents or forces with trajectories, propensities, or tendencies of their owns. Material vitalism is a concept by Gilles Deleuze and Felix Guattari: Assemblages are the basic unit of inorganic life and vitality is immanent in matter-energy.
- 73. Jane Bennett (2010) Vibrant Matter, a political ecology of things; Durham and London: Duke University Press. p 15.
- 74. Ibid.
- 75. Anna Lowenhaupt Tsing (2015) The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins Princeton University Press. p.33.
- John Durham Peters, (2015) The Marvelous Clouds, Toward a Philosophy of Elemental Media, The University of Chicago Press. p.9.
- 77. Jussi Parikka (2015) A Geology of Media, University Of Minnesota Press. p.14.
- 78. Natureculture is for Haraway a way to understand the inherently interconnected nature of the two terms that in Cartesian ontology were separated across the field of the infamus binaries of nature versus culture, mind vesus matter and so on.

- 79. Anna Lowenhaupt Tsing (2015) The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins , Princeton University Press.
- 80. Susan Schuppli (2016) Dirty Pictures, in Living Earth, Field notes from the Dark Ecology Project 2014-2016, Sonic Acts.
- 81. Godofredo Pereira (2014) *Geoforensics: Underground Violence in the Atacama Desert*, in *Forensis–The Architecture of Public Truth*, Sternberg Press.
- 82. Susan Schuppli (2015) Slick Images: The Photogenic Politics of Oil, Extra City.
- 83. ibid.
- 84. Susan Schuppli (2016) Dirty Pictures, in Living Earth, Field notes from the Dark Ecology Project 2014-2016, Sonic Acts.
- 85. ibid.
- 86. Susan Schuppli (2015) Slick Images: The Photogenic Politics of Oil, Extra City.
- Deepwater Horizon was an ultra-deepwater offshore drilling rig located in the Gulf of Mexico, whose apocalyptic explosion in 2010 has spewed an estimated 4.1 million barrels of crude oil into the Gulf.
- 88. Susan Schuppli (2015) Slick Images: The Photogenic Politics of Oil, Extra City.
- 89. ibid.
- Nicolas Martin (2017) Sols contaminés: avons-nous empoisonné la Terre?; in La Méthode scientifique, France Culture.
- 91. In July 2016, Lake Urmia morhped into intense red, likely due to bacteria and algae blooms "In the marine environment, Dunaliella salina appears green," Mohammad Tourian, a scientist at the University of Stuttgart, tells NASA. "However, in conditions of high salinity and light intensity, the micro-algae turns red due to the production of protective carotenoids in the cells ».(...) A family of bacteria called Halobacteriaceae may also play a role: These salt-loving organisms use a red pigment to absorb sunlight and convert it into energy, so large amounts of them in the water may be contributing to the ruddy hue." Elaina Zachos (08.2016) *Why a Giant Green Lake Turned Blood-Red*; National Geographic.
- 92. Alkaliphiles are able to survive in an alkaline environment because of a membrane system that actively pumps H+ across the cell membrane into their cytoplasm and therefore able to maintain pH of about 8.0. Others have evolved pH stable enzymes that help them survive an alkaline environment. Source : http://www.biology-online.org/dictionary/Alkaliphile.
- 93. McKenzie Wark (2004) A Hacker Manifesto, Harvard University Press. p.13.
- 94. Trevor Paglen (2016) Invisible Images (Your Pictures Are Looking at You), in The New Inquiry.
- Natasha Lomas (Posted Apr 28, 2017) Someone scraped 40,000 Tinder selfies to make a facial dataset for AI experiments; https://techcrunch.com/2017/04/28/someone-scraped-40000-tinder-selfies-to-make-a-facial-dataset-for-ai-experiments/.
- 96. Trevor Paglen (2016) Invisible Images (Your Pictures Are Looking at You), in The New Inquiry.
- 97. ibid.
- 98. ibid.
- 99. McKenzie Wark (2004) A Hacker Manifesto, Harvard University Press. p.40.
- 100. Anna Lowenhaupt Tsing (2015) The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins, Princeton University Press. p.246.
- 101. http://wiki.hackuarium.ch/w/Main_Page
- 102. Dr. Johannes Kahl (2010) The capillary dynamolysis method as a characterized tool for crop quality determination. Source : http://orgprints.org/7308/
- 103. ibid.
- 104. i.e Hippolyte Baraduc and Louis Darget among ohters, at the end of the nineteenth century.

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