



permeance



2020 | 2022

The 'Permeance' project is a rhizomatic artistic research initiated during Decolonizing Architecture Advanced Studies at the Kungliga Konsthögskolan led by professor Alessandro Petti and Marie-Louise Richards, and pursued in parallel to the Cultural Anthropology and Development Studies postgraduate at the KULeuven. Motivated by the desire to ground my practice to my inherited landscape, I followed the traces of the cadmium contamination in the river Dommel upstream and into the past, uncovering a chain of events which talk about colonialism and extractions. From the zinc smelting industries across the Belgium border to the Emu Foot Province in northern Queensland, permeability reveals, through the contaminations of river biota and the riverbed soil, how Australian colonial history has become linked to the pollution of the river Dommel. In a subversive act towards a scientific and modern ideology, the agency of the pollute river is amplified through the misuse of chromatography, initiating a beyond-human communication with earth, on a macroscopic scale and in wavelengths visible to human eyes.

#thepermeanceproject



the river

Dommel,
the Netherlands

The river Dommel is a natural fluvial system extending for the length of 146km, originating in Peer, Belgium and joining the river Meuse in the Netherlands. Triggered by the sight of the scraped down river banks of the Dommel, I began noticing multiple anthropogenic interventions along the river course; these were consequential measures in response to the high levels of cadmium and zinc contamination in the soil of the river bed. The pollutants were emitted by the nearby zinc-ore smelters in the Flemish Neerpelt, right across the Dutch border, which have been active in producing zinc blocks and sheets for over 125 years. The process of zinc extraction and fusion from metal ores was particularly polluting in the past due to the release of toxic gases and contaminated water with dissolved zinc and cadmium particles. These industrial waste waters have been dumped for over a century into a ditch, the Eindergatloop, which runs along the border of the terrain, where the water stream carried the pollution further along to merge into the river Dommel. In the 1980s, after 85 years of uncontrolled industrial discharge, it became evident that the river bed of the Dommel had particularly high levels of zinc and cadmium, both heavy metals which settle and attach to the sediment once the water stream slows down. Soil decontamination projects have been carried out

by the organization Waterschap de Dommel, by scraping the river bottom and banks, and displacing the contaminated ground elsewhere. Despite the reduction of direct pollution from the smelters, the concentration of zinc and cadmium in the river sediment is still dangerously high for both aquatic and terrestrial creatures. These metals have permeated through bodies, from the river into the aquatic flora and from the displaced earth into the nearby vegetation. Cadmium has also permeated into the bodies of macro invertebrates such as earthworms, and microalgae such as diatoms. These biotas serve scientists as river pollution indicators and in this story, cadmium and zinc act as tracers as they continue their permeating journey, leaving behind a trail which reveals how entangled, contaminated and polluted our beyond-human encounters really are. The leitmotif of this research is the ability of zinc and cadmium to permeate through time and environments and, as we will discover, it has also left a thread leading to its geological origins in Queensland, Australia.

The zinc industry in Neerpelt operated under various company names, over time fusing with other corporations such as Umicore, the Australian Zinifex and nowadays, Nyrstar. In 2000, Zinifex began importing raw material from Australian

**Emu Foot Province,
Queensland,
Australia**

Century Mine, also owned by the then Zinifex corporation. Between 1999 and 2016, Century Mine was one of the world's largest open pit zinc mines. Located in North Queensland, an Australian region known for its vast mineral deposits of zinc, copper and silver, the mine sits 250 km north-west of the city of Mount Isa. The surrounding territories to Mount Isa have been the land of the Kalkadoon people, Aboriginal inhabitants of the Emu Foot Province, for over 60000 years. Their lands were dispossessed in 1884, after the Kalkadoons' final battle against the colonization by white settlers. This war is remembered today as 'Battle Mountain', during which 150 Kalkadoon natives were killed for resisting settlers. Over the course of the following 6 years, between 1878 and 1884, it is estimated that up to 900 Kalkadoon lost their lives while defending their people and lands from incursions. 255 years prior, in 1606, the Dutch colonial navigator Willem Jansz had arrived as the first European in Australia by approaching the shores of northern Queensland. His explorations and the following first European mappings of the continent opened the doors to the European colonization and exploitation of Australia.

Through the lens of permeability, the chain of events uncovered by soil contaminations and abnormal biota indexes have led upstream to Australia's colonial history, and as a result, the story of the Kalkadoon people has become linked to the pollution of the river Dommel.





permeance

to permeate,
permeability,
permeation,
permeating,
permeance:

the action to diffuse
through or penetrate
something

In this research I propose permeability as a conceptual lens through which to approach the entanglements of earthly life. In many ways, permeation is similar to the organic process imagined by Donna Haraway as a 'zoophagous chain of critters engulfing one another'. However, I envision permeability also as a mode of operating through principles of physics and chemical processes, as well as molecular exchanges and biological absorptions. In the book 'Staying with the Trouble', Haraway also reflects on rehabilitation, or making livable again, only possible if we manage to recognize "the porous tissues and open edges of damaged but still ongoing living worlds" [1]. Comparably, permeability can also stimulate exchanges between bodies and natural entities. Through a permeable vision we all, living and non-living, become part of a greater, more penetrable world. The impermeable membranes, so desirably sought after by modernity's categorizations, deteriorate into a pile of compost which stimulates exchanges of substances, nutrients, molecules and microorganisms.

Permeance also implies an awareness of our participation in symbiotic relationships with

[1] Haraway, D.J. (2016). *Staying with the Trouble. Making Kin in the Chthulucene*. London, England: Duke University Press

Earth. Dismantling our parasitic use of the environment and its forms of life, requires us to permeate through them in mutualistic, reciprocal encounters. Anna Tsing in 'The Mushroom at the End of the World' writes that "we are contaminated by our encounters" [2]; we cause and absorb pollutions through our interactions with earthly beings and matter. We all, living creatures, also carry the record of past encounters. This is the key to evolution; it is in the matter that composes our beings that we hold the histories of our contaminations. Not only do we carry pollutants in our biology, in our permeating encounters we also contaminate through social interactions and relations to the land –colonialism and extractions are among those practices– generating a "contaminated diversity [which] implicates survivors in histories of greed, violence and environmental destruction" [2]. Permeance uncovers the tracks of such happenings, allowing us to look into the past by following contaminations along a chain of events. Tsing states that in order to acquire the necessary skills to be able to live in ruins, we must be able to recognize and accept these contaminations. In particular, the notion of permeability enables us to trace and

[2] Tsing, A. (2015). *The Mushroom at the End of the World, On the Possibility of Life in Capitalist Ruins*. Princeton, USA: Princeton University Press

understand the ruins we inhabit. This emphasis on permeance as past remains can be aligned to the exposition of contamination as 'tracer', as Tsing writes in 'Arts of Living on a Damaged Planet': "Our modes of noticing, however, are themselves monstrous in their connection to Man's conquest. Much of what we know about ecological connection comes from tracking the movements of radiation and other pollutants. Contamination often acts as a 'tracer'—a way to see relations. We notice connections in part through their ruination." [3]. This research indeed follows a history of pollution, which has been the ruination of both ecosystems and indigenous cultures. Unfortunately, these histories still need to be recognized, as the ability to notice has yet to be refined by the Western eye. Too often we –in the West– are blinded by our perception that our actions are impermeable. Instead, permeating is only possible if we see beyond our limits and borders: rivers flow between confines; histories of pollution can be displaced but not erased; contaminations can be absorbed but do not vanish; material histories can take you back to their geologies; and along them stories of extractions and colonial violence emerge. *Permeating unsilences*.

[3] Tsing, A., Swanson, H., Gan, E., & Bubandt, N. (2017). *Arts of living on a damaged planet*. Minnesota, USA: University of Minnesota Press





on chromatograms

mapping

Situated between a scientific backdrop and artistic production, this research materializes through the medium of soil chromatographies, a form of alternative, non-representational photography, which gives agency to contaminated earths by revealing their chemical compositions through their permeation in the paper medium. By sampling along crucial points of the river, the soils used to create the chromatography actually unearths a mapping of pollutants. The result is a fundamental critique to both photography and cartography as anthropocentric and modern readings of the world. Moreover, through an alternate mapping, I wish to highlight the innate problematic of cartography as tools for colonization of land and people. In opposition, the proposed mapping of the river blurs the lines —through contaminations— between art and science, dismantling the modern from a western positionality and proposing a demodern alternative. By critically reviewing the dominating human-centered practice of mapping, I searched for a new balance between my presence and the agency to the voices of living and non-living bodies. Moreover, chromatography as an artistic practice reclaims a scientific technique called Pfeiffer's circular chromatography (PCC), commonly used as an analytical indicator

of compounds. Indeed, the method is mostly used in laboratories under carefully monitored conditions, mainly to assess the chemical composition and health of earth samples. Chromatography can be described as a compound separation method through absorption which develops the single elements through a light sensitive reaction. By misusing chromatographies, in an photographic artistic performance through the contamination of polluted soil samples, I conducted a subversive act towards a methodology which belongs to a modern scientific narrative.

Furthermore, practicing chromatography as alternative photography “minimizes optic unconsciousness, to put into question some of the most controversial concepts on photographic ontology, and to adopt highly critical stances on issues related to representation and communication” [4]. Compared to camera derived photography, the chromatographic act does not attempt to seize the ephemerality of an instant, nor does it create an othering dichotomy of subject | object via a photographer’s gaze. Rather, through the chromatographic absorption, the strong will of the earth solution is transposed into the paper:

misuse

collaborative
chromatography

the piece becomes saturated with subjectivity. Therefore, chromatography inevitably problematizes the dualistic narratives of subject | object of mainstream photography, and highlights the complexity of the new ontology created. Indeed, the result is not an objective nor superficial representation of the contaminated soil, it actually *is* the contamination. Indeed, my intention is to collaborate with soil in this act of non-human photography. Ultimately, as we combine our agencies, I seek to offer an instrument which the contaminated soils can use to communicate with humans on a macroscopic scale and in wavelengths visible to our eyes. Through collaborative chromatography, I conduct –bring together– the voices of the riverbed soil, permeating into each other, to speak about contaminations and map the voice of the river.

[4] Pla-Vivas, V. (2021). Operating in alternative photography: agency through prolonged photographic acts. *Journal of Visual Art Practice*, 20:1-2, 64-80.



earth's agency

Rather than projecting human narrations onto inanimate things, as a form of ventriloquism, I propose the following speculation: instead of 'elevating through translation' the voice of cadmium polluted soils, I suggest humans make the leap to understand the other forms of communication of entities which do not speak with voices. Similarly, Ingold suggests that this emancipation of things should operate under an "inverse humanism [...]" according to which, rather than raising things to the power of the human, humans and things alike are factorised down to their primordial material denominator. Life on Earth." [5]. Ingold continues by urging us to see "humans and things as submerged on an equal ontological footing in 'an ocean of materials. [...] Once we acknowledge our immersion, what this ocean reveals to us is [...] a flux in which materials of the most diverse kinds - through processes of admixture and distillation, of coagulation and dispersal, and of evaporation and precipitation - undergo continual generation and transformation. The forms of things, far from having been imposed from an inert substrate, arise and are borne along - as indeed we are too - within this current of materials." [5] Thus, it is not things

[5] Ingold in Holbraad, M. (2011). *Can the Thing Speak?* Open Anthropology Cooperative Press. University College London.

making the leap

ontological re-constitution

the language of earth

which elevate to the human condition, rather us humans who come to terms with our physicality and belonging to the material biogeochemical cycles of Earth. This, according to Holbraad, calls for an "ontological re-constitution", a post-human (or inverse human) approach for the "re-definition of people's and thing's properties" [5], as well as, I might add, their form of interacting. I propose permeance as the conceptual frame through which we humans are able to understand the language of contaminated soils: permeability as a new ontology. Under this light, a material channel for post-human communication might be the colorful patterns of chromatograms. Together we create the ground for a common language, them, drawing with their presence in visible colors and patterns, and we, reading their pioneering visual language.

Based upon Charles Peirce's 19th century study of semiotics, Kohn [6] describes the forms of representation which exist between human and non-human encounters, distinguishing them as signs which hold the potential of initiating an interspecies conversation. In particular, Kohn discusses a specific sign, the index, its characteristic being that of pointing the attention towards what it represents, although

[6] Kohn, E. (2013b, May 10). *Thinking with a Forest's Thoughts*. [Video lecture]. YouTube.

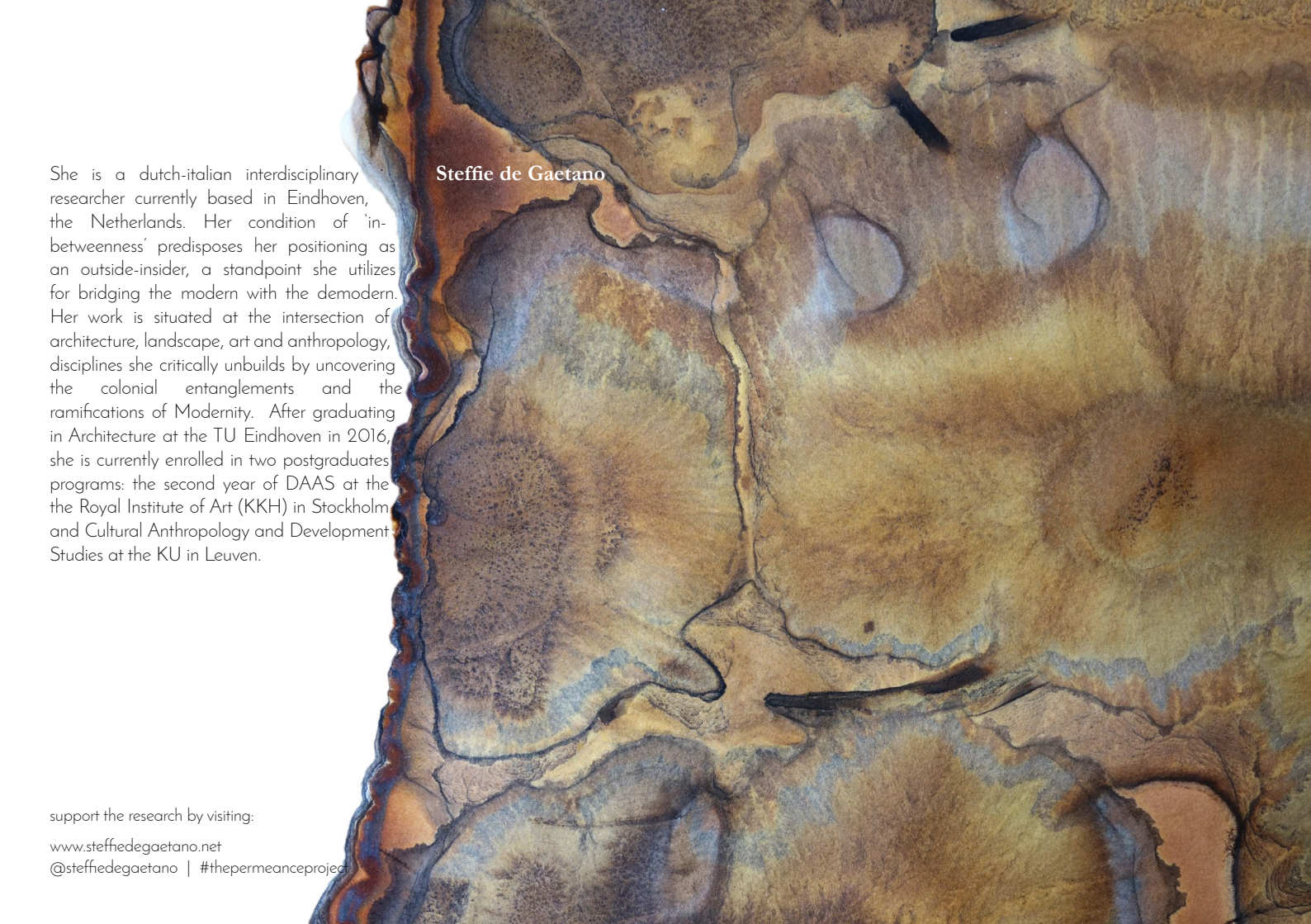
the direct correlation might be unclear at first [6]. By making us notice the signs which reflect the thoughts of non-human entities, we gain a greater sensibility towards the beyond-human relationships. The colors and shapes revealed through chromatography can be read as indices, as they suggest the presence of contaminants and material compounds of the river. Patterns can refer to the content of mineral levels, organic matter or humus, the more complex the design the more diverse and healthy the earth [7]. Color deposits indicate the chemical composition, intense warm hues stand for a better quality soil, while cooler colors indicate a poor microbial activity [7]. Thus, particular gradations of color in the chromatography can be taken as indices of cadmium pollution, channelling the soil's agency. The contaminants as well are manifested as visible, light sensitive signs we humans can see and understand. But as Kohn [6] reminds us, these events occur with or without our human presence, whether we acknowledge the indexes or not: the river environment degrades nonetheless, even if we are unable to recognize the colorful indexes. However, chromatography is more than an indexical reproduction of the world, as the paper

[7] Kokornaczyk, M.O., et al. (2017). *Analysis of soils by means of Pfeiffer's circular chromatography test*. Biological Agriculture & Horticulture, 33(3), 143-157.

how to listen

contains the soil itself: it cannot be considered a reproduction of the contamination, it *is* the contamination.

The question then arises: how can we listen to muted entities speak, beyond the projection of our own thoughts onto them? Kohn's [6] theorizing on indices offers a framework to set things free from human dependency. In fact, not in the presence of people, things might hold completely different meanings to non-human entities and speak differently to them: cadmium is particularly lethal to river ecosystems, so to the diatom population, cadmium might be the conceptual analogous of death, even without human association. Although we humans exercise our agency onto things, beyond-human entities' ability to communicate is unrelated to our human-thing relationships and remains uncompromised by our presence. To conclude, I will also advance that our human engagements with things influences the stories they tell to us. Due to our involvement, they speak (also) about us; our presence becomes visible in their stories. Cadmium becomes an index of human stories of pollution, of human colonization and of human extractions. We are recipients of these stories, but so are all other living and non-living entities. If we do not listen, or still cannot notice, someone or somewhat else will instead.



She is a dutch-italian interdisciplinary researcher currently based in Eindhoven, the Netherlands. Her condition of 'in-betweenness' predisposes her positioning as an outside-insider, a standpoint she utilizes for bridging the modern with the demodern. Her work is situated at the intersection of architecture, landscape, art and anthropology, disciplines she critically unbuilds by uncovering the colonial entanglements and the ramifications of Modernity. After graduating in Architecture at the TU Eindhoven in 2016, she is currently enrolled in two postgraduates programs: the second year of DAAS at the the Royal Institute of Art (KKH) in Stockholm and Cultural Anthropology and Development Studies at the KU in Leuven.

Steffie de Gaetano

support the research by visiting:

www.steffiedegaetano.net

[@steffiedegaetano](https://www.instagram.com/steffiedegaetano) | [#thepermeanceproject](https://www.instagram.com/thepermeanceproject)

