THE LURE OF PEDOGENESIS.
AN ANTHROPOLOGICAL FORAY INTO MAKING URBAN SOILS IN CONTEMPORARY FRANCE

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We desperately need other stories, not fairy tales where everything is possible to pure hearts, to brave spirits, and good wills united, but stories telling how situations can be transformed once those who confront them manage to think them together (...) It isn’t about building a model, but about practical experience. Neither is it a matter of converting us, but of repopulating the devastated desert of our imaginations (Stengers 2009, 118 my trans.)

The weather is clear but cold on this mid-winter morning, as I am walking in the streets of Paris, wrapped up in a thick grey felt coat. In my right hand, a spade swings to the rhythm of my steps. My left hand holds firm around lump of dirt. As I pass in front of the large porch of a car garage, I stop walking to examine the dirt in the palm of my hand. With a finger, I move it around and feel its texture. I then bring my hand to my nose, and concentrate for a while on the scent of the earth. Artist Anais Tondeur, holding her camera, raises a hand and sends me a sign to move forward. Meditatively, I bring the lump to my pocket and resume my walk, trying to follow as closely as possible the transect we have traced across the map of Paris, choosing between streets which will keep me close to this arbitrary line to which we have committed. I am not sure who the man I am acting exactly is – maybe a chemist, a painter or a poet. I prefer not to pin him down too precisely just now as I walk. But through him, I am in search of a fleeting, uncanny substance: the *petrichor*, the smell of the soils of the city. As a neologism to name the smell of soils after the rain, ‘petrichor’ was invented in the 1960s by two Australian chemists, Isabel Bear and Richard Thomas. It links two Greek words: *petra* (rock) and *ichor* (the blood of gods, or essence). In their paper, Bear and Thomas (1964) argued that ‘the nature of argillaceous odour’, so familiar to walkers around the globe, emerges in a complex system of interactions occurring between rainwater, the soil and its host of microorganisms. However, these scientists were not well understood. Perfumers, for instance, tried to mimic the smell of the soil
after the rain, as many believed that the petrichor was an inner quality of things, a substance intrinsic to them. Yet, petrichor is not an ‘it’. It can only emerge in the between, in the close relationship between soil, climate, and a ‘smelling human’. Anaïs and I were interested in this ambiguity. To us, as a smell that grows in intrinsic relation with things, it has the power to lure us into a processual understanding of urban pedogenesis.

Fifty metres further along the way, I walk past a rail track. I look around and start digging, feeling the coarse, gravelly soil under my spade. The metal squeaks against the stone. The earth is packed, and it resists the blade’s movements. Soon I reach a layer of a different colour. I wonder: could there be pockets of air, fermentation pouches or gas reduction forming in the furnace coincidentally set by these materials? The more I dig, the more I get carried away by the game, and the clearer my character’s quest becomes to me. As I animate the Digging Man, he starts animating me as well. I begin to get a different feel of the soil’s substances, as, thinking of our brainstorms with Anaïs, I try to perceive soil in a mode where everything is in relation. I remind myself of alchemists and 19th century doctors, and think that only through these relations between myself, soil, water and air can a smell emerge. What do they become as they bundle up in the experience of my search for petrichor? I kneel down and carefully extract another lump, which I bring again to my nose. This is not it, not yet. I resume my digging more nervously. The more I dig, the more water appears in the hole. The dusty spade gets splashed by a thick, light brown liquid. Like the Homécourt diggers, or the geotechnic lab technicians I have been following on fieldwork, I pay attention to the sound of the digging, which becomes deeper and more hollow. Soon, I pause to extract yet another lump. The musky smell is unlike anything I have smelled before. Could the petrichor finally be close? I am no longer even sure of what I am smelling. Still hesitating, I throw the lump into a plastic bag and desperately move on. As the rain starts to fall, I return with Anaïs to our improvised laboratory to distil the samples we have just collected. Who knows, maybe the petrichor will reveal itself this time?

This extract describes the shooting of a short film on which I worked with the artist Anaïs Tondeur, a ‘soil fiction’ in which I acted the role of the Digging Man.
film is part of a larger installation called *Petrichor: the smell of Paris soils*. The installation works as a triptych, and shows the film, a hanging installation of fifty two flasks of soil distillations, and a series of maps hanging at the disposal of the public. The video is projected on a wall, as a soundtrack plays the rustles of the shovel in the grounds intertwined with the digger’s thoughts on the anosmia (loss of the sense of smell) of his contemporaries. It was part of the exhibition *Soil(s) Fictions*, the temporary result of a seven-month residence at the departmental Domaine of Chamarande, near Paris, in which I participated between September 2015 and March 2016.

*Figure 24: Pétrichor, installation at the Soil(s) Fictions exhibition, Chamarande, 2016 (photo by Anaïs Tondeur)*

**The Chamarande Lab**

Why did I decide, at one point during fieldwork, to seek to collaborate with artists? As I explained in the introduction, in the first six months of my fieldwork I had been doing fieldwork mostly with scientists. I had approached fieldwork in a rather
classical way: as an ethnography of scientific knowledge practices. While doing this for several months, I had come to understand much about such practices: how, for instance, scientists were able to ‘translate’ the world into the categories of science, to mention the work of STS scholars such as Bruno Latour in such early works as *Science in Action* (1987) and the chapter on sampling the Boa Vista forest and circulating references in *Pandora’s hope* (1999). The more I was doing this however, the more I realised that these understandings had little to say about soils. The ethnography I was producing would have been very similar had my informants worked on very different topics. It seemed as if a methodological attention to the practices of scientists in labs somehow flattened out the specificity of these practices in relation to soils, making them appear as general ‘lab practices’. This posed an important question: I was interested in how the soil sciences were changing through their adoption of more explicit practices of making, moving away from approaches centred solely on field description and the cultivation of detachment. However, I was myself merely describing their practices, and did not engage directly in any kind of deliberate making. The ‘trial of fieldwork’ – to use an expression I have elaborated on in the introduction – thus brought two important questions to the way I had originally approached it. Firstly, soils themselves seemed to be all too absent from my ethnography: although I was learning plenty about them, I did not know where to fit them into my fieldnotes. Secondly, experimentality was absent from my practice, while this was precisely a boundary that the scientists I worked with had eagerly crossed in theirs.

I now feel that in this observation lay the main lesson I drew from fieldwork. I realised that I could perhaps produce other accounts and literally make things more interesting if only I could experiment with soils and ways of knowing them myself. I started to toy with the idea of experimental research methods largely because of what I had learned from the scientists with whom I had been doing fieldwork. This brought me to multiply my field sites and to approach the gardeners and geotechnicians I have mentioned in chapters 5 and 6. It also led me to develop projects of collaboration with artists.
In July 2015, I took part in the early meetings of a common project with two artists, a soil scientist, a geographer and another anthropologist. All of us were involved for slightly different reasons, but we wanted to develop a collective experiment that would take the form of a residence – officially called Laboratoire de la culture durable (laboratory of sustainable culture), henceforth the Lab – followed by an exhibition. This is the experiment through which Petrichor emerged, along with five other collaborative – or ‘soil fictions’ – which will be introduced as vignettes throughout this chapter.

Contemporary attempts to bring together art, anthropology and the soil sciences – such as those exemplified in Landa and Feller’s (2010) Soil and Culture, or in Adams and Montag’s (2015) Soil Cultures – are mostly concerned either with analyzing representations of soils in art, or with using art to better communicate a scientific concern for the importance of soils. In the Lab, we found that by being concerned with cultural or artistic ‘interpretations’ of soils, these accounts tended to repeat a boundary between hard and ‘sensible’ knowledge of soils, between knowledge and art, and between facts and values. In contrast to these examples, we wanted to develop an art-science collaboration in which art would not be reduced to a medium to transfer scientific knowledge or to ‘bridge the communication gap’ (Toland and Wessolek 2010), and in which scientists would not simply be consultants for art projects, or exegetes of them. We also wanted to depart from what Schneider and Wright (2010) identify as the focus of many collaborations between art and anthropology: a play on ‘perspectives’, ‘ways of seeing’, ‘visual representational strategies’ and ‘modes of representation’. Instead, we were attentive to Jen Clarke’s advice, to whom ‘the reconfiguration of anthropology is only possible when art is not only an object of research; anthropology with art involves a correspondence between the disciplines, thinking with art, radically’ (2015, 232 Clarke’s emphasis). We thus wanted the Lab to be a

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121 We can also note that very few soil-art projects specifically address urban soils. Compelling exceptions to this are Ellie Irons’s 2012 ‘Urban Soil Appreciation Initiative’ (http://ellieirons.com/projects/soil/), and Margaret Boozer’s 2012 ‘Correlation Drawing / Drawing Correlations: A Five Borough Reconnaissance Soil Survey’ (http://www.margaretboozer.com/exhibitions2012.html).
genuinely joint research project bringing together art, anthropology and the soil sciences, in which we would learn from each-other’s practices by ‘doing work together’ (A. Schneider and Wright 2010).

The work we did within the Lab thus followed a process of co-inquiry, in which both scientists and artists, with their own experience in different fields, participated in the framing of the ‘research’ questions towards which we worked, and then in the various strands of the research itself. We received support from the association of curators COAL, or ‘Coalition for art and sustainable development’, which helped with the organisational matters of the residence communication and the setting of the exhibition, and which was also involved in some of the steps regarding the orientations that we were taking. COAL has been collaborating with the Chamarande Domain for over a decade, and was the initiator of the Laboratory of Sustainable Culture thanks to financial support from the European programme Creative Europe and the European network Imagine2020. We were joined in some of our meetings by the geographer Nathalie Blanc, whom COAL had proposed as a ‘mentor’ for the lab, and who participated in most of our discussions and contributed many insights. Finally we were also greatly helped by the Domaine of Chamarande – Essone’s departmental centre for contemporary art – which hosted our residence and let us use its exhibition space, hosted us during our residential stay, and most importantly of all, whose wonderful staff helped us will many practical issues throughout the process.

122 2015-2016 was a prototype edition of the Lab, which might be why we were given so much leeway to follow our ideas and coordinate ourselves as we saw fit. As I write these lines, COAL is busy organising a second edition on the theme of food. They hope to organise one Lab residence every two years.
Apart from Anaïs, I already knew all the participants in the Lab before it started. Yesenia Thibault-Picazo, the other artist, had worked with geologist and proponent of the Anthropocene hypothesis Jan Zalasiewicz on her previous project *Crafts in the Anthropocene*. I had met Yesenia in Berlin, at the Anthropocene Campus organised in 2014 by the Max Planck Institute and the Haus der Kulturen der Welt, where, within a larger group, we had worked together on a paper on ‘creative experiments’ as knowledge practices (see Bhangu et al. 2016). Alan Vergnes, the soil ecologist, has been previously introduced in this thesis (see introduction and chapter 2). He is a specialist of soil macro fauna (notably ants) now based at the University of Montpellier, but previously at the Museum of Natural History and IEES-Paris – where I met him in 2013. Marine Legrand had just finished a PhD in environmental Anthropology at the Museum on Natural History in Paris on the management of urban parks. We had met in seminars and had had many discussions regarding the relation between fiction and anthropology. Finally, Anaïs Tondeur took part in the Lab thanks to our partner COAL. In her artwork, Anaïs explores hidden or forgotten details of scientific history and objects through
poetic drawings, paintings and film. She has worked on several projects involving scientists, notably the physicist Jean-Marc Chomaz, for her project *Lost in fathoms / Nuuk Island* (2014). Anaïs and Yesenia can both be said to be doing ‘artistic research’ (Borgdorff 2012). They came to the Lab with great knowledge of what academic research was, and with ideas and skills developed in previous works they had done with scientists. They both had an interest in the Sciences and their history, a great culture of current art and design, and lots of references and ideas to share. Yet they had never worked with soils before. On my part, I came to the Lab with what I had learned on fieldwork about soils, and lots of ongoing reflections on the matter. As an ethnographer, I found myself having to switch positions. During fieldwork, I had mainly been learning from people and taking notes on their practices. In the Lab, I took up the role of the ‘master’, of the one who embodied the subject matter of urban soils, and my friends often asked me questions about the history of the soil sciences or pedological techniques. I had to use the knowledge I had developed during the previous stage of fieldwork to experiment with things at hand in order to play with soils in another way. Yet, as I will explain later in this chapter, I also learned immensely from and with my collaborators and the work we produced, albeit in slightly different ways compared with other phases of my ethnographic fieldwork. Interestingly, the three scientists in the Lab made the same observation about the temporality of such an interdisciplinary collaboration. Whereas we, the scientists, felt that working on an exhibition could allow us to ‘pause’ ourselves, to take more time and make a ‘side step’, we sometimes had the impression that our artist colleagues went ‘too fast’, jumped too boldly on a hypothesis. Yet, we all learned to appreciate this other

123 The work of Yesenia can be discovered on her website (http://cargocollective.com/yeseniatp), and so can the work of Anaïs (http://www.anais-tondeur.com/).

124 The more I had been on fieldwork and learned about soils, the more able I felt to enter into a discussion with people rather than only ask questions. I do not think of the Lab experience as something I did ‘on the side of the real fieldwork’ – it is as much part of fieldwork as the rest of it. However, the fact that this experiment came only after I had done fieldwork with people already engaging with urban soils made it a different experience, slightly different from the usual way we do fieldwork. It was more akin, perhaps, to how we would think with students and colleagues in a multidisciplinary and experimental research seminar.
mode of research in that it allowed us to push a hypothesis to extreme points, to embark on real thought expeditions, as I develop later here.

Over the seven months of the residence, we gathered over five weekends, and were in touch with each other several times a week for the rest of the time. We exchanged ideas, books, papers, and discussed a lot. For me, this was truly a time in which I learned a great deal about how to do research in a prospective, forward looking and productive way. Even though only Alan, the soil scientist, and myself had worked on urban soils before, all of the participants were interested in urban nature, and in the challenges natural and social science disciplines faced before questions such as the Anthropocene. When we started the Lab we knew we were working towards an exhibition, but all the rest was open for us to develop. We had the chance to set up a short, preliminary exhibition in October 2015, which allowed us to have a first warm-up, a first run of how we might work together. We then split into groups to work in pairs or trios on developing six different soil fictions.

First soil fiction: URBARIUMS – Sketches of soil futures

Collective piece


When visitors of the Soil(s) Fictions exhibition entered the large, dark main room of the Orangerie of Chamarande, the first piece they encountered consisted of the seven terrariums we had assembled in order to explore different ‘soils of the Anthropocene’. We had thought of them as portraits of landscapes from the perspective of their soils. Yet, they were not still lives, as several of them were inhabited by worms and other insects that changed their appearance a lot in the course of the exhibition. Some were inspired by soils that the FAO’s World Reference Base for Soil Resources (WRB) – the document that describes all the different soil categories that have been accepted as such by the International Union of Soil Scientists – is currently considering for integration in its index. For instance, we built a terrarium on the suggested WRB’s edifisol category, describing the soils that develop on buildings and in gutters. Others were
projections of what the soil of a specific place might become in the future, based on the kinds of activities and projects the present holds. This first piece was a common work of all residents.

Figure 26: The terrariums being set up before the exhibition (photo by the author)

**Temporary staging of a research experiment**

The word ‘soil fiction’ refers to both the installations displayed in the exhibition and to the experience of making them. In fact, we never thought of the pieces shown in the exhibition as ‘finished artwork’, but only as the temporary stage of our research. In many ways, this research was not led by aesthetic ideals alone. It was truly a project of research on urban soils, on the ways in which we could know them, and on the conditions in which different disciplines might join in doing so. For me, the questions that the residence has posed are in many ways similar to those I have been addressing in the rest of this thesis. Chiefly, the Lab allowed me to continue exploring the question of how a different kind of relationship to urban soil could be possible, and what forms of knowledge this might require and engender. In my understanding, the Lab was a means to address the underlying questions of my thesis by other means. The working agenda was to propose a
nascent, collaborative, and speculative vision of possible future relationships that western urban culture might develop with its soils. This is the process that I will focus on for the rest of this chapter.

In many ways, my engagement in the Lab came from my reading of the recent work of Tim Ingold, who encourages anthropologists not to be afraid to move beyond description, and to ‘heal the rupture between imagination and everyday life’ (2014). It also came from my engagement with the work of Isabelle Stengers, who enjoins scholars from the humanities to restore the craft of speculative imagining to their disciplines. I shall review some ideas from the work of these scholars in order to better define the speculative imagining at play within soil fictions, consider how soil fictions might suggest alternatives to the present, and examine the ways in which they allow us to better study the conditions of life with soils.

Two themes guided this speculative inclination in the Lab. The first, in continuation with the main threads of this thesis, is that of re-opening a black box (Latour 1987), letting urban soils challenge us in other ways and letting us imagine other relationships with them. As I have shown in the rest of this thesis, urban soils are taken seriously today in more various ways than they were in the past 150 years. However, we still lack ways of talking and thinking both about and with them. More than rendering urban soils unnatural or artificial, the ‘ontology of the background’ (Sloterdijk 2013, cited in Bonneuil 2015, 38, see also chapter 1) pertaining to their sealing has allowed them to become ‘boring’, ‘banal’, taken for granted. One question we had in mind throughout the Lab was to find ways of letting ourselves be affected by them once again.

The second theme addresses the challenge that urban soils pose to science. Other chapters in this thesis have drawn the contours of this challenge ethnographically, but here we took a different approach. Rather than trying to adapt modern-day science to urban soils, we asked ourselves how, starting from urban soils, we could rethink the nature of science itself. How can we take soils seriously enough, to the point that our methods grow from the specific challenges they pose? One question we asked ourselves jokingly during the residence was what cosmology would have looked like if Galileo had looked at soils rather than the stars. Of course we did not
take this too seriously. Our aim was not to try to propose a whole new vision of the world, to say ‘the world is like that’, or to start off a new science, but rather to sketch and hold a difference. How, then, can we forge a science that would not discriminate between the world and the Anthropos, between nature and culture? Can an exhibition, a scenario or an artwork provide better ways to address urban soils, to follow their threads, and to pursue our inquiries, in more flexible modes than in scientific research? To us, it was clear that working around such open questions called for an experimental approach.

Second soil fiction: Galalithe - Taking care of the soil

Anaïs Tondeur and Marine Legrand


The piece suggests a fictive ecofeminist ritual of re-bounding with soils, by means of a movie and a synthetic cup made from human breast milk. Anaïs and Marine wanted to find ways to reconnect to the life of soils in the mode of the ritual. In our residence sessions, we had been discussing how in ancient Greece, as in many other human groups, divinities of the Earth had to be honoured with propitiatory rites in order to remain on good terms with them. For those who practices these rites, the earth was not considered as a background, or a resource to be exploited, but as something they had to care for. Anaïs and Marine wondered how they could thank the soil for sustaining their lives, and to ritually feed it with something coming from the heart of their being. Anaïs had given birth to her daughter just before the start of the Lab, and she was then still breastfeeding her – and could there be a more personal substance than breast milk to feed the earth? Anaïs used it to create two cups of galalithe – a home-made synthetic material based on milk casein that looks like semi-translucent china. Marine and Anaïs then buried one cup in a forest as an offering to its microorganisms. The other cup was displayed in the exhibition, along with a short suggestive film about its making.
A school of urban pedogenesis: suspension and recomposition

Latour and Weibel – who have collaborated on several exhibitions together – argue that in an exhibition one can do things that cannot be done elsewhere: ‘A museum exhibition is deeply unrealistic: it is a highly artificial assemblage of objects, installations, people and arguments, which could not reasonably be gathered anywhere else’ (Weibel and Latour 2007, 94). It is thus an ideal medium for experimentation. In the Lab, through our intense collaboration as artists, anthropologists and soil scientists, we, together, were the experimenters. We were makers as well as curators, and through the whole process, we explored and tried to reclaim urban soils, to bring them out of the black box, explore our attachments to them, learn about them and learn about what could constrain learning about them. We tried to work in the manner that Manning identifies as that of the ‘undercommons’, that is to ‘refrain from taking on problems that are already recognizable, available, but work instead, collectively, to invent open problems that bring us together in the mode of active inquiry’ (2016, 14). Hence, we aimed at opening possible futures for urban soils without starting from the outcomes we may want – as in the language of effectiveness, for instance when it frames soil
construction as a means to deliver ecosystem services (see introduction and chapter 1). Not starting from the ends also meant that our work would not be framed as an attempt to ‘educate the public’. Even though, as I shall explain later, we were attentive to our visitor’s reactions, the success of our experiment could not be evaluated in relation to its effectiveness in achieving ‘communication’ goals. The whole process consisted in thinking about knowledge, and developing new open problems, rather than poeticising or transmitting an existing body of knowledge.

In order to invent our open problems, the Lab worked in a way that would be both opened-ended and constrained. This is similar to the impetus of ‘following a line’ which I described in the introduction to frame this thesis. However, I wasn’t alone anymore in doing the job, since we had to learn to follow urban soils as a group. Our way to tackle this challenge was to make the lab work as a school. For education philosophers Jan Masschelein and Marteen Simons (2013), the school is not about initiation or socialisation, nor is it about ‘equipping’ learners with knowledge that will make them fit for an ‘occupation’ within society. Instead, Masschelein and Simons explore the ancient Greek notion of school to reframe it as a collective experiment in inventing a common world, in relation to the ‘new worlds’ pupils have to live with. It is a space for becoming interested, raising questions, developing free thinking, and for creating new concepts drawing on ideas from research, literature and the arts. The metaphor of the school is can also be used to describe the material conditions of our collaboration. Among other things, Masschelein and Simons insist that the school is also, for most of its time, ‘a matter of suspension’ (31). They mean this both in the sense of a physical secluded space, and in the sense that the school separates things from their normal context and brings them into a different kind of attention. The residential sessions of the Lab took place in such a secluded space: a house in a little visited area of the park of Chamarande, in which we generally wouldn’t meet any visitors for the duration of our stay. For me and the two other scientists, the residence also ‘suspended’ some of the academic constrains within which we are used to work: the perceived need to be accurate, to follow methods, to build on certain kinds of
scholarship, to render our work in a written form. Even though representatives from the association COAL came to spend time with us, their comments were far from constraining, and they participated in the elaboration of our ideas rather than trying to set them into some framework.

### Third soil fiction: An Observatory of horizons

Yesenia Thibault-Picazo and Germain Meulemans


The piece is made from thin sections of soil that the LSE in Nancy provided us with. Scientists use thin sections to study phenomena such as the aggregation of particles, but they are also beautiful objects – resembling a kind of contemporary art stained-glass window. Yesenia was intrigued by the scale that this poetic device allows the viewer to access – soils from a microscopic point of view. The thin sections were like fossils of the soil process, arrested by the hardening of the resin, but which provide a window into another dimension of soils. The LSE provided us with five such thin sections made from both industrial or constructed soils, and some microscope enlargements of aggregated particles. Yesenia then built light boxes for both the thin sections and the enlargements. The *Observatory of horizons* was a play on a technique, and on how some scientists may be affected by the aesthetics of their object of scrutiny – this aesthetics is not only reminiscent of beautiful glass work, it also draws our attention to the miniscule processes of aggregation and differentiation that are continually at play, even within the most anthropogenic of soils.
Imagination as thought experiment

How can imaginative experiments such as the Lab’s soil fictions be of interest to an Anthropology predicated on the study of dynamics and phenomena that are more-than-human? How does it count as a way of making anthropology, rather than just as art that intersects with anthropological questions? Imagination is usually understood in opposition to ‘what exists’. Calling something ‘imaginary’ is often merely a way to discredit it, to assess that it does not actually occur in the world. Imagination is also regarded as where we produce plans for action. The maker, for instance, is often considered to hold a plan of the artefact he wants to make before actually putting his hands on the material (Ingold 2013b). Imagination, in this sense, is understood as a goal-oriented activity that anticipates the future, what does not yet exist. The meaning of imagination I would like to convey here is distinct from this. It is more akin to speculation – about which I will say a few words later. In this, I would like to address how imagining the lab’s installations, and the worlds in which they took place, was a process driven by wonder. As in other creative processes, we did not know in advance what we were searching for. Furthermore, I will argue that Petrichor and the other installations

Figure 28: Close up of thin section sampled from one of Homécourt’s constructed soil experiments. Picture by LSE-Nancy
were more than *just* a nice piece of fiction. To us, they added something to the world of our entanglement with soils, and were in this sense deeply real.

As authors such as Ingold (2013a) and Carruthers (1998) have argued, the conceptual split between imagination and the world has not always existed. Authors have varying ideas as to when this split occurred – with putative ancestors ranging from Protagoras to Kant – but it has generally been regarded as one of the most prevalent features of western epistemology since the Modern age. For instance, Stephen Toulmin (1992) argues that the modern separation between the world and the imagination emerged in the post-renaissance as a means to deflate the power of opinion. For Ingold, this separation between the world and imagination has had fateful consequences, not the least for our understanding of life: ‘With our hopes and dreams suffused in the ether of illusion, life itself appears diminished. Shorn of its creative impulse, it no longer gives cause for wonder or astonishment’ (Ingold 2013a, 735). Ingold addresses this question in a 2013 journal article titled ‘Dreaming of dragons: on the imagination of real life’. He starts with the story of a monk who, in the Middle Ages, encountered a dragon as he walked out of the monastery. Ingold argues that whereas a modern thinker would consider that dragons ‘do not exist’ and are only ‘a figment of the imagination’, to medieval monks, the idea of a Dragon was also a very familiar one, as they often encountered it in their meditations. When other monks came to help their terrified brother, they did not ask whether he really had seen a dragon. This question would have been misplaced, for ‘The dragon was not the objective cause of fear; it was the shape of fear itself’ (Ingold 2013a, 736). Hence, as Ingold shows, we miss the point if we think that imagination opens up to worlds that are ‘merely’ fictive. Here, imagination is on the cusp of the world’s very coming into existence.

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125 For Toulmin, the split was mostly a political move intended to bring the upheavals of the post-Renaissance to an end. The Renaissance had seen a burst for knowledge in many directions, and multiple ways of thinking were often able to co-exist. However, the Renaissance also brought its lot of bloody quarrels over the interpretation of religious matters between Catholics and Reformists. For Toulmin, with the introduction of an ontological separation between imagination and the world, the truth of things would no longer be assessed by theological jests or armed battles, but in the peaceful and secluded space of scientific laboratories.
In many ways, the collaborative invention of fiction bears many parallels to what some STS scholars have called ‘thought experiments’. For Isabelle Stengers, to do a thought experiment is to push a hypothesis further in imagination, just to see where it gets us. It is about playing in the ‘as if’ tone, and ‘imagining a world in order to give all its consequences to a risky hypothesis’ (Stengers 2013 my trans.).

In the 17th century, scientific thought experiments were still common, and many scholars did not make a distinction between their literary and scientific work. A famous example of this are the fictions about travels to the moon that were written by astronomers at the time. As Frédérique Aït-Touati (2011) shows, direct vision did not suffice to convince the public about the new Copernican understanding of the cosmos. Astronomers had to imagine other mise-en-scène (stagings) than those provided by observatories and optical instruments. They thus invented fictional narrations meant to surpass the limits of observation and allow their readers to visit the moon in imagination. Hence, according to Aït-Touati, modern science did not readily emerge from the rejection of fiction and imagination, but the two grew in a common movement and were inseparable, at least for a while. Likewise, Claire Preston (2015) shows that in the 17th century, the writing of science was self-consciously literary. Importantly, she adds that writing fictional voyages was not only an ornament to science or a way to convince a public, but truly a part of the intellectual process. The same was true in the visual arts of that period, where there was no strict division between painting and cartography (Alpers 1983). At the time,

126 The notion of ‘thought experiments’ has been revived in recent years as a specific mode of experimentation between art, science and politics. For example, Bruno Latour also uses this idea in an interview about the Gaia Global Circus theatre project that he helped to coordinate – an experimental theatre play in which one of the main protagonists is Gaia itself, James Lovelock’s synergistic earth system. Latour further informs us that performing a thought experiment is neither a pedagogical form of science, nor a way to simply put a theory at test: it is ‘something that push[es] further what the state of techniques, theories or habits is yet incapable to solve’ (Latour 2011). For Latour, setting the Gaia hypothesis on stage makes new relief emerge and brings more flexibility to thought than if the discussion rested on the level of scientific papers. It makes it possible to nurture more hypotheses so the Gaia proposal becomes more than a true or false question, and to be given more dimensions, including political and ontological ones. And of course, as Latour argues, ‘the strength of theatre is that such a thought experiment is done in public and not just in the head’ (Latour 2011).
no strict difference could be drawn between scientific practice and its modes of expression, between discourses on facts and imagination.

*Latent science and the meditative practice of distilling*

For me, *Petrichor* was the soil fiction that best embedded our attempt to restitch imagination and the world in ways that would be consistent with questions I have been addressing in this thesis. A year before the Chamarande residence started, when I was still in the middle of fieldwork, Alan and I were already discussing possible ways to work together on a different, more sensible experience of urban soils. We thought of capturing the sounds of soils. This had grown into complicated discussions over technical details that we never resolved. At the beginning of the Lab, we set out a first exhibition that forced us to open up themes and paths to follow. Soon, we realised that what we found important about exploring soils through sound was that it seemed to allow for different modes of attention than the usual visual approach of pedological pits. As we saw in chapter 3, vision is the generally accepted sense for analysing soil samples, and is often associated with scientific detachment (Howes 1990), even though this assumption fails to register the rich multisensoriality of scientific practices.

When I started to discuss this with Anaïs, she mentioned that smell could also be a way out of vision's supposed predominance. I remembered how historians such as Barles or Corbin insisted on the importance of the theme of smell in 19th century cities, and how many urban transformations had to do with the fight against smell (see chapter 1). It seemed an interesting track to follow, and this is how we set out to work on *Petrichor*. At the beginning, we thought of ways to capture smells realistically, but this proved complicated. I recall a discussion with Anaïs: “How can we capture a smell? Under a glass bell? Maybe we should taste soil instead? Or just record the sounds of soils, it would be easier in the end?” Should we really extract, synthetize, or just suggest the smell? Does asphalt smell? How about the smell of rotting wood?
Anaïs thought we could make a film that would be like a documentary on urban smell. Modern cities had lost their smell along with their soils, so what better way to research this than digging? For this film, we needed a storyline, and the idea of a fictional scientist who collects variations of soil smells began to take shape. We were slowly moving away from the idea of presenting a collection to that of presenting a way to do research. We decided I would act as the Digging Man for the film. We would try to smell in the way we imagined the Digging Man would have done. We would use fiction in order to freely re-enact a moment in the history of urbanisation and explore how it can speak to us today.

As Anaïs and I were inventing the character of the Digging Man, we tried to think like him: how would this character, whom we associated loosely with 19th century scientists, go about in his research on urban soils? We associated him with scientists of this period because, as I have explained in the first chapter, the situation of urban soils did not seem as clear then as it later became, and it is a period during which important choices were made. The next time we met, we both brought some literature about the smell of cities before the 20th century, the history of hygiene, and the development of modern chemistry. This is when we read about 19th century scientists who attempted to capture the smell of soils, and decided to try to collect soils and see what we could extract from them by hydrodistillation. More specifically, the installation, the man himself and his methods are inspired by 18th and 19th century chemists who studied Paris muds through olfaction, exploring more particularly the ferruginous muds under and between the paving. We drew particular inspiration from the investigations of 19th century chemist Michel Eugène Chevreul (Chevreul 1854; Corbin 1986), who did research on the mud he found between and under pavements in a rather personal way. Towards the middle of the 19th century, just as the process of waterproofing the city and cutting it from its soils was being initiated as a fight against the smell of urban soils, Chevreul carried out an olfactory archaeology of urban miasma. He collected mud samples in glass flasks and let them macerate before smelling them in order to analyse how they evolve, and follow how miasma and other ‘infectious effects’ developed in them.
How this became an actual research endeavour was almost incidental: we truly got carried away by our own game. We wanted to immerse ourselves within the Digging Man's world, to give it thickness and consistency. We decided to recreate part of the Digging Man’s laboratory – his alembic, his notebooks, his maps and his flasks – as if presenting pieces we had found in our research on him. Of course, we had to manufacture these pieces as well, and this gave our *Petrichor* research yet another turn. Our meetings thus continued in an improvised lab at Anaïs’s house. For Stengers, the kind of artful imagination at play in fiction makes it possible ‘to think the future, starting from the possible that it carries’ (Stengers 2013 n.p. my trans.). Speculation, for her, is grounded in present questions – such as gender or environmentalism in the case of the novels she examines. Speculation throws a series of ‘what if’ questions and builds consistent stories around them. This invites the reader to join in explorations of other ways of living, other ways of knowing and experimenting, other complications, possibilities and openings. Stengers describes this as a craft of the imagination, where the challenge is to stitch together a risky hypothesis of today’s science with a fictive future world, in order to push it further.

Even though he re-enacted (in a very free manner) some of Chevreul’s methods, the Digging Man we invented also developed his own methods of inquiry to search for soils. We decided that not only would he dig under pavements and roads in his quest for the soil’s essence, he would also distil his samples to extract the oils which he believes produce the eagerly sought-after petrichor. Anaïs and I thus started to distil our samples, like he might have.

In a book dedicated to the invention at play in the work of Jules Verne, philosopher Michel Serres makes a distinction between the ‘patent’ and the ‘latent’ science at play in the writings of the early science-fiction writer (Dekiss and Serres 2010). In

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127 To Deleuze and Guattari, consistence is a particular holding together of separate elements. They define it as a style, a mode of ‘making visible, as Klee would have said, rather than reproducing the visible’ (1980, 422). In the Soil Fictions, we have experimented with different ‘latent’ styles, but all of them had to do with stories that had their roots in the ‘patent’ (Serres and Latour 1995) history of scientific approaches to soils or some aspect of them that had retained the attention of people of a certain period – thereby letting the story of other possible relations to soils unfold.
Verne, the patent scientific content lies in the explicit recourse to scientific ‘facts’ that the author uses as elements of his narration. In fact, Serres argues that Verne mostly read outdated scientific literature, and was far behind his time in respect to this ‘patent’ scientific content. The ‘latent’ science of Verne is harder to locate, and can only be approached in the feeling of places, entities and phenomena one gets in being carried away by Verne’s descriptions. To Serres, it is in Verne’s latent science that his true originality and invention can be found. Among many examples, Serres relates of Verne’s many descriptions of boat journeys, in which the sea is in turn in a static equilibrium, then cinematic, then dynamic and even thermodynamic. To Serres,

*these successive figures are the perfect examples of an authentic science of equilibrium. It is never voiced, never cited or explicated, always given in naïve images. No hero on board represents it, explicates it or seeks for it. Latent in the narration, it organizes its structure, works it, develops it, and produces it. Or inversely, the narration engenders this science, develops it (Dekiss and Serres 2010, 100 my trans.)*

From a patent inspiration in Chevreul’s researches, the practices we developed for and as the Digging Man were alchemical, bringing together grains, water vapour, heats and steel in an attempt to approach the petrichor.128 Our first hydrodistillations were made in an Italian ‘moka’ coffee machine. When we distilled our first sample—a patch of earth collected on a path in a park in the east of Paris—we were very careful, as we feared the soil could block parts of the moka and prevent the release of pressure, which could provoke an explosion. As the water boiled, hot vapour runs through the soil sample, taking along some of its aromatic oils and

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128 Because of its play with air, water and fire, distillation was long considered a purely alchemical practice, even when chemistry was already around. As we have seen in chapter 5, in Alchemy is not concerned with the invariant atomic constitution of elements as they are organised in a Mendeleev table, but rather with what materials do when mixed and growing together—including when involved in human projects of making. Hence, for the alchemist, the properties of materials are not attributes, they are rather achieved in the chemist’s involvement with them (Elkins 2000; Ingold 2011). Furthermore, as DeLanda argues that even in the 17th century, early chemists didn’t aim to get to the ‘principles’ of things, but rather to produce ‘substances that were close in their sensible properties to those of the postulated principles and elements’ (2015, 24). In many ways, through experimenting with ‘fixing’ referents for various substances, the chemists attempted to learn about the substance’s composition. Distillation, in this, was a mode of inquiry which equated analysis.
dissolving some of its minerals. The hot vapour then ran through a cooling pipe, and by the time it reached the top of it, it has turned into liquid again. But the liquid was not only water anymore: it was now loaded with a fraction of the soil.

We collected this liquid in a glass flask, and we started smelling it: “it smells like smoke and sewers, don't you think?” “Yes, between decomposing organic matter and shit. It makes me a bit sick...” As they settled in the flasks, the now liquid distilled soils made beautiful patterns, the result of particles in suspension, some making light coloured or golden trails, others settling in layers of smooth powder. We found the result very aesthetic, so we repeated this process 52 times. We discovered what Primo Levi meant when he described distillation as a meditative practice, seeing drop after drop come out of the pipe, carrying with it different fractions of the soil as the process continued. By the time we reached 52 samples, we had practiced a lot and had perfected our research recipe, and we had enough material for building the installation. It had become clear to us that we were researching not just the smell of soils, but the effects of the relations between humans, soil, weather and organisms. Walking the line between sealing and smell spoke to our conditions of existence (soils), their dangers (miasma), and how they became infrastructural (sealing).

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Publication: *Soilfarers*—*Absurd beings*

Marine Legrand and Nathalie Blanc — drawings by Anaïs Tondeur


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129 The writer and survivor of concentration camps Primo Levi was also a chemist. In 1975, he wrote about his admiration for the practice of distillation: ‘Distillation is beautiful. First of all, because it is a slow, philosophic, and silent occupation, which keeps you busy but gives you time to think of other things, somewhat like riding a bike. Then, because it involves a metamorphosis from liquid to vapour (invisible), and from this once again to liquid; but in this double journey, up and down, purity is attained, an ambiguous and fascinating condition, which starts with chemistry and goes very far. And finally, when you set about distilling, you acquire the consciousness of repeating a ritual consecrated by the centuries’ (Levi 1985, cited in Ball 2007, 101).
Visitors could also read and take home a collection of texts on *Soil farers*, or evocative soil organisms, written by Marine and Nathalie. The stories were poetic pieces based on their reading of scientific texts, intended to remove the mystique surrounding them by bringing them into a creative writing process.

This piece, together with *Petrichor* and another separate piece called the *Earth Feast*, also sparked off three different workshops – two in Chamarande, and one that allowed us to bring *Petrichor* to the University of Aberdeen, as a workshop on urban soils and distillation.

*How can soil fictions add to the world*

Crafting soil fictions is different from testing a hypothesis: it is rather to create an apparatus for the enactment and growth of ideas, as well as for the presentation of ideas, to make the questions urban soils pose present and palpable. As we engage in making the soil fiction, some ideas become more present and start to ‘lure us’ into certain feelings of soils. Just like the diggers, ecological engineers and gardeners we encountered in previous chapters, the ‘research questions’ that the Lab took as a thread aimed to allow space for urban soils to become interesting. Such an open-ended investigation makes it possible for new relations between them and us to grow. It helps us escape from the binary alternative between either neglect or mastery that the ecosystem services trope produces. As in digging, it is very much a process of learning to be affected. Like in pedology, many of the insights developed in the Lab emerge through digging the soil and collecting pieces of it for further scrutiny. But instead of being directed by, say, the ambition of becoming a better soil scientist, we were directed by the tracks of the characters we had thrown on the path before us. The characters and settings we invented were not only a figment of our imagination: we also had to experience them. As I shall now explain, we had thrown forth characters to lure us into a different feeling for soils.
In some of her recent work, Stengers (2013) has been examining possible links between science-fiction writing and philosophical practice. In this, like Ingold, she is interested in restitching imagination, description and theory together. Stengers is interested in how science-fiction authors imagine practical experiences to think situations such as a world without gender, or one where humans have to deal with the coming of alien viruses.\textsuperscript{130}

For Stengers, the kind of speculation\textsuperscript{131} at play in science fiction isn’t simply any ‘thinking about the future’. It is not prediction and it is not model-making. In order to ground her idea of speculation, she contrasts the ‘probable’ and the ‘possibles’ (often used in the plural form).\textsuperscript{132} What Stengers calls the ‘probable’ is something that can be entirely described given a current state of affairs; it is entirely deducible from the present and does not call it into question – it is what belongs to the domain of probabilities. In our case, the probable would be the technoscientific dream of ecological engineering to fix a dysfunctional relation between the environment and us through the trope of ‘ecosystem services’ – which, as I have

\textsuperscript{130} Stengers is thus mostly interested in the kind of science fiction that displaces our present questions by inventing worlds in which the normal and the abnormal are not the same as in our world – she notably finds examples of this in the work of David Brin and Ursula Le Guin, two science-fiction writers who follow hypotheses by inventing other worlds and forms of experience. She makes a difference between this kind of science fiction, and the kind of science fiction that thematises a linear and non-problematic technological progress, as in the style of the Star Trek series. The latter does not question the effects of such developments in themselves, and even tends to normalise it by implying that ‘Progress’ will make everything possible in the future, but only in the technoscientific mode that we already know.

\textsuperscript{131} In Stengers’s work, speculation is a way of thinking that can be both literary and philosophical. As Shaviro (2014) explains in an introductory book on speculative philosophy, this approach shares some basic assumptions with other post-structuralist movements in philosophy – such as Harman’s Object Oriented Ontology, or Barad’s agential realism. Indeed, all these authors subscribe to the idea that the world is composed of processes, not substances. Everything must ‘become’ what it is, and ‘how an actual entity becomes constitutes what that actual entity is… its “being” is constituted by its “becoming”’ (Whitehead 1929, cited in Shaviro 2014, 2). All beings – biological, technical, social, physical – grow within a relational fabric that is always singular, mobile, and cuts through all boundaries between the ‘physical’ and the ‘ideal’.

\textsuperscript{132} This latter notion comes from her reading of Deleuze and Guattari. In fact, what Stengers calls ‘possible’ is what Deleuze and Guattari would call ‘the virtual’, whereas (confusingly enough) what she calls ‘the probable’ is what Deleuze and Guattari call ‘the possible’. The basic distinction between the virtual and the actual goes back to Bergson, and the associated distinction in ideas of creativity to Whitehead (Ingold 1986).
explained, addresses the problems of modernisation with more modernisation (see introduction and chapter 1).

By contrast to the ‘probable’, the possible (in Stengers’s designation) implies creation, and it implies a resistance to the probable. It is ‘what obliges one to create oneself as capable of resisting the probable’ (Stengers 2002, 30 my trans.). However, the kind of resistance that speculating on the possibles implies is not quite equivalent to taking a ‘critical’ stance, as when the social sciences set about deconstructing some aspect of the social order. As I have just explained, the possible is creative, and in this, it adds something to the world. A truly creative possible unfolds in what Stengers calls a ‘positive mode’, in a movement that is directed at the world, not away from it.\footnote{As we have seen in the introduction of the thesis, Stengers takes her distance from the critical overtone of much contemporary social sciences and philosophy, and tries to specify the kind of hopes that speculative thought may conjure up. She explains that a speculation that is against the world, working in a ‘negative mode’, dreams to remove something from it – class oppression or gender inequality for instance. To the contrary, ‘a speculation is “for the world” when, far from removing anything, it adds, it takes the risk of a possible, a supplementary dimension – and this supplementary dimension will be called relevant if it makes it possible to pose questions slightly differently, to shuffle the issues at play, to complicate positions’ (Stengers 2002, 30 my trans.) In other words, it is about reclaiming things rather than critiquing them. It is about recovering and reinventing rather than debunking. Erin Manning adduces very similar arguments against critique in her most recent book The Minor Gesture (2016). It links to Masschelein and Simon’s (2013) argument about exposure – which is not taking up a position for or against anything but being pulled out of it.}

The move by which perspectives are multiplied is political in the sense that each play on the possibles questions the authority of what is supposedly ‘given’. It provides ways to overcome dualisms between objective knowledge and critical thought. It makes us feel (as in ‘it affects us’) that other relations with the world are possible. Within the Lab, our fourth soil fiction, titled Biomining or the Earth Harvesters\footnote{An installation by Yesenia Thibault-Picazo, Germain Meulemans and Alan Vergnes (http://cargocollective.com/soilfictions/Biomining-or-the-Earth-Harvesters).}, brought us to stay as close as possible to the tension between a probable and a rather stranger possible. The piece addresses the ethics of phytomining – the extraction of metals and chemicals from polluted soils by plants, as developed for productive uses.

In this soil fiction, the probable is of course the dream of the proponents of biomining, who rely on the capacity of certain plants to store some minerals and
chemicals under certain conditions, and hope that biotechnologies will make it possible to use plants not only to remove toxic substances from contaminated soils, but also to re-use the minerals and chemicals thus extracted. The future plants that Alan, Yesenia and I invented could be a resultant of this scenario. However, as the film shown near the plants suggests in glimpses, these plants may also be the result of their own evolution under extreme pressures from a toxic environment. In this possible, as the film shows, cities would have been abandoned to leave space for post-apocalyptic landscapes. They would still store minerals, which could be collected, but the film lets the visitor imagine the life of these humans of whom he only sees the hands. The city would have become a mine, indeed, but at what cost? When working on the installations, we called this other scenario ‘the crumbs of progress.’ The Earth Harvesters thus rather directly suggests the hesitations and different futures that the present carries – making reference to pollution, biotechnologies, and the notion of the appropriation of nature.

*Figure 29: Yesenia setting up Biomining or the Earth Harvesters. Photo by the author*
Lures for other feelings of urban soils

How, then, can we not get lost in too much openness? How to frame our speculations so as to keep a link with questions of the present? One of the ways we dealt with this question was to draw inspiration from the ‘transects’ that are used in various branches of the ecological sciences in order to do our fieldwork and collect our earth samples. In forest ecology, a transect is an arbitrary line traced from one edge of a forest to the other. By walking this line, and paying attention to all the features encountered along it, ecologists can get a glimpse of how such a forest works in its different stages – from young, highly productive edges to the beeches and oaks of the deeper forest. Jan Masschelein, whom I have mentioned before, came to give a talk in of the events held as part of the Knowing from the Inside project in May 2016, when I was writing the first draft of this chapter. In his talk, Masschelein stressed the distinction between what he calls ‘protocols’ and methods. For him, a method is a process that is defined by its ends, whereas a protocol is articulated around open-endedness and exposure. In methods, as they are thought of in science, what will count as valid at the end of the process is pre-defined. Scientific methods also pre-define the standards by which results can be assessed, and what can count as objections – such as comments made by peers. Following a line – what Masschelein calls a protocol – on the other hand, is rather to take it as a discipline, a guide to how the mind and the body should encounter the world in a particular way. It is, as Masschelein puts it in his talk, a means to ‘get you away from yourself and not get you somewhere. It is not methodus but exodus’.135

Michel Serres (2015) also uses the idea of exodus in his work. He is notably committed to the recognition that several paths, or several journeys, lead to knowing. Serres is interested in the diverse ‘messenger’ figures that thinkers send on the paths of their imagination. Hence, Maxwell’s or Laplace’s Daemon,

135 Masschelein organises ‘expeditions’ with his students to various cities in order to see what they can learn from them, and to experiment with his idea of the school. As we did in Petrichor, Masschelein asks students to walk arbitrary lines from the edges of the city to its centre, where they meet and discuss their experience.
Nietzsche’s Zarathustra going in the desert, or indeed Homer’s Ulysses are all characters invented to be sent out as scouts of thought. In the words of Serres,

*When portholes and spectacles, and even the best performing telescopes and microscopes are no longer sufficient, curious people send envoys. (...) See what I cannot see and come back quickly to tell me about it (...) The author sends them to see what he could never examine closely himself. He splits into two people so that the other as his lieutenant or placeholder will write as the author in his place (2015, 151).*

Serres’s favourite examples, again, come from the work of Jules Verne, who invented many characters and transportation devices to allow him to explore the areas that fascinated him. For instance, in *Twenty Thousand Leagues Under the Sea* (1870), the submarine *Nautilus* allows the reader to view all these fascinating things from the deep abysses as if they pierced through the pages. Captain Nemo, equipped with his submarine, is Verne’s special envoy to the places he could not visit himself. For Serres, Verne thereby tried out a different way to ‘read’ oceanography, and posed the question of what to do with it. He built a machine, a vessel, to go and visit the ocean depths. But arguably, as was the case with 17th century cosmolists, it is not only his readers that Vernes aimed to take away. He also built these vessels for himself. Perhaps, in this, Vernes though like the medieval thinker that Ingold describes in ‘Dreaming of dragons’: ‘a wayfarer, who would travel in his mind from place to place, composing his thoughts as he went along’ (Ingold 2013a, 737).

In the line we followed to learn about urban soils, *Petrichor*, and more widely the exhibition, has been our vessel. We have not invented a protocol to try accurately

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136 Serre’s metaphor of ‘reading the world’ may have misleading connotations in Anthropology, but we should not be too quick in infering plain visualist connotations to this phrasing. In fact, this argument is part of a discussion of ‘legends’ as a proposal for thinking the world within certain constrains. Serre’s disserts on the etymological link between ‘legend’ as myth, and ‘legend’ as key or caption under a map, and argues that in the writings of fiction authors such as Jules Verne, myth and science are brought together to form a legend for the world. In Latin, legenda means ‘the things to be read’, and lengendo ‘how to read them’. Just like the legend of a map, ‘Jules Verne proposes a way to go: he builds a machine that allows to go and see. A submarine goes deep down in the classification of fish; a shell-ship goes around the moon; a piece or continent torn off the Earth visits the planets of the solar system (...) The “legend” prepares the voyage, and the “voyage” realizes the legend’ (Dekiss and Serres 2010, 24 my trans.).
to describe urban soils as if they were waiting out there for us to understand them. We tried to build an ‘exodus apparatus’ – to bring together terms from Masschelein and Barad – that would pull us into our inquiry on urban soils. As most people who have once attempted to write fiction know, a character always slips away from the writer. The character has to be pursued – or tracked perhaps. In this, imagination ‘breaks a trail, continually launching forth from its tip and tracing a path as it goes’ (Ingold, 2013). Just like the diggers of chapter 3, or the geotechnicians of chapter 6 who have to ‘abduct the granular’, constantly caught between the resistance of the materials they engage with and the pull of their anticipative feel for what the soil ‘has in its belly’, the writer or the speculating anthropologist has to run behind their characters and the worlds that unfold as they go, at the same time as hammering them home on the page or in the constraints of developing an installation. Imagination is always inclined to shoot off into the distance. But the research of consistence towards questions of the present pulls it back.

The line we traced with Petrichor is a guide, it is not Feyerabend's ‘anything goes’, but a series of stepping stones designed to let one encounter that which resists and puts thinking to the test. In chapter 2, we have seen that the Homécourt apparatus set a line for the deployment of events, but isn’t arresting. An experiment, in the strong sense of the term (Stengers 2011), is about bringing something out. It is thus about accepting that we do not know the outcomes of the exposure. There are no expected outcomes – why experiment otherwise? – but as in the case of Léo’s way of working with materials to build dry stone walls, there is trust that it will work, reliance on an intuition and informed judgement, and on the fact that something will be learned along the way. This is akin to what Manning, following Deleuze, calls ‘a belief in the world’. To Manning, ‘Like the world-constituting procedure, a belief in the world refuses to follow the world as given. A belief in the world is about crafting the conditions to encounter the world differently each time’ (131). With Petrichor, we followed the transect we had arbitrarily traced across the map of Paris, but we also followed the intuition that working on the relationship between smell, soil sealing and 19th century controversies around them could lead to a more ecological feeling for urban soil. These elements were our enabling
constrain, the lines we chose to follow to take us away in our speculative exploration of Paris soils.

For Stengers and Debaise, to speculate, to perform imaginative experiments, is to invent propositions that work as ‘lures for feelings’. The word ‘feeling’ should be understood altogether as a sensation, a mind-set, and an act of feeling – it is what I have called ‘a way of being affected’ in chapter 3. In Debaise’s understanding, each well-constructed proposition or apparatus acts as a ‘lure for a feeling’. It becomes something that exceeds the event it refers to and is thus able to attract experience, to make us feel the ways in which the world could be different.

In our soil fiction, the man does not find the smell. At the end of the film, the rain starts to fall, and instead of observing how it comes into play in the sensorial ecology of the site, he walks away to seek shelter. Like modern urbanites, he keeps thinking of soil and weather as belonging to different realms, and fails to sense what the petrichor should have attracted his attention to. Yet through his explorations, he has sharpened his awareness of the realm under his feet, and has made hundreds of serendipitous discoveries. In coming so close to the city earth, he has even come to perceive the mutation in which our societies have become anosmic to the earth, when we started covering soil in concrete, exporting decomposition to the outskirts of the cities, and confining waters to the subterraneous hydraulic network. He develops a more ecological feeling for the city through an attention to its soils. This, we argued, makes him doubt. It makes him feel there might be more out there than well-formed surfaces, and that the world is less one of substances than one of co-emergence. Just like the Digging Man, as Anaïs and I were working on his story, we also discovered many things about soils. We, too, were moved by the story we were making up, and felt as if these soils began to pose more questions, to become graspable in richer ways. We now had lots of discussions about them, their fate, and ours as we cut ourselves

137 This notion derives from Stengers and Debaise’s reading of the late work of Alfred North Whitehead. In his book The lure of the possibles (FR: L’appât des possibles), Debaise (2015) reads Whitehead as a ‘speculative empiricist’, based on a particular interpretation of Whitehead’s notion of ‘proposition’. Debaise gives importance to one particular understanding of Whiteheadian propositions as ‘lures for feelings’.
from them. In many ways, this was an exploratory and transformative process that was not unlike that of fieldwork itself.

Our experiment with Anaïs Our focus on smell, of course, isn’t innocent, since smell was precisely at the roots of hygienists’s fight against urban soils. As is the case with digging (see chapter 3), learning to smell is to notice subtle contrasts, to be able to register more things in the world – and this is done precisely in a domain which early modernity has obsessively strived to wipe out of urban experience. Learning to smell petrichors rendered us attentive to urban soils in new ways. Furthermore, smell is not located in what we breathe (like something that would be ‘produced’ by the environment and that we would then detect) but in the process of our breathing in (see Ingold, 2011, 129). To Ingold, in breathing, body and world come together. As Gruppuso (2016) notes, it isn’t a process whereby we ‘interact’ with the world, but one whereby we ‘correspond’ with it. We could here take Deleuze literally when he explains that crafting fiction is a matter of conspiring with the world:

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\textit{the author makes a world, but no world awaits him to be created. Neither identification nor distance, neither proximity nor remoteness, as in either case, we would be back to speaking for, or instead of... The aim, to the contrary, is to speak with, to write with. With the world, with a portion of the world, with people. It isn’t a matter of conversing, but of conspiring (Deleuze and Parnet 1996, 66 my trans.)}
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Conspiring with the world means that learning to be affected adds to both the learner and to the world, as we hinted at in chapter 3. As Masschelein and Simons (2013) argue, learning implies an extension of the lifeworld, of what can be perceived in meaningful ways – what they identify as a ‘reinforcement or extension of the ego’ (45) – but it also ‘informs’ the world. What is learned (smelling and distilling) and what is learned about (urban soils) ‘shares something with, the existing world (and in this way adds something to the world and widens it)’ (46). That is, it ‘becomes part of the world in/by which we are immediately involved, interested, intrigued, and thereby also something that becomes an interesse (something that is not our property but that is shared between us). We could say that it is no longer an (inanimate) object, but a (living) “thing”’ (46). This is similar
to an argument made by Latour, to whom learning to smell produces both the
smeller’s body and the smelled world. Petrichor formed us as students of soils, it
became something that made us think and practice, and it also added to what
urban soils are.

Similarly to what fieldwork does to the ethnographer, this collective experiment
changed us. It entailed a ‘recomposition’ of ourselves (Noë 2015). The Lab worked
as a space where we learned together to be affected by urban soils. Its only goal
was to make us think, and to get us out of our disciplines by following a thread
together. In this sense, it did not aim to stitch different bodies of knowledge
together, but to invent other ways to be scientists, artists, citizens, humans.

Hence, the point of departure of soil fictions is not a description, a critique, or an
explication of some sort. Each soil fiction is about giving importance to a situation
and determining what will be the constraints, what will require thinking.
Developing diffractive apparatuses like Petrichor – or the dystopian story of the
Earth Harvesters – is a means to our relation to urban soils present in other ways,
to feel the fragility and contingency of its history, and to develop a feeling for the
possibles that inhabit it. Hence, these ‘figments of the imagination’, these ‘as if’
propositions bear, on the constitution of our present world – which is in the
making, held up in hesitation (Debaise 2015). They are an experiment on
potentialities so things become graspable in new ways. As our ways of imagining
and telling the world constitute lures for change, we become more attentive to the
processes at play and of the choices that were made to attempt to cut these
processes.

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138 In Latour’s words, ‘It is not by accident that the person is called ‘a nose’ as if, through practice,
she had acquired an organ that defined her ability to detect chemical and other differences.
Through the training session, she learned to have a nose that allowed her to inhabit a (richly
differentiated odoriferous) world. Thus body parts are progressively acquired at the same time as
‘world counter-parts’ are being registered in a new way. Acquiring a body is thus a progressive
enterprise that produces at once a sensory medium and a sensitive world’ (2004a, 207).

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I want to finish this chapter with a note on the exhibition itself, and how it contributed to make urban soils present to other people. At this stage, the Lab is over, but the soil fiction experiments continues through a variety of temporary expositions and workshops that the group carries on as a collective. It is thus difficult for me to draw conclusions on what meeting the public does to the experiment, but some temporary observations can be made. The Soil(s) fictions exhibition was open for two months, three days a week. Besides the different workshops, opening and closing events were organised for us to meet the public. When the exhibition was open, a mediator from the Domaine de Chamarande was present in order to answer questions from the public. Interestingly, the tinkering that took place as we were developing the installation also became infrastructural once it became visible for the public. The last few days before the opening, all our work reached a temporary state of closure in which we gradually started to
concentrate our ideas into one, precise and clear installation. During these days, Anaïs concentrated mostly on polishing the work, on making sure the lighting was right, that the film was well projected, that all the strings that held the flasks in our installation were of the right length, and that knots and pins were not too visible. We joked that this was the moment when my skills as an anthropologist became useless, as I became an assistant at the order of the artist’s ideas, bringing her the tools she needed or helping carry things around. This is when Petrichor became what Anaïs calls an ‘artistic proposition’. Just as a writer wants his reader to concentrate on the story, and not on the pins that hold the book together, she wants the visitors to concentrate on the ‘proposition’ made by petrichor and not on the tinkering and unfinished aspect of the installation. The polishing, by directing the attention away from certain things, makes the installation become something more as it comes to embody not just a collage, but a story that can be presented with consistence. It is the moment when the nuts and bolts that hold the work can be forgotten, so the visitor can believe in the fiction – or in the words of Yves Wikin (2002), when the visitor willingly suspends her disbelief, temporarily forgets that this is ‘just some distilled stuff’ and lets herself be ‘enchanted’ by the work. However, every time we re-exhibited Petrichor, we took it as an occasion to go back to the tinkering phase, to the level of the inquiry, always re-exploring our work in different contexts.\footnote{After the Soil(s) Fictions exhibition, Petrichor was shown again, in a different configuration, at the ‘Nuit Blanche’ in Paris in September 2016. Two workshops were also led with students in two high-schools in Paris region, and with the Centre Georges Pompidou. In these, students produced new Petrichor installations, and put up an exhibition. One workshop was also held at the University of Aberdeen in May 2016. Anaïs and I are now exploring side aspects of Petrichor within a project on Alchemy, and another one on the sealing of agricultural soils.} The relation between the inquiry and the exhibition should thus not be seen as one going from a lively process to that of a (dead) finished object, but as a continuous process of ‘serial closure’ (Gatt 2010) in which our soil fiction was temporary solidified before being re-opened and re-explored.

This re-exploration could also be initiated with a new look on what we had produced, since our visitors sometimes understood the installation in different ways than we had imagined, and that these other perspectives also contributed to our inspiration. As Rajchman (2009) commented about Lyotard’s exhibition Les
immatériaux that Lyotard’s aim ‘was not to display objects, but to make visible, even palpable (and so ‘present’) a kind of ‘post-industrial’ techno-scientific condition, at once artistic, critical and curatorial’ (2009, n.p.). Yet, Rajchman explains that to Lyotard, like good science, an exhibition-as-experiment should attempt to put things at risk. Hence, our visitors’ reactions helped us to see more in our work than we originally had. When Loïc, the curator of the exhibition, encountered the piece, he commented that what had struck him the most was that “whereas people commonly think of soil as solid, as gravity, this installation is aesthetically airy, like when you address smells”. What most intrigued Loïc in our installation was how ‘lofty’ it seemed, while we were addressing soils and the ground. To Loïc, this suggested a shift in perception about what we consider to hover in air and what we consider to lie still underneath us, and this is where he found the work most interesting. Some visitors also said the flasks made them think of perfume bottles, others of a lab. Many said they wish they could have smelled the content of the flasks – to which we simply replied they had to imagine it, or that the Digging Man himself had failed to pin down the petrichor. Other people were rather hermetic to it, and told us that they would have appreciated to receive more ‘explanations’ about what they were looking at. One simple explanation I often gave was to explain what petrichor meant, and then describe the installation as a collection of Paris’s petrichors.
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