

Queen Mary University of London

A View of Things to Come

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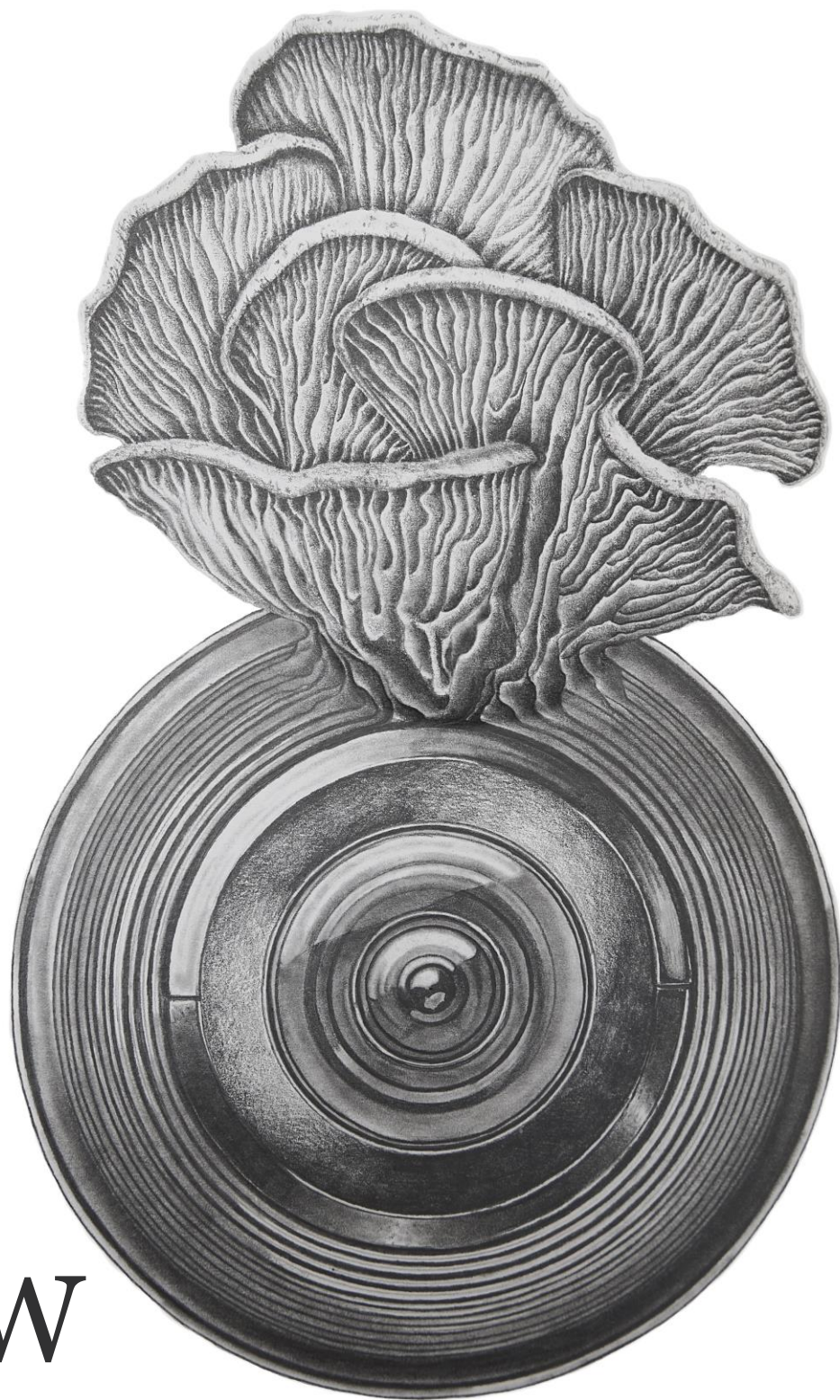
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* Parts of this PhD have been previously published in shorter forms: chapter 2 as 'Weather as cinema'; chapter 3 as 'Plant-Filming', 'New Growth', 'How to Look at Plants', and 'Permacinema'; chapter 4 as 'Strip Mining'; chapter 5 as 'Weather as cinema' and 'Media of Devotion'; and chapter 6 as 'Media of Devotion'. See bibliography.



A
VIEW
OF
THINGS
TO COME

CHRIS DYMOND

You suffer because,

like the sensation of burning on the skin when one touches a hot kettle,

you have sensed something real.

(Alex Pheby 2020: 312)

I suspect that the human species—the only species—teeters at the verge of extinction, yet that

the Library—enlightened, solitary, infinite, perfectly unmoving, armed with precious

volumes, pointless, incorruptible, and secret—will endure.

(Jorge Luis Borges 1998: 118)

ABSTRACT

A View of Things to Come explores how bacteria, fungi, and plants can produce cinematic art, with or without us. I approach these beings as artistically and pedagogically insightful companions, interrogating, rethinking, and stretching cinema through bacterial, fungal, and vegetal forms of consciousness. Analysing biological phenomena (e.g., biofilms) alongside media co-produced with bacteria, fungi, plants, and even weather, I challenge traditional concepts of consciousness and cinema as exclusively anthropogenic phenomena whilst articulating all beings' non-exceptional ability to express their subjectivity. I do not render beings' differences insignificant. Rather I exalt beings' differences, mutual dependencies, and individual gifts. I advance terms by which cinema can be explored through bacterial, fungal, and vegetal interventions, and delineate the conceptual and material parameters of a justifiable film practice, which can never fully exist. If cinema requires consuming earthbound materials, how can we justify its continuation amidst accelerating climate crisis? Furthermore, I propose the option, perhaps necessity, of the cinema industry's abandonment, whilst exploring the existence of film practices that might exist in perpetuity or, alternatively, post-industrial scenarios, alongside the possibility of cinematic experiences in the absence of anthropogenic paraphernalia. I subsequently intervene in critical plant studies, and debates concerning cinema's materiality and environmental impact.

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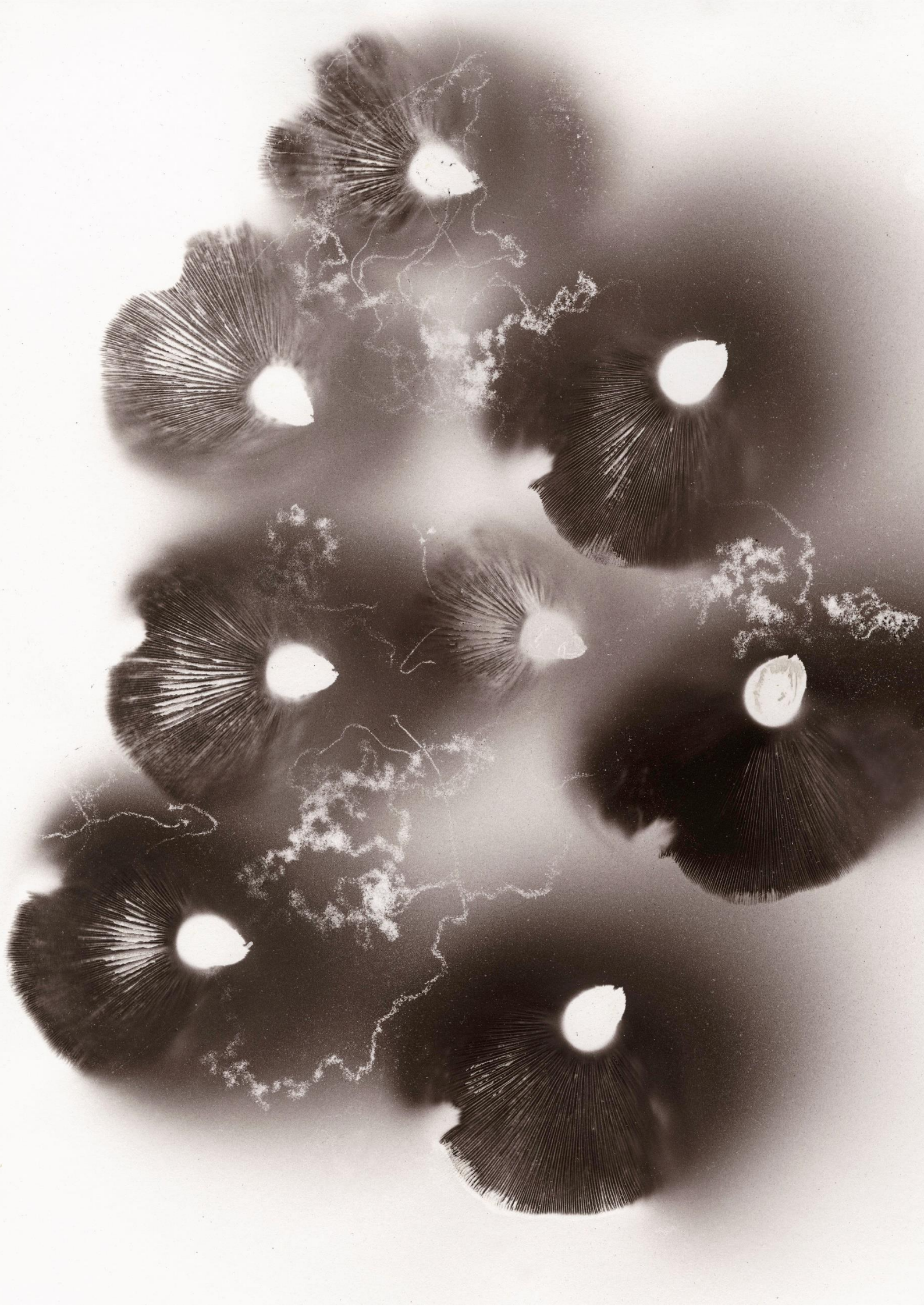
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My mother always believed in me, even when I didn't deserve it. My brother is my role model.

Finally, for Evie, my everything, always.



On previous page: Fig. 1. *This is Your Hometown* (Evers 2019).

Image courtesy the artist.

You have wakened not out of sleep, but into a prior dream, and that dream lies within another, and so on, to infinity...

—Jorge Lu s Borges

*I know a woman who makes art from mushrooms,
sets the spongey caps, broken from her wooded yard
against paper and waits. The dropped spores build
a reverse image—faade of the fruit itself, delicate
sepia tone copy she sprays with fixative, frames.*

Aren't mushrooms already art?

*Blooms of fleshy color, unexpected divas singing
in skirts of vermilion or tangerine from the dim
vault of the earth, or fluted white wings alight
on dark bark suggesting everything
from the mysteries of the deep sea to the lover's tongue.*

The artist takes the variety

Stropharia rugoso-annulata—“king stropharia,”

*it's called, "wine cap," its purple-brown nobs common,
edible—marks the paper once, twice, three and four
times, lifting the same mushroom, setting it down
again, creating repeated pictures that blur or fade,
revealing or hiding the fertile gills, more or less
of the shadowed hood – reflections reflected,
a kind of mise en abîme, art within art within art, a term
that literally means "placed into the abyss."*

*And who hasn't been there? Hasn't felt
themselves lost in infinite layers? Set down
in the center of an unending chaos that divides, alters—
who we thought we were covered over by another us
we almost but don't recognize? Am I the woman
clutching her womb, sobs haemorrhaging from her throat?
Who is the child staring with my eyes, her father stolen
from this world?*

*Which is why I buy a print called "This
is Your Hometown," eight images from one fungus,
changing and ghosting itself to prove there is always more,
life rumbling over us, the self—its many versions.*

*The double haunts.**Turning to see ourselves looking back, we think**our minds gone. Yet why should it be so? The mushroom**is nothing if not about multiplying, all those**microscopic seeds flung to willing substrate, or,**as the case may be, the paper below.**—(Kathryn Petrucelli 2020).*

I begin with Madge Evers's image and Kathryn Petrucelli's poem because there is a quality to Evers's image, exposed by Petrucelli, of entering an abyss. Another, from my perspective, concerns the relationship between viewer and viewed. Do we gaze at something inert—or return a look? The mushroom's architecture, printed like this, represents a lidless eye of intense illumination. How can we think, let alone speak, of fungal perspective?

One mushroom, duplicated eight times, finally disappearing, morphologically recalling a camera's lens. The little squiggles indicate other beings' (worms, beetles, bugs) fugitive footprints, as they fled the uprooted—deracinated—mushroom. This image literally and metaphorically scans as a battery of apertures, itself capable of facilitating expansive views, or blocking transformative thinking—multiply interpretable as a portal into other spheres of experience, or artefact designed for human-centred self-contemplation.

Apertures are features of mammalian eyes and photo- and cinematographic cameras, determining how much light impacts the image plane. Apertures expand and contract, ambivalent phenomena of welcoming and blocking, simultaneously capable of achieving both. Cinema expresses this duality, reflective screen and open window. The cinema can offer a mirror, reflecting views, perpetuating feedback loops. It can also offer a window, facilitating transformative styles of gazing, generating sightlines into new frontiers, some perhaps otherwise unimaginable.

How might we render cinema wholly open, so that everything is let in? This regal mushroom—king stropharia—manifesting in a phantasmatic mise en abîme, invites us to investigate cinema's duplicitous powers, besides a branch of cinema which flourishes within the frame, or simply pre-exists the interrelated acts of framing and capture.

After all, aren't mushrooms already art?

§ 1

APERTURE**A VIEW
OF THINGS
TO COME**

*But poets, artists, make a slit in the umbrella, they tear open the firmament itself,
to let in a bit of free and windy chaos and to frame in a sudden light a vision that appears
through the rent.*

(Gilles Deleuze and Félix Guattari 1994: 203)

I am captivated by how cinema can thematically sustain life whilst materially eviscerating it. How can anything literally destroy or conceptually support something as nebulous as life? By dismantling or perpetuating the conditions required for earthbound life's continuation. Terribly, perhaps fantastically, cinema can do both simultaneously. I begin with 3 convictions: (1) cinema's lifelong relationships to colonial and extractivist industries, evidenced by reliances on finite/organic materials, render cinematic media and paraphernalia (motion capture technology, projection equipment, substrates, etc.) inescapably destructive; however, (2) through cinema's materiality a non-anthropocentric power specific to cinema can be activated and/or acknowledged; consequently, (3) whether artefacts are entirely deleterious or partially salvific comes down to numerous facets, like (but not only): how artworks are produced, circulated, or archived; artists' methods and goals; and the relationship between viewer and screen. My research questions stem from these views:

- To what extent could cinema be conceived as more than only anthropogenic?
- How, and to what degree, can cinema help explore more-than-human forms of consciousness?
- What lessons do other beings offer cinema, and how might filmmakers implement them?
- How can we ethically justify cinema production given cinema's destructive dimensions?

These are primarily answered via 3 key chapters on plants (chapter 3), bacteria (chapter 4), and fungi (chapter 5). Why this grouping? To initiate dialogue between recent investigations in the humanities and sciences concerning bacteria's, fungi's, and plants' individual and collective importance for planetary wellbeing and contemporary developments in cinema concerning bacterial, fungal, and vegetal forms of consciousness. Furthermore, I encounter these beings as artistically and pedagogically insightful companions bearing unique

contributions, drawing inspiration from animistic and “kincentric” (Salmón 2020: 21) Indigenous cultures where animals and plants have been honoured as companions, guides, and relatives for millennia. Consequently, I refer to all more-than-human beings as individual persons, related companions, and subject-agents worthy of honour. Calling more-than-human beings people, I acknowledge their sovereignty and equity, yet never bulldoze their differences.

Earlier I expressed interests in more-than-human consciousness, subjectivity, and communication. But bacteria, fungi, and plants neither communicate nor demonstrate consciousness in a traditional human sense. What does it mean to consider more-than-human subjectivity? What of plants’ internal worlds, styles of speaking, and thinking modes? Do bacteria ‘think’, at least as western people generally understand thought? From one perspective, I am working anthropomorphically, applying human-centered vocabularies and meaning systems onto more-than-human beings likely out of kilter with such structures. This strategy might appear distasteful, even articulating human animals’ supremacy. From another viewpoint, I want to demarcate a zone of transformative ambivalence to dwell within whilst investigating our profound affinities with, and indebtedness and responsibilities to, this selection of beings. Applying words like communication and subjectivity to fungi brings us to the limits of (the English) language, identifying its ingrained human-centeredness and fundamental lack of fit with more-than-human (and many human) lifeways. This might push us to engage with or generate alternative, more-than-human frameworks. Consequently, I want to expand words like ‘subjectivity’ and ‘communication’ beyond the human animal. Responding to this failure of language and thought, I adopt various Indigenous approaches to human animals’ relationship to more-than-human life. Furthermore, anthropomorphism requires clearly understanding what humanity is, and humanity (like life) remains conceptually and materially up for grabs. The limits of humanity remain, and indefinitely will

remain, physically and theoretically volatile and mercurial, simply because they are. More than a problem, this offers exciting opportunities for further connections. Anthropomorphism can force us to openly contemplate humanity's fluidity (Thank you, Anat, for sharing this idea).

Anthropomorphising plants by identifying plants' capacities to, for example, communicate through gesture can help us confront our vegetal affinities. Plants do communicate, and by communicating, do share lessons with us. Whether or not 'communicate' or 'teach' are adequate, they express, if not accurately describe, aspects of plant being. Though imperfect, they provide places to begin. Additionally, anthropomorphising plants might help us investigate how we already are, and can become more, plant-like. Consequently, my use of anthropomorphism is polemical, flagging up western vocabularies' and thinking modes' inadequacies. As human-centered words and thinking styles do not coincide with plant being, might we modify them in response to plants' simultaneous alterity and similarity? My strategy is also productive, encouraging us to consider how, if we already share points of overlap with plants, we might expand on them, becoming increasingly plant-like. Why do this? Plants generally thrive in ways benefitting individual plants and multispecies communities including human animals. Plants' lives are tight-rope walks, fine-tuned over millennia, whereby cycles of growth, withering, and regeneration sustain ecologies by producing healthy environments geared towards resilience and biological abundancies. Plants are teachers and stewards, engineering futures targeted at multispecies flourishing. By noticing how plants are like us, we might explore how we are like plants, striving to develop these overlaps, eventually even becoming-plant. This procedure requires monumental degrees of care. We must retain awareness of plants' lack of fit with current frameworks of investigation and expression, whilst also acknowledging how we can never fully attain planthood. Nevertheless, I propose applying anthropomorphic

techniques so that we might responsively, and responsibly, phytomorphise. For millennia, many Indigenous cultures have addressed plants as guides, employing words like ‘teacher’, ‘guide’, and ‘person’ to do so. In such cultures, applying anthropogenic values and meanings onto plants has precipitated environmental stability and deferential relationships based on respect and even kinship—not maltreatment. Anthropomorphism does not automatically trigger destruction. Therefore, I wonder: can we wield anthropomorphic frameworks as partially defective yet potentially impactful devices for achieving non-anthropocentric connections with other beings who, by operating beyond such systems of meaning, encourage anthropocentric systems’ modification, even abandonment? Can we wring restorative juices from these faulty, maybe exhausted, systems of understanding?

Yet we must never exalt such beings’ lifeways by overlooking the fact that bacteria, fungi, and plants eviscerate as they rejuvenate, as inabilities to live without destroying pinpoint further interpenetrations between anthropic and cinematic, and bacterial, fungal, and vegetal being. Bacteria, fungi, and plants show how to live whilst taking in ways that heal even whilst requiring others’ destruction. All three lifeways contain destructive dimensions, manifest perhaps most disturbingly in the carnivorous *Dionaea muscipula*, the Venus Flytrap, capable of digesting insectoid and anthropic flesh. No lifeway is perfect. Fortunately, imperfection does not preclude the opportunity to heal—even whilst destroying. Deferentially approaching more-than-human beings for guidance poses, for us and cinema, one way forward.

Following my research questions, my aims include:

- Exploring how bacterial, fungal, and vegetal lessons precipitate more socially and ecologically sustainable film practices.
- Establishing cinema as a more-than-anthropogenic phenomenon.

- Constructing the conceptual and material parameters of a justifiable film practice.

For objectives, I will:

- Document bacterial, fungal, and vegetal subjectivity by examining key texts from related fields (e.g. bacteriology, botany, and mycology).
- Conduct empirical research with relevant figures to clarify key films' processual aspects and filmmakers' objectives.
- Produce terms to codify how bacterial, fungal, and vegetal lessons pertain to cinema, help artists embed them into practice, and help others drive related projects forward.
- Investigate artworks co-produced by various beings or forces, or made in human animals' absence.

During this introduction, I will: specify my corpus and why I chose such media; articulate my relationship to cinema generally, and experimental, hand-based practice specifically; clarify why I approach bacteria, fungi, and plants for guidance, before exploring the rhizosphere and the ruderal; and outline my methodology.

I focus on artefacts where artists subordinate process to others' styles of address and expression. For example, employing plant chemistry to hand-process film whilst synchronising production schedules to plants' organic rhythms invites investigation into whether we might 'film like a plant', a film practice attuned to planthood: hyper-local, socially and environmentally restorative, responsive to the climate crisis's urgencies. Alternatively, burying analogue film in environments of bacterial abundancy (like compost heaps) welcomes bacteria to engage with analogue film's gelatin-based emulsion, instigating modifications of content, form, and sound. Analysing local, small-scale practices, I propose the fecundity of scaling-back and returning cinema to its roots, by which I mean its status as an industry and its fundamental connection with the earth, to acknowledge the beings,

materials, and industrial energies subtending moving imagery. Moreover, cinematic media made by mushrooms sporifying on analogue film or paper invite examination of cinema as not merely an anthropogenic phenomenon, helping us approach atmospheres as media of fungal spores' dispersal and exhibition in manners comparable to analogue film. Fungi re-appear in chapter 7 through 'cineremediation', a film practice gleaned from investigating fungal lifeways and blending them with bacterial and vegetal teachings to produce a programme of ecologically and socially sustainable filmmaking. Chapter 6 redresses my complicity in expounding Eurocentric biases whilst pushing this project beyond western contexts.

Generally, the key films I analyse do not replicate anthropic perception. Nor do I analyse media primarily about, or exclusively made by, human animals, except as material for comparison. Instead, I analyse analogue film-based contact prints, plus an analogue video in chapter 3, and a paper-based contact print in chapter 5. In their materiality and specificity, certain analogue media, especially physical film, can help anthropic artists bypass anthropocentric figuration, more precisely, overcome how some western human animals perceive reality and their relationship to it. This is mechanically replicated by photo- and cinematographic cameras and generally corroborated by all facets of film production, from geological materials' extraction to form and narrativisation. "The "absolute realism" of the motion picture is a 20th-century, essentially Western, illusion", says filmmaker Stan Brakhage (1933-2003) (1963: 32). More recently, filmmaker Karel Doing similarly addresses cinema's structural anthropomorphism, explaining how lenses, picture planes, projection speeds, and frame rates are generally designed to mimic human animals' perspective. "Traditionally," Doing says, "film looks at reality in a singular way. [...] This is often described in terms of realism, assuming that our own perception is coinciding with reality" (2020: 22). I specify western because many Indigenous cultures propose alternative perceptions of time, space,

and human animals' status. Variation amongst western human animals is also ubiquitous. However, human animals all share biological inadequacies. Doing references Kentaro Arikawa and Justin Marshall, who propose that humans' ability to perceive colour pales in comparison to most more-than-human animals. Reptiles, birds, and several freshwater fish enjoy broader visual spectrums, whilst insects and even mice perceive ultraviolet light, which we cannot. Furthermore, mantis shrimp and butterflies, for example, possess up to 12 "spectral sensitivities", experiencing 'dodeca-chromatic' perceptions of colour space, which stretches or simply exists beyond our imagination (2014: 1150). Aligning with Doing, I believe that cinema can ameliorate human animals' biological shortcomings through, for example, material receptivity to plants' interventions. However, mainstream cinema generally corroborates an ideal subject's viewpoint. This ideal subject is human, and more specifically, usually a white western male. For example, Laura Mulvey, in 'Visual Pleasure and Narrative Cinema' (1975), argued that the viewing position articulated by dominant cinema evoked a male perspective, definitely not a plants. What would a bacterium's, fungus's, or plant's viewpoint even be or look like from our perspective, and how can we engage with it? Moving forward, these will become increasingly key questions. Throughout this project, I will attempt to explore how this in-built hegemony can be partially negated by working directly on film and paper or modifying video with synthesisers. More than a negative procedure, I aim to show how this permits entry into alternative regimes of experience.

Brakhage also acknowledges analogue film's susceptibility to more-than-human interventions. Any "animal might claw the black off a strip of film or walk ink-footed across transparent celluloid" (32), Brakhage says. Following Brakhage, in this project I approach cinema as a cipher where other forms of communication can be somewhat understood, and a vector where we can co-produce art with more-than-human others, comprehending similar yet distinct subjectivities. Largely operative through very different and contrasting, or even

decisively alien modes of expression and perception, multispecies communication generally requires intervening media. Human animals and bacteria express and perceive in very different yet occasionally overlapping ways. Middle grounds let us engage with each other by translating different methods of communication into legible registers. Analogue film, for example, is a physical surface infused with worldly materials, susceptible to physico-chemical transformations, possibly capable of relaying more-than-human semiosis. Bacteria can digest analogue film's organic ingredients, modifying its visual profile. Human animals can acknowledge and even creatively respond to those modifications, with film thereby facilitating a multispecies artistic exchange. Alternatively, consider plants, who signify via gesture and exchanging chemicals that are, to us, largely invisible. Cumulatively, these constitute, as forest ecologist Suzanne Simard states, "the language of plants" (2018: 201). Physical film is reactive to phytochemistry (plants' chemistry) and, when animated during projection, can accurately convey vegetal gesticulation. Doing, in 'Phytograms' (2020), contends that analogue film might enable human animal-plant communication by translating "a plant's experience of the world into an image that is legible for humans: plant sensation captured on film" (32).

This would be a 'phytogram', of which Doing's *The Mulch Spider's Dream* (2018), a case study in this thesis, is a key example. I will explore phytograms, amongst other types of media, as multispecies co-productions, and means of multispecies communication.

Phytograms introduce us to individual plants' subjectivities, helping us think about plants as not mere resources or instruments but beings enjoying lives lived uniquely and to their exciting maximum. In his film practice, Doing cultivates plants' abilities to co-produce cinematic art, enacting, as Anat Pick says of veganism, "an approach which is also a kind of retreat" (2018: 128) by gently and thoughtfully creating the conditions by which certain plants need to engage with photochemical film, then offering them the time and material

resources to do so. Phytograms are produced by ‘phytography’, plants’ style of writing (Doing 2020: 28). In them, we co-exist alongside plants without asymmetrically co-opting their sovereignty. Phytograms achieve this because they are contact prints. Contact prints are produced without cameras by placing materials on receptive surfaces then exposing them to light over time. However, illumination is not always necessary, exemplified by fungal spore prints, which can be made under darkness. Contact prints expose zones where other beings may exist contiguously with anthropic artists and cinema without being assimilated into anthropocentric systems of meaning and perception, significantly facilitated by cameras’ absence.

This thesis is partly an investigation of cinema’s relationship to reality, conceived as indefinitely plural. How can we approach this topic? In ‘Phytograms’, Doing situates his work through reference to structural/materialist film theory as formulated by filmmakers Malcolm Le Grice and Peter Gidal in 1970s Britain. This provides a fruitful entry point into examining my corpus as key filmmakers express critical engagement with media materiality and viewing contexts. As we learn through Gidal’s writing on the topic (1978), structural/materialist filmmakers want to elevate viewers from passivity to activity by exposing films’ constructedness, inviting participation in certain meanings’ production. Popular cinema, Gidal explains, establishes relationships between viewers and characters. Through form and narrative, audience members are encouraged to align with specific characters. These strategies of identification and alignment, Gidal says, demand, and possibly activate, passive spectatorship. Consequently, such strategies block viewers’ active participation in various meanings’ production. Therefore, as Doing argues, structural/materialism targets a “monolithic film industry and its striving for narrative continuity and the presumably passive consumption of its products by the audience” (2020: 23). Structural/materialist filmmakers might trigger awareness of films as complex systems of

meaningful cues by foregrounding films' materiality, drawing attention to emulsion, or splices between frames. Foregrounding such elements facilitates viewers' heightened engagement with films' production processes, not only blocking the emergence of an illusory reality but viewers' passive consumption of it (Gidal 1). As Kim Knowles argues, by doing so, Gidal hoped to foreground and disrupt popular cinema's ideologically coercive and corrupt(ing) agenda (2017: 259)

For my purposes, it is important that this is a critique of cinematic realism. Structural/materialist filmmakers instigate awareness of realism in cinema as an artificial illusion, more specifically how dominant cultures might use cinema to normalise constructed realities. In a structural/materialist artwork, Gidal explains, "The actual relations between images, the handling, the appearance, the 'how it is', etc., take precedence over any of the 'associative' or 'internal' meanings" (8). Illusory meanings which, through cinema, are posited as inherent or natural cannot take hold. Consequently, such meanings' 'naturalness', besides the practices that "*give meaning*" (8; emphasis in original) are interrogated. "As such," Doing explains, "structural/materialist film is concerned with a different type of realism, drawing attention to the artificial nature of cinema rather than the production of an illusional reality" (2020: 23). However, Gidal fails to address cinema's capacity to explore more-than-human realities. More-than-human beings and materials are perceived as building-blocks to be re-arranged for anthropic viewers' benefit. Even as Gidal strives to bring viewers into confrontation with 'film as film', Gidal is not, as Knowles argues, primarily focused on film's physico-chemical specificities (2017: 259). By contrast, Knowles contends that contemporary interventions into materialist film practice explore film's embodied qualities to manifest a felt connection between spectators and material world. Knowles critiques Gidal's theory precisely because it overlooks film's ability of facilitate a "sensuous exchange" (260). Nevertheless, structural/materialist theory kick starts inquiry into cinema as a bridge between

realities, thereby linking up with my media case studies which explore analogue media as sites of material exchange between more-than-human/human experiential regimes.

Additionally, key filmmakers generally remain not exclusively concerned with viewers' capacities to decipher works through cognition alone. This also contrasts with a structural/materialist agenda which, Doing says, "could be seen as a project that is largely aimed at an intellectual understanding of its output" (2020: 23). However, Doing continues, many structural/materialist films are themselves unable to sustain this aim, as they invite spectatorial pleasure on account of their "experiential qualities" (Ibid.). Many structural/materialist films represent abstract, rhythmic, and multisensorial or textural experiences not decipherable through vision or cognition alone. Can this element of structural/materialist theory and practice carry us beyond the human animal? Doing proposes an answer, arguing that visual experiences incorporating patterns, rhythms, and textures instead of identifiable objects might precipitate encounters capable of triggering states of awareness beyond day-to-day experience (2020: 23). Consequently, Doing continues, structural/materialist practices offer fertile entry points into exploring more-than-human experiences through cinema. Ideally, such experiences would facilitate deeper connections between different species, presumably by speculatively exploring different ways of seeing and hearing (24).

In *The Mulch Spider's Dream*, plants' physico-chemical interactions with analogue film produce visual and audible abstractions. That said, we should also note that this artwork is not abstract at all, based, as it is, on strictly material encounters. Furthermore, focusing only on this encounter's governing structure can nullify its impact. Phytograms are invitations to speculatively explore plants' unassimilable worlds: to put reason on hold, apply the brakes, and lose ourselves in imagination and fantasy. Consequently, Doing seeks to draw audience members out of their comfort zones, along strange pathways without tangible

endpoints. “The reward”, Doing explains, “is that this path is eventually more familiar to us than we might expect. [...] When you don’t know how to find your way through, a possible way forward is to simply jump into the mud” (Doing 2022, interview with author). What remains of Gidal’s ethos is that investigating ‘film as film’ leverages access to other realities.

In its focus on ‘film as film’, structuralist/materialist film shares affinities with ‘process cinema’ as theorised by Scott MacKenzie and Janine Marchessault (2019). Additionally, my key filmmakers approach creative processes as meaningful undertakings in themselves. Artefacts’ exhibition, circulation, and afterlife are significant factors. Yet artworks never truly enter an ‘afterlife’ phase. Regularly, key artists actively ‘discard’ their artworks, burying them underground, to instigate further generations. These artworks are indefinite phenomena of continual generation, endlessly underway, stretching entrenched ideas about death/life, useful/waste, and who can produce visual media to the limits. In these scenarios, filmmaking is a lively exchange between medium, more-than-human collaborator(s), and anthropic artist. How do these characteristics coincide with process cinema? In *Process Cinema*, MacKenzie and Marchessault define process cinema as “a creative tradition in alternative filmmaking that is unscripted, improvisational, participatory, and based on the manipulation of the very materiality of film” (3). Importantly, process-oriented films do not hope to replicate an anthropic reality. Therefore, process-oriented filmmakers generally avoid using scripts or prescriptive documents aimed at guiding artworks’ formation. “Instead,” MacKenzie and Marchessault explain, “the filmmaking process is replaced by a fluid integration of writing, shooting, and editing, and not necessarily in that order” (4). Many of my key filmmakers deploy a process-based approach, advancing a somewhat unrestricted process where more-than-human beings actively participate in films’ production. For example, in an interview, Doing contends that “I have tried to design my experiments so that there is room for plants’ agency” (2022). Doing’s process requires

observing plants' biological and phenomenological behaviours, generating a situation amenable to plants' methods of communication in response, and continually modifying process accordingly. Therefore, plants guide Doing's process's formation and ongoing development, even as Doing's process partly impacts what plants can do. This exchange is non-prescriptive and participatory, offering plants plenty of room to breathe—and create.

Isidore Isou's (1925-2007) *Traité de bave et d'éternité/Treatise on Slime and Eternity* (1951) marked a key development concerning process cinema. Isou carved into analogue film, scratching over peoples' faces, scoring made-up signs into the imagery, and thereby formulating, as Andrew Uroskie says, "a kind of cinematographic graffiti that feels quite unlike anything seen before in the history of painting or cinema" (2011: 32). For Uroskie, Isou's interventions were particularly significant because, instead of producing new or complete images, they disrupted the impact and stability of pre-existing forms. (Ibid.) In her book on Isou, *Off-Screen Cinema* (2014), Kaira M. Cabañas explains how Isou's theory concerning the history of cinema rests on the existence of two phases: the *amplique* (amplic) and the *ciselante* (chiseled) phases (8). How do these phases operate and interpenetrate? As Uroskie explains, the *phase amplique*—an amplifying or growth phase—constitutes a given medium's point of origination. During this phase, basic formal conventions are established, and expressive strategies are connected to thematic and stylistic principles: certain techniques of expression are generally understood to convey specific emotions or meanings. Next, the *phase ciselante*—a chiseling or deconstructive phase—challenges creative stagnation, generally coinciding with the medium's widespread subordination to fiduciary objectives. Now, critical practitioners adopt the medium's forms and modes of expression as their subject (25).

Structural/materialism and Isou share key points of overlap. For both, denying the dominant cinema industry requires returning to cinema's material building-blocks and

illuminating films' constructedness. This ostensibly destructive trajectory might actually help new cinematic languages emerge. My case studies operate in Isou's spirit, generally taking up mainstream cinema's formerly treasured and now ostensibly obsolete materials, made increasingly available following digital technology's ascendancy. Literally and figuratively chiselling into analogue media, they precipitate new encounters with forms of consciousness still largely thought non-existent, at least in the west. Furthermore, they do not chisel into analogue media alone. Plants chemically modify analogue film emulsion. Bacteria ingest and process organic materials sewn into the strip. Fungi send tentacular, explorative hyphae into strips' ostensibly uniplanar volumes, foraging for nutrients. Alternatively, mushrooms might elect to sprinkle their diaphanous, dust-like spores over the strip's surface. As *Treatise's* narrator says, "if what I produce can be called "cinema," then I deserve no merit, for it already exists. We must find out how the cinema can go beyond itself. *It's not only a matter of bringing something new into the cinema, but to open up a new road for the cinema as such*" (Emphasis added). Nevertheless, Isou understood chiseling as a political, not aesthetic, activity, MacKenzie and Marchessault explain (8). Like Gidal, Isou's objective was to disrupt spectatorial passivity, not pull focus on film's physico-chemical specificities, and certainly not film's susceptibility to more-than-human interventions.

My key filmmakers synthesise de- and re-construction, encountering more-than-human interventions beyond negative ontologies of destruction and decay. They invite multispecies inscriptions, not only chiselling strips themselves. These artworks are not about brutalising media, but exploring human/more-than-human entanglements' generative power, typifying shared existence's restorative fecundities. Privileging process over completion, they invite contemplation of cinema's synchronisation with wider, earthly rhythms. For example, spore prints, when projected, release fungal spores. These may encounter soils amenable to fungal growth, possibly producing more mushrooms, which may produce further,

increasingly elaborate or simplistic spore prints. This is a circular, processual scenario without tidy termination or beginning. Produced by placing sporifying mushrooms, gill-side down, on film or paper, cinematic spore prints operate as alternate fruiting bodies, conceptually and materially kin to mushrooms. Where do film worlds and others' lifeworlds start and end? How do they relate to each other, and how can we explore that relationship? Where do we situate the boundary separating world and screen? As we move forward, questions like these will become increasingly important.

We must isolate analogue film's and video's values, as ostensibly obsolete technologies that have been superseded by various alternatives, notably digital technology. Knowles and Tess Takahashi taught me what photochemical film offers today, most notably how its use exceeds media fetishism. Takahashi celebrates film's physicality and receptivity to physical intervention as providing "supplement[s] to knowledge accessed by vision" (2008: 50), communicating the "physical contiguity and presence between [...] world, artist, medium" (51). Knowles argues how, following digital technology's ascendancy, photochemical film has phased into a post-industrial state of heightened availability, with its continued relevance partially derived from "its unique capacity to record the indexical traces of the filmmaker's hand, as well as other physical encounters", which distinguishes analogue film products from more contemporary forms of moving image making (2017: 257). However, the matter's performativity is only comprehensible because cinema eviscerates material beings and the earth. By 'performativity of matter', Knowles, I think, not only references matter's creative agency, but matter's ability to convey—to perform—its agency by, for example, physically engaging with photochemical film to produce abrasions or signs we can acknowledge and even work with. Recent investigations have excavated cinema's proclivity to, as Pick in her presentation 'Permacinema' (2021) says, "feed on the world". Perhaps the definitive work on this topic is Nadia Bozak's *The Cinematic Footprint* (2012),

where Bozak explains how, just as so-called natural resources determine the global economy's rhythms and health, so too is cinema beholden to their fluctuating abundancies (8). Jussi Parikka is another key voice on media materiality and cinema's relationship to extractivist enterprises. In *Geology of Media* (2015), Parikka proposes other ways of conceptually and materially getting into—*entering inside*—media, precisely through the prism of their materialities and extractive relationships to earthbound energies. “I am interested in finding strains of media materialism outside the usual definition of media”, Parikka says (2015: 4). Beyond exploring only the medium or media object, Parikka proposes investigating the minerals and materials which go into producing such phenomena. Creaturely gelatin provides further pathways into expanded concepts of media materiality. Cinema's longstanding relationship to routinised animal slaughter precedes the medium's technical emergence, generally proposed to have occurred in 1895. In *Animal Capital* (2009), Nicole Shukin explains that, when the word ‘film’ was first used in a commercial context by George Eastman, it referred only to the gelatin coating applied to the paper backing (105). Creaturely gelatin—“aka animal glue” (104)—is a protein produced by boiling the often more undesirable body parts—like skin, tissues, or bones—of cattle, sheep, and pigs until a viscous ooze remains (Ibid.). This is impregnated with silver halide crystals (collectively, the emulsion) and applied to a synthetic scaffold (polymeric film, the base). During exposure, these crystals absorb light and an invisible image of the subject forms in the emulsion (the latent image). During development, this latent image becomes visible and (ostensibly) permanent. This image's emergence coincides with gelatin's withdrawal as the figurative and literal background out of which photochemical imagery can occur. Gelatin's overt yet illusive presence illuminates cinema's historical and contemporary reliance on corporeal and, in its connection to silver, geological extraction. Consequently, Shukin explains how this animal glue produced from the waste products produced during slaughter “can be excavated as one

site where the production of capitalist culture can be seen to always also involve the rendering of nature” (Ibid.); or, a tendency to feed on the world.

All cinematic production, whether analogue or digital, relies on a tightly calibrated loop comprising the extraction of finite and/or living materials to produce moving imagery in which more-than-human beings and/or landscapes (and formerly harvested materials) are represented to achieve thematic cues often (at least outwardly) pertaining to such beings’ and landscapes’ care. All media, cinematic or otherwise, succumb to this structural crisis. Parikka investigates this knot as media’s “double bind”, explaining how our connection with earthbound life is heavily mediated by technologies which rely on earthbound ingredients to produce media artefacts (2015: 12-13).

This violent reality not only includes the disassembly and perverse re-animation of creaturely bodies. What becomes increasingly visible via the complex alchemy of exposure and development is the silver suspended in film’s gelatinous matrix. And a reliance on silver is as problematic as cinema’s voracious appetite for creaturely life. *AgH20: silver + water* is an ongoing project by Lauren Bon, Tristan Duke, and Richard Nielsen: the Optics Division of the Los Angeles-based Metabolic Studio. In Artbound’s feature-length special on *AgH20* from 2013, we learn how the young cinema industry flourished on water and silver extracted from California’s Owens Valley. Bon explains how water went west, on the LA Aqueduct, built in 1913. Silver went to Philadelphia, where money was minted. Photography pioneer George Eastman (1854-1932) used this silver to develop photographic equipment and photochemical stock at his laboratory in Rochester, New York. Animal parts journeyed to Rochester from Chicago’s stockyards, also called ‘Bovine City’, where, Shukin explains, in 1893 the “moving disassembly line” was exhibited alongside “Eastman’s portable Kodak camera [...] and [Thomas] Edison’s Kinetoscope motion picture camera” as part of the World’s Columbia Exposition (2009: 93). “Across the river from Chicago’s White City,”

Shukin atmospherically explains, “in dark Packingtown, lay the spectacle of animal disassembly, the material ‘negative’ of the mimetic reproduction of life promised by the new technological media on the other side.” (Ibid.) During this brief coincidence, cinema was uncomfortably contiguous with the killing processes and organic materials it renders invisible during its own production even as it needs them to live (Ibid.).

This silver returned to LA, suspended in a gelatin-based emulsion, reuniting with the water sustaining the city growing around the incipient cinema industry. Previously, Owens Lake, in Owens Valley, was part of a series of cascading lakes. Today, it is a carcinogenic nightmare. Arsenic from the exposed lakebed whips up plumes of dust, blowing over California. Physical film speaks to corporeal, geological, and colonial extractions, Indigenous landscapes stolen and exhausted of their mineral wealth. Digital technologies are equally reliant on extractive enterprises operating in ever-increasingly fraught contexts. As Sasha Litvintseva explains in ‘Geological Filmmaking’ (2018), “Media technologies are entangled in the history of colonialism and an ever-advancing extractive frontier, from lithium mined in Chile salt flats to rare earths from Inner Mongolia” (111). I pursue cinema’s non-anthropocentric potential in sight of these observations. This project is a struggle to justify cinema’s continuation amidst climate crises partly begat, and contemporaneously accelerated, by cinema. For cinema this dilemma is not only ethical but existential. Amidst environmental collapse, cinema must metamorphose or perish. If so-called resources are entirely exhausted, cinema, as it stands, will starve—just like the rest of us. Now I offer some preliminary answers but no wholly satisfactory solutions, instead I awkwardly pinball between these perhaps unresolvable tensions.

Cinema’s seemingly inescapable inadequacy manifests as a constituent inability to not consume. But cinema is technological, not organic (although it certainly comprises organic elements), so how can it consume—or eat? Cinema ingests finite and/or organic materials

often harvested from living beings, just like other beings do when they eat. As heterotrophs, we share this shortcoming. Heterotrophs cannot produce their own food, in contrast to autotrophs, like many plants, but, for example, the carnivorous *D. muscipula*, who we will become even more acquainted with in chapter 3. To live human animals must feed on nutrients stored inside others' bodies. Veganism, as a modality of eating and style of life, helps us deny, or at least restrict, our biological needs, by limiting what we might eat based on appropriately responding to others' desires not to die. Yet we must, at a minimum, eat plants, who Michael Marder powerfully situates as the "final frontiers of dietary ethics" (2013a: 29). Cinema requires minerals held inside the earth's body, and in its photochemical form, creaturely life, too. Cinema is an industrial and ideological enterprise through which the world is audiovisually and literally captured, ingested, and regurgitated as art objects: remade, as it were, in our image(s). As we may adopt alternate styles of consumption, cinema might advance different strategies of satiation. For example, as Pick argues in 'Vegan Cinema' (2018), instead of devouring alterity, artists can acknowledge others' sovereignty by refusing to assimilate them into the self, satisfying vegan rubrics. From my perspective, this can take the form of injecting other beings into alien stories or treating them as mirrors of anthropic desire. Pick's argument, though by no means anthropocentric, remains centred on the human gazer. How can we look differently, Pick asks, cinematically satisfying vegan rubrics? I work slightly differently, exploring how we might encounter, explore, and comprehend other viewpoints through cinema. This inquiry helps identify particular more-than-human beings as instructive subjects whose lessons and teacherly capabilities might be revealed through cinematic art. Alternatively, as we, to borrow Marder's words, might "eat like a plant" by "welcoming the other [...] and turning oneself into the passage for the other without violating or dominating it" (2013b: 185), so too, perhaps, might artists film like a plant, never consuming without remainder. Although I have somewhat grazed over it here,

this investigation into cinema's gustatory dimensions, and in them, its creaturely affinities constitutes a key, guiding thread running throughout this thesis. To re-deploy Pick's questions, "Can we eat without destroying? Look without appropriating? Enjoy without acquiring? Veganism and film share some common problems." (127) Additionally, I wonder, can we justify cinema's continuation amidst accelerating climate crisis, given its seemingly inescapable inability to not eat? Alternatively, could we imagine a cinema decoupled from any dynamic of consumption and appropriation whatsoever, merely operative through, instead, the common earthly gestures of movement and time?

To tackle these questions we might consider bacteria's, fungi's, and plant's lessons, which not only contain dietary instructions but also pertain to producing cinematic art. Isolating their lessons requires articulating how they behave separately and together. Comprehending their singular and shared lessons requires examining a key zone in which they enjoy mutual contiguity, the rhizosphere.

RHIZOSPHERE

As explained by Anton Hartmann, Michael Rothballer, and Michael Schmid (2007), Lorenz Hiltner (1862-1923), after investigating different crop plants' growth and germination, proposed the concept of the rhizosphere in 1904. Hiltner argues that plants decisively impact nearby bacterial soil communities, and conversely, that surrounding soils' microbial populations directly influence plant nutrition, even determining plant products' abundance and quality. Therefore, plant health depends on shifting partnerships with microbial communities which plants help establish and perpetuate. Furthermore, Hiltner postulated the presence of "uninvited guests" who adapted to root exudates, placing limits on plants' supremacy whilst highlighting microbial agency (Hartmann, Rothballer, & Schmid 7).

The rhizosphere is a privileged theatre of interaction between my three living foci: bacteria, fungi, and plants. The rhizosphere joins the earth's surface with the bulk of the soil below, a sphere of multispecies action localised around plants' dynamic roots—a fluid, mercurial architecture, perpetually on the go. In the rhizosphere, bacteria live on or in plants' tissue, accelerating vegetal growth, galvanising pathogenic defence, or stalking and executing plants for personal gain. Fungi squeeze between plants' cells, sharing nutrients across huge distances. They siphon off their own share of food, always giving something back, even supplying highways for bacterial locomotion and vegetal communication. For example, via photosynthesis, plants turn ('fix') atmospheric carbon into energy sources, releasing up to

half into their environment, depending on their neighbours' desires. However, rather than dumping this into the earth, plants entrust it to fungi, who shuttle nutrients to others in need. (McNear 2013) Reciprocally, fungi, who can grow into spaces plants cannot and supply foods plants need but cannot acquire themselves, like phosphorous. (I use 'who' intentionally, acknowledging more-than-human personhood. As persons, bacteria, fungi, and plants must be addressed as worthy of respect, not as instruments for human-centered satisfaction.) "By partnering", explains mycologist Merlin Sheldrake, "plants gain a prosthetic fungus, and fungi gain a prosthetic plant. Both use the other to extend their reach" (2020: 130). This connectivity builds robust ecologies based on shared exchange. Inherently local, rhizospheric relations have planetary impacts, producing livable futures. The rhizosphere is a guidebook for surviving the climate crisis and making cinematic art, through practicing learned receptivity to others' needs and executing micro-gestures capable of impacting entire ecosystems.

As Sheldrake explains, the fungal body, the mycelium, is a net-like structure of wispy filaments called hyphae, each merely a single cell thick (57). Mycorrhizae (from the Greek *mykes*, fungus; and: *rhiza*, root) names the symbiotic relationships shared between fungi and plants. "Today", writes Sheldrake, "more than ninety percent of all plant species depend on mycorrhizal fungi. They are the rule, not the exception: a more fundamental part of planthood than fruit, flowers, leaves, wood, or even roots" (130). Mycorrhizal relationships occur along ecto- or endomycorrhizal pathways. Ectomycorrhizal fungi ensnare plants' roots. Endomycorrhizal fungi pierce plants' bodies, penetrating plants' cells. Endomycorrhizal relationships are symbiotically obligate, meaning neither party can live without the association. Both lifeways exemplify earthbound life's general rule: we flourish together or not at all. Around 600 million years ago, it was only through novel allegiances between fungi and green algae that either could venture onto dry land (Sheldrake 129), producing planetary

conditions amenable to terrestrial plants' and animals' flourishing. Consequently, Sheldrake argues that "Plants and mycorrhizal fungi enact a collective flourishing that underpins our past, present, and future. We are unthinkable without them" (130).

To comprehend bacteria skillsets we can investigate beans' partnership with squash and corn. Many Indigenous cultures plant corn, beans, and squash together in polycultural gardens. These plants' unity can be verified by observing their synchronised growth patterns. Corn grows skywards, lending beans vertical support. Squash splays horizontally, producing leaves which barricade hungry insects and supply organic parasols shading out competitive vegetation. Anishinabek scholar Robin Wall Kimmerer explains how, through their sympathetic, interconnecting architectures, neither a drop of water or light is wasted. In her book *Braiding Sweetgrass* (2013), Kimmerer explains how "The organic symmetry of forms belongs together; the placement of every leaf, the harmony of shapes speak their message. Respect one another, support one another, bring your gift to the world and receive the gifts of others, and there will be enough for all" (132). Kimmerer's account is aesthetic, exploring the interplay between light, form, organic rhythms, and albeit unsaid, the passage of time. It is thereby also cinematic, introducing us, if only just, to a style of cinema operative beyond industrial contexts, exclusively manifest in living beings' moving bodies as they convey significant, meaningful gestures over time, appreciable in the sun's rays as they cascade through the vegetal canopy. Light, gesture, and motion interpenetrate in this polycultural garden, making moving images without any cinematic paraphernalia whatsoever.

Kimmerer continues, saying that "The corn takes care of making light available, the squash reduces weeds. What about the beans? To see her gift you have to look underground" (Ibid.). Plants need nitrogen. Fortunately, over two thirds of the atmosphere is nitrogen gas. Unluckily, plants cannot use nitrogen in its gaseous state. Plants need nitrogen fixed, as mineral ammonia. This is one of the earth's confusions: superabundant nitrogen in an

unacceptable form. However, as Kimmerer says, beans are exquisitely adept at transforming nitrogen into a foodstuff for plants (133).

Yet beans cannot fix nitrogen. Conversely, beans produce specific conditions by which bacteria can. When starved of nitrogen, beans emit chemical signals. If lucky, a *Rhizobium leguminosarum* bacterium responds. Signaling back, rhizobia precipitate the formation of nodules in beans' roots, which rhizobia penetrate (McNear 2013). Kimmerer explains how rhizobia's enzymes fail in the presence of oxygen, and how soil is, on average, half air space. To operate, rhizobia need vacuum-sealed refuges. Beans supply an anaerobic nodule. Reciprocally, rhizobia share nitrogen with beans. In this polycultural garden, Kimmerer explains, "there are layers upon layers of reciprocity, between the bean and the bacterium, the bean and the corn, the corn and the squash, and, ultimately, with the people" (2013: 133-134). Never forget fungi, along whose mycelial roadways nitrogen ricochets and cascades. In chapter 7, reciprocity will become a constituent component of the recuperative filmmaking framework of cineremediation.

The rhizosphere provides antidotes to recent trends in scholarship. In *Why Look at Plants?* (2019), Giovanni Aloi describes "animal-blindness", naming human animals' inability to think of more-than-human animals as more than instruments or reflections (xx). Aloi is addressing a conceptual, not literal, blindness. This is not an over-sight but an over-coding, marked by a failure to acknowledge more-than-human beings as valuable beyond human animals' desires. This blindness regularly operates through sight, for looking can render others' agencies invisible. Aloi proposes that "plant-blindness" addresses plants' comparable reduction to "resources or aesthetic objects" (2019: xx). As critical animal studies kicks back against animal-blindness, critical plant studies seeks to remedy human animals' vegetal appropriations. Laura Rival (1998) and Elaine P. Miller (2002) introduced the field, whilst Matthew Hall (2011), Michael Marder (2013a, 2013b), and Randy Laist

(2013) solidified its parameters and objectives. However, such attention has arguably precipitated, Sheldrake says, “plant-centrism”, and even bacteria- and “fungus-blind[ness]” (163), compounded as we are literally bacteria- and fungi-blind. Seeing either requires optical prostheses, arguably encouraging us to identify them as phantasmatic symptoms of our consciousness. Maybe biofilms (communities of micro-organisms, e.g. dental plaque) and mushrooms are this rule’s exception. However, mushrooms are simply fungal bodies’ flowering sections, and not all fungi produce mushrooms. Moreover, biofilms only become visible when bacteria coagulate en masse under specific conditions. Furthermore, ‘plant-centrism’ is particularly erroneous because it contradicts vegetal being. Marder, in ‘For a Phytocentrism to Come’ (2014), proposes a ‘phytogenic paradigm’. Marder argues against the ‘animal turn’ (the ‘zoocentric paradigm’), which he sees as residually anthropocentric in its reliance on sentience. Turning to plants (the ‘phytogenic paradigm’), Marder claims, offers the broadest, most inclusive shift in our thinking because whether or not plants are living remains contested. But does moving from zoocentrism to phytocentrism achieve the desired result of a comprehensive conception of life? To avoid replicating the problems of centrism (rejecting both zoo- and phyto- exceptionalism) we may exalt the entanglement of all life, where nothing and everything is privileged simultaneously. Consequently, animistic and kincentric models pose more viable paradigms. Additionally, plants are not biologically centric for they do not hoard nutrients, as evidenced by their bacterial and fungal connections. Nor are plants evolutionarily centric. John Allen and John Raven in ‘Genomics and chloroplast evolution’ (2003) explain how the organelles responsible for photosynthesis in contemporary plants derive from ancient endosymbioses, when free-living cyanobacteria were engulfed by another organism. I seek to remedy bacteria-, fungi-, and plant-blindness by exploring artworks exuding fresh modalities of audiovisual expression amenable to more-than-human others’ abilities to self-represent and auto-inscript.

Ruderal vegetation further illuminate my filmic corpus's contemporary significance. *Ruderal* comes from *rudus*, Latin for rubble. As Berlin lay destroyed after World War II, plants and fungi emerged from the blasted cityscape. Sticky goosefoot (*Chenopodium botrys*), a Mediterranean plant, and the Chinese tree of heaven (*Ailanthus altissima*) emerged amongst bomb shells and brick dust, transported on soldiers' boots. Urban ecologist Herbert Sukopp, living in Berlin at the time, called these hardy pioneers ruderal, resilient and creative trailblazers precipitating life's onwards radiations. Ruderal fungi and plants appear in territories seemingly hostile to life, as Bettina Stoetzer explains, "the cracks of sidewalks, the spaces alongside train tracks and roads, industrial sites, waste disposal areas, or rubble fields." (2018: 297) Ruderal beings and communities are neither cultured nor wild, conversely depending on what Stoetzer calls an "edge effect": they thrive in the spaces between contrasting ecosystems (Ibid.).

This is the end of the world. Without radical system change the slim conditions we and many other beings need to live will shortly disappear. This automatically means we are living through the end of cinema. Or does it? Cinema's conclusion can be approached along two axes. First, the conclusion of cinema as an industry. Next, the end of cinema as we know it, precipitated by awareness of more-than-human beings' capacities to make cinematic art. The artefacts I analyse exhibit escape routes beyond cinema's literal end, whilst—or, rather, by calling us to consider others' cinematic sovereignties. They provide limit cases of what cinema is and can do, introducing the end of thinking cinematically. I explore cinema as an industry *and* a power coterminous with life, helping us contemplate how cinema might galvanise multispecies futures whilst tackling the increasingly likely prospect of a future where cinema no longer exists.

I approach my case studies and their artists, human and more-than-human, as irreverently regenerative pioneers, operating amidst blasted ecosystems of industrial hubris.

They regularly utilise the rubble materials and machinery left behind by progress's forward march, manifest, cinematically, in the digital revolution. As Knowles might say, they look "backwards in order to project forwards" (2017: 258), a ruderal avant-garde amidst eco- and technological ruins. The 'end' or 'death' of cinema has been foretold many times, its doom proclaimed in conjunction with the ascendancy of the digital and the radical diffusion of exhibition contexts, murdered by laptops and smartphones. I focus on cinema's termination in two senses. First, its industrial conclusion, primarily triggered by resource scarcity. Additionally, its conceptual end, triggered by awareness of living beings' ubiquitous ability to not only creatively impact and co-produce cinematic media, but operate cinematically beyond and before the cinema, sharing biosemiotically abundant information whilst moving in time.

Synthesising the end of cinema and the end of the world, I investigate relatively short and deceptively simple artworks made by more-than-human and human beings collaboratively producing artefacts in various media. In the flipped-out ecologies of the future, maybe this will be the cinema that continues. However, other possibilities exist.

METHODOLOGY

Métis artist and scholar Julie Nagam outlines some aspects of an Indigenous methodology for analysing/making artworks: collaboration; consulting community experts; and mentorship: listening to the stories of different stakeholders and community members (2017).

Furthermore, Sasha Litvintseva argues that “Individualism will have no place in the creative practices that seek to grapple with the ecological crisis” (2019: 18). Litvintseva also references Bill Gilbert’s ‘Modeling Collaborative Practices in the Anthropocene’ (2013) where Gilbert proposes that art can “model a new cooperative/collaborative approach that will supplant the current individualistic paradigm” (56). Alongside analysing key films and theories, the interviews I have conducted and from which I quote contribute to an empirical and interdisciplinary research strategy through which my own views might be challenged and alternate lines of inquiry revealed. Through receptivity to others’ inputs I hope to produce a collaborative methodology appropriate to the climate crisis’s urgencies.

Furthermore, I primarily deploy a ‘diffractive’ approach as proposed by Karen Barad (2007) and also adopted by Litvintseva. Diffractive methodologies contrast with reflexive methodologies. In a reflexive methodology, researchers observe an object then interrogate their relationships to that observation to acquire objective knowledge. Reflexivity coincides with reflection—mirroring—supposedly producing accurate reflections of reality. It actually produces feedback loops as investigators repeatedly reflect on their own interpretations.

Diffraction is a different phenomenon and mode of investigation. To illustrate this concept, Barad describes the results we experience when simultaneously dropping two stones into a

body of still water. In this scenario, seismic ripples fan out from each the point of each stone's collision with the water. As such waves collide, new patterns are produced, and such patterns are referred to as "interference" or "diffraction" patterns (2007: 77). "In contrast to reflecting apparatuses", Barad continues, "like mirrors, which produce images—more or less faithful—of objects placed at a distance from the mirror, diffraction [is about] patterns that mark differences in the relative characters [...] of individual waves as they combine" (81). Diffractive methodologies are appropriate when investigating earthly life's entanglement because points of overlap present productive opportunities for onwards analysis and investigation does not return inwards but rather flows outwards into increasingly complex connections. There is no requirement to resolve tensions or contradictions. Conversely, these can advance fresh insights concerning the diffracting phenomena and medium of diffraction. Nevertheless, self-reflection, in the sense of reflecting, internally, on one's behaviours and thoughts, should not be dismissed completely, offering an important methodology for self-development and even developing relationships. We must centralise individuality, even as every individual is part of an entire assemblage. A task emerges, namely recognising what situated individuals might contribute to assemblages, before altering behaviours and patterns of thinking to intensify such contributions' power and frequency. Therefore diffraction and self-reflection can be complementary. Furthermore, as Kimmerer might say, individuals successfully diffract because they offer something unique to a diffractive situation. Individuality and collectivity intertwine as co-constitutive phenomena.

Cinema is a medium of diffraction through which various beings productively coincide, metamorphosing through those connections. Exploring cinema through bacteria, fungi, and plants—and exploring bacteria, fungi, and plants through cinema—I investigate how cinema shares with these beings key aspects of its ontology. For example, ingesting light, cinema excretes imagery as a surplus. Cinema is photosynthetic, vibrating with vegetal

potencies. These resonances provide launchpads for inquiry into the character of the diffracting phenomena and medium of diffraction. Entanglements with other beings open our eyes to new perspectives pertinent to our own and others' characters, and the context of our entanglement (diffraction). Cinema's vegetality highlights a largely—not entirely—nascent option to emulate planthood; or, become-plant. Cinema's becoming-plant, as I explain in chapter 3, names cinema's possible yet only ever partial coincidence with plants. These scenarios invite us to consider how cinema might become bacterial, fungal, and vegetal whilst also begging us to investigate how cinema might introduce new ways of thinking about bacteria, fungi, and plants, and human animals' earthly status.

Following Barad, a key figure in new materialist debates, I should clarify why I do not engage with new materialist scholarship. New materialism appeared around the year 2000, quickly becoming a popular approach, yet its legacy reaches back to at least the 17th century when René Descartes (1596-1650) depicted human animals as disembodied minds suspended in bodies of brute, inert matter. For Descartes, more-than-human animals were robotic automata, material machines bereft of reason. New materialists challenge such views, spotlighting material agencies and human animals' non-exceptional position in a cosmos of material encounters. I investigate not matter generally but specific styles of being, manifest in bacterial, fungal, and vegetal lifeways. As the humanities are moving away from traditional frameworks of individualism, essentiality, and bounded selfhood, it might seem silly to focus on highly situated beings. However, planetary wellbeing begins when individual beings share unique talents, operating through difference and equity. To reiterate, distinction and entanglement are not mutually exclusive concepts but co-constitutive phenomena because beings only entangle with others when they contribute something new to an assemblage. I turn towards specificity whilst avoiding new materialist theory because I believe it has an in-

built proclivity to overlook living individuals which, though composed of matter, are ineluctable ‘matters of fact’: resolutely present and unique.

Furthermore, new materialist scholarship struggles to accommodate forms of knowledge beyond reasoning and scientific evidence. Wondering how to acquire plants’ permission before harvesting, Kimmerer argues that “I must use both sides of my brain to listen to the answer” (2013: 178). The left, excellent at analytical thinking, examines tangible signs able to illuminate a given population’s health, and subsequently whether such a population can sustain the giving act. At the same time, the “intuitive right hemisphere is reading something else, a sense of generosity, an open-handed radiance that says *take me*, or sometimes a tight-lipped recalcitrance that makes me put my trowel away.” (2013: 178; emphasis in original) These spiritual or non-rational communication modes are helpful when speaking with beings who express themselves in non-verbal, pre-linguistic registers. Pre-linguistic and biological (biosemiotic) modalities of expression are not rudimentary communication forms but universal methods of transmitting meaning we share with bacteria, fungi, plants, and all more-than-human creatures. We communicate with other human animals in pre-linguistic registers every day, speaking with bodily gestures or chemical excretions. Even as my case studies benefit from analyses of filmmakers’ methods and objectives, we can respect their sensorially elusive and challenging qualities as intentionally and/or unintentionally generated mysteries. Formal abrasions and signs evidence precise material encounters. They also invite us to speculatively explore other forms of consciousness. Enjoying these artefacts requires deploying our brains’ two sides in collaboration. Additionally, the new materialisms have been critiqued as appropriating Indigenous knowledge. Even though many new materialist insights (all life is agential, all life is interconnected) are core tenets of Indigenous kincentric and animistic worldviews, new

materialist thinkers rarely acknowledge their indebtedness to the originality and contemporary relevancy of Indigenous ways of knowing.

Lastly, I re-work existing ethnographical frameworks. Ethnobotany investigates recent and longstanding human animal-plant relationships. Artworks offer sources of ethnobotanical information, revealing how plants have been represented in anthropic systems of meaning. I advance different formulations, proposing two-way forms of communication. My case studies offer ethno-bacteriological, -botanical, and –mycological documents with a twist—in them, beings speak back. Plants’ perspectives might be cultivated through phytography, manifesting in alterations of analogue films’ chemical profile. In phytograms, we encounter human animals’ perspectives of plants and plants’ perspectives, anthropic and vegetal worldviews, coinciding in dynamic, collaboratively executed artefacts. Phytograms expose the possibility of living with plants in mutually enriching, multispecies contexts.

This observation inspires self-reflection on our operation and representation in vegetal systems of desire and meaning. How have plants sculpted our lives? Will plants rejoice in post-human futures? How might we satisfy plants’ needs, honouring our debts?

CHAPTERS

This thesis comprises seven chapters. Chapter 2 is my literature review, exploring: Indigenous knowledge; biosemiotics; and Germaine Dulac's (1882-1942) and Jean Epstein's (1897-1953) interrelated film theories. Epstein's concept of 'photogénie', in conjunction with Epstein's and Dulac's ideas concerning 'pure cinema', provide frameworks to explore living beings' cinematic qualities. Chapter 3 focuses on plants. I consider standard ways of imaging plants, map some alternatives, and introduce key ideas that run throughout the thesis: 'cinema's reracination'; 'cinema's becoming-plant'; 'plant-filming'; and 'filming like a plant'. Chapter 4 focuses on bacteria, analysing bacteriology's and cinema's entangled histories and futures. I develop the idea of 'cinema's reracination', advancing 'biofilms'. Technically, biofilms are matrixes microbes collectively produce when they choose to live together. I explore some recent artworks made by bacteria processing analogue film's gelatin-based emulsion as biofilms, stretching traditional beliefs about cinema as an exclusively anthropogenic phenomenon. Fungi hold my attention in chapter 5. I analyse some contemporary artefacts made with mushrooms' spores, proposing 'mycomedia' alongside the idea of 'weather as cinema', developing my argument concerning the expressive power of all life to produce cinematic art. In chapter 6, I turn to artists, scholars, and activists whose works went unreferenced in earlier chapters, paying particular attention to non-European and Indigenous artists. I pinpoint the key similarities shared by my case studies, refine my views on cinema, and address my own complicity in advancing Eurocentric biases. Chapter 7 introduces a 'non-violent cinema', mapping onwards inquiries. As I propose, a non-violent

cinema can only be an aspiration, never fully achieved. To navigate this inadequacy I conclude with cineremediation, a film practice developed through observing fungal lifeways, before investigating cinema as a machine divided at its inception.

This project introduces ways of thinking about and with cinema amidst planetary crisis, during a time when we, and cinema, might really disappear. I devise a terminological toolkit to study cinema in line with bacterial, fungal, and vegetal interventions. This vocabulary is incipient, there is work to be done, and I invite others to work with these terms and drive this—and their—projects forward.

§ 2

APPARATUS
LITERATURE
REVIEW

The need now is for a theory of different kinds of texts.

(Walter Benjamin 2002: 389)

ALTERNATIVE PEDAGOGIES

I begin with Indigenous epistemologies, acknowledging Indigenous knowledge's originality, plurality, and contemporary importance. Furthermore, Indigenous knowledge offers a framework to address more-than-human beings as instructors capable of modifying our destructive trajectory. My project begins from this fundamental observation. From Indigenous knowledge I shift to Jakob von Uexküll's 'Umwelt' theory, articulating living beings' lifeworlds' plurality and identifying how living beings articulate their subjectivity. I conclude with French filmmakers' Germaine Dulac's and Jean Epstein's approach to pure cinema and Epstein's concept of photogénie, exploring living beings' meaningful locutions as cinematic phenomena, and conversely, the cinema industry as a rudimentary, diminished form of a more fundamental mode of exhibition and expression.

Indigenous knowledge means Indigenous cultures' collective ecological knowledge. Though Indigenous knowledge systems are situated and specific, cultural similarities signal a shared canon, says Anishinabek scholar Robin Wall Kimmerer in her article '*Mishkos Kenomagwen: the Lessons of Grass*' (2018). Furthermore, writes Blackfoot scholar Leroy Little Bear, "Traditional knowledge is about the spirituality and livingness of the natural world and the role of humans in it" (2012: 521). However, speaking of Indigenous knowledge as 'traditional' does not confine it or its relevancy to the past. Mi'kmaq scholar Marie Battiste and James Youngblood Henderson, both claiming Chickasaw and Cheyenne ancestry, explain

how “what is traditional about traditional ecological knowledge is not its antiquity, but the way it is acquired and used. In other words, the social process of learning and sharing knowledge, which is unique to each Indigenous knowledge and heritage, lies at the heart of its traditionality.” (2000: 46) Furthermore, Indigenous knowledge regularly conveys deferential relationships to plants where plants play key roles in producing and disseminating knowledge pertinent to shared survival and flourishing. Many Indigenous cultures honour plants as relatives and teachers through sustainable regimes of environmental stewardship, learning how to steward environments by observing plants’ cyclical regimes of growing, withering, and decaying. In *‘Mishkos Kenomagwen’*, Kimmerer refers to this canon of knowledge as Traditional Ecological Knowledge, or TEK (2018: 35). Like Battiste and Henderson, Kimmerer proposes Indigenous knowledge’s heritage, as a living and lively canon of learning not only held in books or other devices but actively devised and shared by a lineage of knowledge holders dedicated to sustaining and disseminating such knowledge. TEK, Kimmerer continues, combines and relies on a complex relationship between action and philosophy, combining ways of thinking and being in the world to produce a blueprint for provisionally perpetual multispecies co-existence, as-of-yet unachieved in the West (2018: 35).

Indigenous Mongolian and Siberian animistic traditions contain similar but different views of more-than-human animals as not calorific storehouses but people enjoying “personalities, language, and even psychic abilities, just like humans” (Sarangerel 2000). Consequently, hunting is a regulated procedure comprising apology and restraint. When more-than-human animals are caught, Sarangerel explains, the hunters might lament their death by crying in order to appease the creature’s spirit. Furthermore, their bodies are shared equally amongst the community, maintaining balance between the human and more-than-human communities (Ibid.).

Tewa scholar Gregory Cajete quotes Robert Yazzie, Chief Justice of the Navajo Nation, who similarly explains that Navajo philosophy mixes action and thinking to produce a thoughtful guidebook for action rooted in care: “it is the lived practices of cultural forms that embody the Navajo understanding of their connectivity to the worlds of spirits of nature, humans, animals, plants, minerals, and other natural phenomena.” (2000; Yazzie qtd. in Cajete 64) Regarding TEK, care is frequently regarded in not only empathy or imagination, but spiritual and material connections. ““For me as a Navajo,” Yazzie continues, ““these other aspects are my relations. I have a duty toward them as they have a duty as a relative toward me”” (Ibid.) “Native science”, Cajete, now speaking himself, continues, “stems from a deeply held philosophy of proper relationships with the natural world that is transferred through direct experience with a landscape, and through social and ceremonial situations that help members of a tribe learn the key relationships through participation” (67).

Origin stories provide portals into this multifaceted canon of practices and knowledges. Kimmerer’s *Braiding Sweetgrass* begins with the Anishinabek creation story, when a hole opened between the earth and the Skyworld above. From it, Kimmerer explains, Skywoman fell “like a maple seed, pirouetting on an autumn breeze” (2013: 3) towards dark water below. Many eyes watched her fall, illuminated in the light beam. A skein of geese flew to catch her, ferrying Skywoman in a wash of “goose music” (Ibid.). The geese had never seen something like Skywoman before, yet flew to her assistance immediately. Now, there was no land. The geese knew they could not carry Skywoman forever. They called a council to decide how to proceed. Around them gathered many creatures. Turtle offered Skywoman a shell. Everyone realised Skywoman needed land to live and the intrepid divers recalled tales of mud beneath the water. A plan was quickly concocted.

The mighty diver Loon went first but surfaced with no mud. Kimmerer continues by telling us how Otter, Beaver, and Sturgeon offered their help but the journey was too taxing

(4). Skywoman perched on Turtle's back, marvelling at their generosity. Finally, only Muskrat was left. Though far stronger divers had failed, Muskrat bravely ventured into the water. Muskrat was gone for a long time and the creatures grew concerned for their courageous relative. Bubbles fizzed to the surface, followed by Muskrat's limp body, whose tiny paw was yet clasped tight around some mud. "Here, put it on my back and I will hold it", Turtle said. Skywoman obliged, spreading Muskrat's mud across Turtle's great, sturdy shell. Inspired by her new companion's gifts, Skywoman sang and danced in thanksgiving. From the mud on Turtle's back, a verdant earth spread out in all directions, inspired into creation by Skywoman's gratitude. Yet concerning this phenomenal moment's occurrence, we must not credit Skywoman only, Kimmerer says, for it stems "from the alchemy of all the animals' gifts coupled with her deep gratitude. Together they formed what we know today as Turtle Island, our home" (4). A good guest, Skywoman brought her own gifts. Before she fell, Skywoman tore from the Tree of Life many plants' fruits and seeds, spreading these over Turtle's shell. The earth transformed from brown to green, fed by sunlight from Skyworld, as flowers, grasses, trees, and medicines sprang up. Kimmerer tells us that since the creatures could now enjoy an abundance of comestibles, many elected to live with Skywoman on Turtle Island (5).

Kimmerer notes how different and similar this story is to a Christian one. Two fallen women, one moved to dance the earth into a garden of vegetal and creaturely abundance by her new companions' kindness, another banished from a garden, instructed to subjugate the earth. "Same species, same earth, different stories. [...] One woman is our ancestral gardener, a cocreator of the green world that would be the home of her descendants. The other was an exile, just passing through an alien world on a rough road to a real home in heaven" (7).

Consider this biblical passage in full, when the first two human animals receive their original instructions.

God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth. And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat (Gen. 28-29).

Plant life, existing only as resource, fuels animal satisfaction—and satiation. In an Anishinabek view, more-than-human animals and plants are people living lives comparable to, yet distinct from, ours. The Skywoman story communicates personhood’s democratic application besides the possibility of multispecies communication, which requires sensitively attuning ourselves to others’ pre-linguistic and biological (biosemiotic) vocabularies, and taking others’ means of communicating seriously. This is no less systematic, not least because plants’ growth is systematic, incorporating repetition with minor variation, and plants can communicate with us by how they choose to grow. Alternatively, we may utilise media amenable to both parties’ methods of communication, activating multispecies knowledge transmission.

In Rarámuri belief, life is related through shared materialities and histories. Rarámuri scholar Enrique Salmón says that Rarámuri cosmologies are “kincentric” (2020: 21), not anthropocentric. Anishinabek cosmologies are also kincentric, under Salmón’s definition. Approaching others through kinship and deference precipitates practical outcomes. Kimmerer, in *‘Mishkos Kenomagwen’*, contends that “Native environmental philosophy acknowledges that our human lives are utterly dependent on the lives of other beings and thus

our first responsibility is for gratitude.” (2018: 31) For Kimmerer, the Skywoman origin story communicates how the world is a gift reliant on multispecies collaboration. For this reason, many Indigenous communicates, such as the Anishinabek, have been characterised as ‘cultures of gratitude’. Gratitude can occur spiritually or emotionally, but it can also produce practical results capable of human and more-than-human survival. How? Thanksgiving and gratitude can precipitate self-restraint, which helps to secure abundance. Tellingly, Indigenous storytelling is rich with warnings concerning the failure of gratitude. As Kimmerer explains, “Gratitude is most powerful as a response to the earth because it provides an opening to reciprocity, to the act of giving back” (2018: 31). Alongside reciprocity, gratitude is another element of cineremediation. Cineremediation means adapting practice to show gratitude for other beings’ gifts, even modifying methods so that acts of taking can be partially, maybe even predominantly, beneficial from the giver’s perspective. I want to explore how we can give back in thanks through cinema.

In the Rarámuri creation story matter and *iwígara*, the breath of life, met, and the Creator, Onorúame, was conceived. Onorúame made the earth, populating it with more-than-human animals and plants. Many plants first lived as humans before assuming vegetal forms. Onorúame then created human animals, who, as Salmón explains, fell “from the sky like raindrops” (2012: 15). However, they neglected their responsibilities to their kin. Onorúame purged the land with a flood, sparing only two children. After three days, Onorúame appeared with corn seeds, instructing them to plant the seeds after the waters’ recession. We grew from these corn stalks. For the Rarámuri, Salmón tells us that human animals are “the children of corn” (Ibid.). “In a worldview based on *iwígara*,” Salmón continues, “humans are no more important to the natural world than any other form of life.” (2020: 2) Rarámuri belief is based on kinship, and shared spiritual and material relations. To be related to all other life forms, and to share materialities and breath with such beings, precipitates care and responsibility, as

well as the capability to honour forms of life otherwise considered lowly, or inconsequential. “In short,” Salmón summarises, “I see myself as one of many stewards of the land and natural world. I share breath with it, so I endeavor to minister to it with appropriate ritual, thought, and ceremony” (Ibid.). In a Rarámuri worldview, plants were here before us. Human animals’ collective gestation was stewarded by plants, who provided us with the alimentary means of survival and taught us how to live. These teachings and gifts still flow from plants to us. How can we acknowledge and respond to them, in daily life and also cinema?

Non-verbal, plants teach by being. In many cases, Indigenous knowledge is passed on, as mentioned by Negam, Battiste and Henderson, and Cajete, through lived experience and learning by doing. Such learning scenarios are no less rigorous than western approaches, both grounded in taxing periods of lifelong study. However, Indigenous approaches emphasise the importance of empirical observation, active participation, and mutually beneficial sharing acts. Through this framework, we no longer need to learn ‘about’ plants from anthropogenic sources, but can approach plants as teachers directly, truly learning in the field. As Kimmerer asks, if you were tongue-tied and yet desperate to speak, would you not act it? Lost for words, would you not turn to gesture, as a universal modality of non-species specific speech? Before long you might become so adept at bodily communication that just to look at you move would reveal an entire story or worldview. And this is the reality of plants (2013: 129). Plants teach reciprocity and restraint, about using only what is at hand, never taking too much, and always giving back more than we take. “Not only are the plants acknowledged as persons,” Kimmerer continues in *‘Mishkos Kenomagwen’*, but they are also recognized as our oldest teachers.” (2018: 28) Plants not only precede human animals’ existence. Many plants express modalities of consumption leaving little to no negative impression on the world, showcasing paradoxical capabilities to rejuvenate by eating, turning light into food before freely sharing it to no being in particular. “No wonder they are revered as teachers by we

humans who are just learning how to live on the earth”, says Kimmerer (Ibid.). In fact, humans, who lack the generous gifts of plants and animals, are often referred to in Indigenous cultures as ‘the younger brothers of creation’ (Ibid.). However, as mentioned in chapter 1, plants learned how to conduct photosynthesis from bacteria. Moreover, fungi, in partnerships with algae, produced the environmental conditions amenable to creaturely and vegetal life, as I will discuss in chapter 5. Consequently, I approach bacteria, fungi, and plants as distinct but related teachers with valuable lessons to contribute. They taught and yet teach each other. Now it is time for us and cinema to learn from them. Not only their individual lifeways but their entangled ways of learning from each other (through endosymbiosis, for example) provide key teachings. These varied instructions are ubiquitously applicable to cinema production.

In the Judeo-Christian origin story, God’s original instructions pertain to human animals’ exceptionality. By contrast, in another Anishinabek story, the Creator, Gitchie Manito, took the earth’s four sacred elements, blowing into them with a sacred shell. Nanabozho, Original Man, was created. Relative to all Creation, Nanabozho was made of similar materials, sharing mutual origins. Nanabozho enters a world underway, bursting with intelligence. Dissimilar to Christian logics, Nanabozho’s late arrival does not guarantee supremacy but articulates relative naivety, manifest in human animals’ complete reliance on others to survive. Kimmerer explains how “The Creator gave Nanabozho some tasks in his role as Original Man, his Original Instructions [...]: to walk through the world that Skywoman had danced into life.” (2013: 206) The objective was to walk in a way that, as Edward Benton-Banai explains, “each step [became] a greeting to Mother Earth” (2010: 52). Yet Original Man did not yet know what that entailed or meant. Luckily, he was surrounded by beings who were not only enjoying established lives on Earth, but possessed the capacity and willingness to share their knowledge. Furthermore, Kimmerer suggests that such

instructions were not obligatory rules, but part of a guidebook or framework providing not a concrete trajectory, but an orientation or sensibility (7). How might filmmakers adapt their methods in response to others' guidance, creating new, mutually beneficial maps for making? What would it mean to warp practice until every processual step became a greeting to a just good enough Mother Earth, acts of reciprocity offered to those lives conceptually and materially involved in, even consumed by, filmmaking processes?

“Original Man traveled everywhere”, Ojibway scholar Benton-Banai (1931-2020) says in *The Mishomis Book* (1988), “There was not one plant, animal, or place that was not touched by him” (7). Each plant Nanabozho met taught him about their varied gifts. “As he walked,” Benton-Banai continues, “Original Man talked with the animals [...] nam[ing] them as he went. He noted that some animals were good for we-sin’-ni-win’ (food) and medicine. He noticed that each type of animal had its own individual kind of wisdom” (Ibid.). Nanabozho noticed how more-than-human animals and plants regularly flourished with local companions, realising his loneliness. ““Why am I alone?”” Nanabozho asked Gitchie Manito, as we learn in *The Mishomis Book*. ““Why are there no other ones like me?”” ““I will send someone to walk, talk and play with you”” Gitchie Manito answered (7). The Creator sent Wolf. Nanabozho again contacted Gitchie Manito, explaining how he had visited everyone. Gitchie Manito instructed Nanabozho to repeat the same journey with Wolf, to see if their relationship revealed new discoveries. Benton-Banai tells us that “Original Man and Ma-en’-gun [Wolf] walked the Earth and came to know all of her. In this journey they became very close to each other. They became like brothers. In their closeness they realized that they were brothers to all of the Creation” (8). The multispecies relationship of Nanabozho and Wolf illustrates human animals’ constituent dependency on others’ gifts, manifest in the consumption of more-than-human animal (which, in the west, many of us do not need to eat) or vegetal flesh (which all humans must eat). Furthermore, it metaphorically communicates

how sensitivity to others' viewpoints reveals new perspectives, how companionship can be personally and mutually enriching. The films on which my case studies focus often take the form of multispecies co-productions reminiscent of Nanabozho's journeys with Wolf. For example, Jennifer Reeves's *Landfill 16* (2011) comprises bacteria and fungi digesting the gelatin-based emulsion of analogue film recycled from a previous work, *When it Was Blue* (2008). This is a circular journey comprising (at least) two iterations. First, Reeves's adventure, manifesting in *When it Was Blue*. Next, Reeves's re-engaging that artwork by welcoming others' inputs, who reveal fresh perspectives by interacting with film emulsion, co-producing *Landfill 16*. Although *Landfill 16* also explores debates related to process cinema and new materialism, Reeves invokes Nanabozho's adventures from the beginning of the earth, where he engaged with more-than-human beings as teachers, and companions. "From the very beginning of the world", says Kimmerer, "the other species were a lifeboat for the people. Now, we must be theirs" (2013: 8). This is not a commentary on human animals' exceptionality, rather our collective responsibility to care for those who have always cared for us. As Kimmerer explains in *Braiding Sweetgrass*, "If we are fully awake, a moral question arises as we extinguish the other lives around us on behalf of our own. Whether we are digging wild leeks or going to the mall, how do we consume in a way that does justice to the lives that we take?" (176-177).

As one answer Kimmerer introduces the 'Honorable Harvest' (180), a system of protocols aimed at ameliorating plants' extraction, itself learned from plants. Like Nanabozho's Original Instructions the Honorable Harvest is not an exhaustive set of prescriptions. Kimmerer proposes it as a framework "that govern[s] our taking, shape[s] our relationships with the natural world, and rein[s] in our tendency to consume—that the world might be as rich for the seventh generation as it is for our own" (Ibid.). Kimmerer explains that

The guidelines for the Honorable Harvest are not written down, or even consistently spoken of as a whole—they are reinforced in small acts of daily life. But if you were to list them, they might look something like this:

Know the ways of the ones who take care of you, so that you may take care of them.

Introduce yourself. Be accountable as the one who comes asking for life.

Ask permission before taking. Abide by the answer.

Never take the first. Never take the last.

Take only what you need.

Take only that which is given.

Never take more than half. Leave some for others.

Harvest in a way that minimizes harm.

Use it respectfully. Never waste what you have taken.

Share.

Give thanks for what you have been given.

Give a gift, in reciprocity for what you have taken.

Sustain the ones who sustain you and the earth will last forever (183).

The Honorable Harvest does not instruct us on what not to take. Conversely, it proposes a model regarding what we should take, and how we should do so (186). Unlike plants, we are heterotrophs, meaning we cannot live without taking. “In order to live”, says Kimmerer, “I

must consume. That's the way the world works, the exchange of a life for a life, the endless cycling between my body and the body of the world" (177). That said, we can make choices about such gastronomic exchanges, and not all exchanges are the same, as expressed by veganism, or the variety of other dietary persuasions. Yet regardless of how we elect to eat, plants enjoy nutritional perfections beyond our grasp. At some point, plants' expansive lessons strike our biology's inflexible limits, illuminating our inability to fully implement plants' teachings. Fortunately, taking is not automatically destructive, and we are not alone in the biological necessity to take. We share this shortcoming with necrogenic fungi, who require dead matter to live. However, this form of fungal taking is slightly different, as the taken is already dead. Technically, necrogenic fungi do not need to kill, they simply need organic material. But is this not how most of us enjoy our food, whether composed of animal or vegetal matter? Already dead, vacuum-packed in plastic? Nevertheless, we achieve synchronicity with fungal lifeways given mutual reliances on the necessity of death and killing, whether directly or indirectly. Furthermore, plants' regenerative excellency helps us comprehend taking's non-destructive dimensions. By taking only plant sections instead of uprooting entire plants, plants' flourishing can be enhanced, not curtailed. Additionally, as I analyse in chapter 5, certain fungi and plants require human animals' interventions to flourish. Collectively, bacteria, fungi, and plants show us how to take in ways that sustain even as they destroy.

Furthermore, traditional environmentalist perspectives of ecosystems as self-regulating phenomena tending towards harmony in human animals' absence do not produce viable solutions to current ecological crises because we cannot, at present, decouple from the earth. As summarised by William Cronon in 'The Trouble with Wilderness' (1996), such perspectives arguably derive, at least in the United States, from a cultural movement including participants like Henry David Thoreau (1817-1862) and John Muir (1838-1914),

following which various ‘national parks’ emerged in the mid- to late-nineteenth century, like Yosemite and Yellowstone. To preserve such environments’ rugged quality, human animals were barred entry except as visitors, since we are not part of such landscapes but rather a detrimental, oppositional force. Nor should we want to decouple from the earth. This exquisite, good enough planet is our shared home. Materially and metaphorically, we are made of, and by, the earth. Its climate sculpted our evolution. Our earthly constitution and evolutionary histories on earth literally and spiritually bind us to all living beings, who have been our companions since the beginning of planetary time. What else could we want, beyond this incomprehensibly complex and horrifically scarred earth? Environmentalist perspectives promoting nature’s supremacy over human animals or, conversely, looking towards a techno-utopian future beyond planet earth entrench the nature/culture binary, construing human animals as a ‘non-natural’ stain.

Conversely, the Honorable Harvest helps face planetary annihilation head on. It is especially helpful because it is not prohibitive, but affirmative. It does not tell us what not to do. Quite the opposite, it encourages to do certain things, and to do them in celebration and gratitude. Like eating food that has been harvested sustainably and Honorably, or using technologies in order to reduce harm, or accepting what has been given in thanks (Kimmerer 2013: 187). Reciprocity is critical. Why? Because reciprocity calls us to give back for that which has been given. As Kimmerer explains, reciprocity is key to resolving the challenges of taking gifts—or whole lives—by returning valuable gifts to those who sustain us. We must begin exploring the possibility of entering into reciprocity with more-than-human lives. In this thesis, I am electing to explore the possibility of doing so through cinema. How can cinema implement such protocols? Filmmakers might modify audiovisual capture and material extraction so that the giver is not exhausted, maybe even strengthened, in the taking. An ‘Honourable Cinema’ is an art of reverence targeted at the abundance of earthbound

consciousness and human animals' deferential relationship to it. I investigate this phenomenon in chapter 7.

How else might we approach the earth and the beings we share it with as equal and distinct subjects, honourable companions, and insightful teachers? Estonian biologist Jakob von Uexküll (1864-1944) offers an answer. Like Kimmerer, Uexküll exalts the affluence of living beings' lifeworlds, each operating in relative privacy. Where Indigenous knowledge helps address living beings as instructive teachers, Uexküll, through Umwelt theory, offers a framework through to explore how beings express their subjectivity and teachings.

UMWELT

Jakob von Uexküll, born the son of a baron in 1864 in Estonia, was economically ruined by the First World War. Uexküll consequently began work at the University of Hamburg, founding the ‘Institut für Umweltforschung’, the Institute for Environmental Research. Uexküll was fascinated by how living beings engage with their environment. Pioneered by Uexküll, biosemiotics investigates how living beings make meaningful signs and interpret significant cues through biological and pre-linguistic registers. Pick, in ‘Animal Life in the Cinematic Umwelt’, contends that Uexküll was disturbed by Charles Darwin’s (1809-1882) mechanistic reduction of life to genetic mutation and the violent satisfaction of biological needs (2015). Brett Buchanan, in *Onto-Ethologies* (2008), explains how Uexküll saw Darwin’s theory of evolution as a “‘vertical’ model of descent, and one that emphasizes far too much a chaotic view of nature’s formations” (8). However, Buchanan continues, “Uexküll was not necessarily anti-evolutionary, but his focus was certainly directed elsewhere, specifically toward a more ‘horizontal’ model that looks at how organisms behave and relate to things across their respective environments.” (Ibid.) Uexküll was not concerned with exploring living beings’ behaviours, evolution, or lifestyle through recourse to natural selection, as proposed by Darwin. By contrast, Uexküll was interested in exploring their objectives as represented by their reaction to, and projection of, meaningful signs.

Uexküll moved from, as Pick says, “what he saw as the implicit nihilism of Darwinism” (2015: 224) to autonomous beings’ unique relationships to private, meaningful

worlds. In *A Foray into the Worlds of Animals and Humans* (1934/2010 [*Foray*]) Uexküll argues that “Every living thing is a subject that lives in its own world, of which it is the center” (45) “This little monograph does not claim to point the way to a new science”, Uexküll humbly explains in an earlier translation titled *A Stroll Through the Worlds of Animals and Men*, proposing that “Perhaps it should be called a stroll into unfamiliar worlds; worlds strange to us but known to other creatures, manifold and varied as the animals themselves” (1934/1957 [*Stroll*], 5). Uexküll continues, arguing that each world (‘Umwelt’) is actively modified by their owners’ relationships to specific ‘carriers of meaning’ (140). These carriers’ appearance and availability determine worlds’ horizons, which are constantly in flux. Carriers of meaning can be larger phenomena, like a mighty oak tree, or mere portions of beings’ bodies, like an acorn. For example, from a bee’s perspective what scans as meaningful are most likely not whole plants, rather aspects of plants synchronised with bees’ desires, like specific flowering sections. Consequently, we might say that plants call to bees via phytosemiosis. Plants’ voluptuous bodies and alluring scents signal culinary delight or sexual excitement; the emittance of electric fields signifies nutritional non-abundance; plants’ receptivity to vibrations made by bees’ wings precipitates the intensification of pollen sugar density. In such scenarios, plants’ roots have not registered in the bee’s world. Yet petals and electro-chemical excretions ring like a bell. By charting such engagements we may verify others’ worlds’ parameters, glimpsing their intricacies. Uexküll explains that “The first task is to identify each animal’s perceptual cues among all the stimuli in its environment and to build up the animal’s specific world with them” (*Stroll* 13). We can never access others’ worlds, only map their contours, speculating on their internal constitution. Biosemiotics enunciates reason’s limitations and life’s innate recalcitrance.

How do beings modify their worlds? Uexküll explains that “Figuratively speaking, every animal grasps its object with two arms or a forceps, receptor, and effector. With the one

it invests the object with a receptor cue or perceptual meaning, with the other, an effector cue or operational meaning” (*Stroll* 10). A bee might perceive a flower with a ‘receptor’ organ (e.g. an eye), investing it with perceptual meaning. Then, they might physically manipulate it with an ‘effector’ organ (e.g. their mandibles or proboscis), investing it with an operational meaning. The receptor cue is constitutively modified by intervention, altered on entry into bees’ worlds. The desirable object will be (part of) another being, which “participates in the action only to the extent that it [...] possess[es] certain qualities that can serve as perceptual cue-bearers on the one hand and as functional cue-bearers on the other” (*Ibid.*). Movements from perceptual to operational meaning constitute the ‘functional cycles’ through which beings mould their worlds.

Consider the *Ophrys apifera* (bee orchid), an herbaceous plant whose labellum recalls a female bee. Evidencing floral morphological and chemo-sensory mimicry, the orchid emits allomones (a ‘semiochemical’ released by a member of one species that impacts another member of another species, exclusively benefitting the originator not the receiver) echoing female bees’ scents. Excited males pounce onto the orchid’s bee-like labellum, enacting pseudo-copulation. Despite such proximity, Uexküll argues that Umwelten (plural of Umwelt) are closed off from each other. How can this be right? In *The Open* (2004), Giorgio Agamben engages with Uexküll’s work at length. Agamben considers spider-fly affiliations, evocatively explaining how

The spider knows nothing about the fly, nor can it measure its client as a tailor does before sewing his suit. And yet it determines the length of the stitches in its web according to the dimensions of the fly’s body, and it adjusts the resistance of the threads in exact proportion to the force of impact of the fly’s body in flight. Further,

the radial threads are more solid than the circular ones, because the circular threads—which, unlike the radial threads, are coated in a viscous liquid—must be elastic enough to imprison the fly and keep it from flying away. [...] Indeed, the most surprising fact is that the threads of the web are exactly proportioned to the visual capacity of the eye of the fly, who cannot see them and therefore flies toward death unawares (41-42).

Though more or less complex, *Umwelten* are equally meaningful. This is the critical aspect of Umwelt theory. That every being exists within its world with absolute and equal completeness (*Stroll* 11). No experience is innately better, regardless of carriers' variety. Agamben, analysing Uexküll's example of the tick, helps us understand how ticks seemingly enjoy only three carriers of meaning. First, there is the smell of the butyric acid flowing within mammals' sweat. Next, the specific temperature of thirty-seven degrees, which is the temperature of mammals' blood. Third, the key typological features of mammalian skin, namely the presence of hair and blood vessels. Though enjoying a perspective restricted to a mere three criteria, the tick enjoys a relationship to such carriers of meaning whose intensity is likely beyond anything human animals' will experience throughout their purportedly richer lives (2004: 46-47). Importantly, *Umwelten* are never prisons, bleak and grey. Even in apparent poverty they exude high abundancies. The tick, deaf and blind, seemingly notices only blood's temperature, neither taste nor texture. After the tick eats, it falls to the ground, lays its eggs, and dies. Buchanan explains how the tick's world is coiled around such phenomena to such an extent that all other carriers of meaning present in the external world surrounding the tick bare no significance. Moon, clouds, and sun leave no impression, even as they fundamentally capture other organisms thriving in the tick's midst (Buchanan 24).

Yet these statements should be qualified with ‘seemingly’, as we can never know anything with certainty concerning other beings’ internal worlds, beyond the simple fact that, from such beings’ perspectives, they are complete, even if they seem impoverished to us. The tick’s world might abound with sensorial beauty. The vampiric drive for blood might override such pleasures, not render them imperceptible. Who can say if the tick, pausing on the grass, does not somehow drink in the meadow’s beauty, before drinking our blood? These questions are, if not meaningless, ancillary to the tick’s reality which is lived uniquely and to its maximum, an adventure of risk and reward.

Umwelten are not species specific. A cow might turn to grass in hunger. Another might overlook that grass completely. In this latter scenario, the grass has borne no significance for the cow, who might prefer to bask in the sun. Through sovereign capriciousness and subjective diversity, various Umwelten emerge. Furthermore, for Uexküll, there is no meadow as such. There is a meadow for the fly, evading the cow’s tail; the hungry cow, munching on the grass; the grass, proliferating rhizomatically underground; the fungus, ex- and internally navigating plants’ roots; the bacterium, surfing fungal highways; and the spider, stringing a web to the fly’s sorrow. Neither does the ‘world’, an objective space and time in which these beings simultaneously move, exist. Uexküll calls this the *Umgebung*, which he calls human animals’ Umwelt. As Uexküll explains, “The animal’s environment is only a piece cut out of its surroundings, which we see stretching out on all sides around the animal—and these surroundings are nothing else but our own, human environment” (*Foray* 53). Buchanan argues that the reality we experience is simply what we subjectively perceive, which is for us as it is for ticks the finest slither of the world. In this sense, an objective reality does not exist, for beyond the subjective experiences that render meaningful worlds that is nothing. Key to Uexküll’s theory is that reality is at once singular and plural, and human and more-than-human animals equally enjoy subjective realities; or, subjectivity

(Buchanan 13). “There is no space independent of subjects”, continues Uexküll, “If we still want to cling to the fiction of an all-encompassing world-space, that is only because we can get along with each other more easily with the help of this conventional fable” (*Foray* 70).

If there is nothing beyond subjective experience, how do Umwelten interpenetrate? A tick may leap from a plant onto a dog, burrowing into her skin. This dog may have noticed neither tick nor grass. However, she may have noticed a faraway bark. I might hear that bark, too. I might also notice a squirrel dash across the path, pursued by the dog. The squirrel has simultaneously appeared in our Umwelten, bearing different meanings. Snack, for the dog. For me, an acrobatic adventurer. Mutually closed off, Umwelten combine via elements bearing polyvalent meanings, forming a larger relational structure. “The relations between things expand and mesh with one another in the intricate web of life”, says Buchanan (25). Through streamlined or contrapuntal connections, Umwelten intertwine like notes in a musical score, which Uexküll calls ‘nature’. Buchanan explains how Umwelt theory proposes an earth in which organisms are necessary to understanding their relations. Umwelten are therefore, as mentioned earlier, not prisons. By contrast, they are interpenetrating and overlapping spheres, whilst each being can be conceived as a melody whose music necessarily goes in search of a partner’s emittance for accompaniment (28). Maintaining lifeworlds’ integrity as they entangle to form a cohesive whole, Uexküll balances specificity and equality. Uexküll likened Umwelten to ‘soap bubbles’, their boundaries in endless flux and capable modification by others (*Foray* 69). Uexküll invites us to navigate our Umwelten in perspectival wonder, measuring our actions against what we perceive: a superabundance of beings satisfying their desires in relative privacy. Uexküll’s theory precipitates philosophies of ecological restraint, grounded in collective recalcitrance. We may observe, never entirely know, others’ lifeworlds. Uexküll’s theory is profoundly humbling. My reality presents only one way of experiencing a world. This is neither less nor more valid than a tick’s experience.

To expand concepts of reality as plural we might invite others to co-produce cinematic art with us. As I will explain below and in the following section, other scholars have explored Uexküll's relationship to cinema. Popular storytelling modes and forms are generally human-centered, construing reality as coterminous with certain human animals' perception. However, analogue film is amenable to others' styles of address. As mentioned in chapter 1, plants can modify photochemical film through 'phytography', a technique of making films with plants' bodies and chemistry pioneered by Karel Doing. In phytography, phytochemistry (plants' chemicals) and cine-chemistry (the chemicals on photochemical film) entangle, producing novel imagery (phytograms). "As such," says Doing, "we might say that the phytogram translates a plant's experience of the world into an image that is legible for humans: plant sensation captured on film" (2020: 31-32). Phytograms are phenomena and media of diffraction, letting us investigate the filiations shared between anthropic, cinematic, and vegetal being. Describing phytography in Uexküllian terms, we might say that the cine-chemicals are carriers of meaning to plants, who modify their chemical composition. The phytochemicals are carriers of meaning for the film's organic and chemical components, responding to plants' transformative touch. Imagery scans as meaningful to anthropic viewers, indicating plants' subjectivity. We can approach phytograms as polyvalent carriers of meaning abundant in cine-ethnobotanical information, showcasing alternate ways of engaging with plants alongside plants' viewpoints. Human animals' experiential horizons can be expanded to include other forms of consciousness by strategically employing polyvalent carriers of meaning, like photochemical film. Consequently, cinema emerges as a diffractive medium of multispecies collision. Phytograms provide windows onto plants' realities, typifying cinema's capacity to ameliorate the material and conceptual inadequacies of anthropic perception.

Cinema offers tools for biosemiotic fieldwork. In this sense, Uexküll leads us away from ideas of cinema as (predominantly) art, initiating exploration into cinema as, conversely, a diffractive medium of biosemiotic (scientific) study, which is not to say that cinema has not been deployed in scientific contexts since its inception. However, from another perspective, Uexküll helps us explore living beings' bodies, even elemental phenomena, as works of cinematic art; or, cinematic phenomena producing meaningful signs by moving in time. Uexküll pulls us into deeper, more immediate engagements with living beings as works of art, expanding understandings of art beyond traditional limits. Biosemiotics provides frameworks to expand dominant understandings of cinema's value and identity. Uexküll sought to peer *into* others' Umwelten, from our point of view. I am interested in deploying cinema to help others signal to us from *beyond* our Umwelten, on their own terms. I am not interested in cinema's ability to expand our perspective through advancements in digital technology capable of speculatively rendering plants' views, producing feedback loops. Fortunately, although every living being is never fully decipherable, always reserving something, we are not entirely confined to our own viewpoint, nor are we exceptional in our ability to communicate. Cinema offers a medium of diffraction through which others can exhibit their consciousness, inviting our participation in, and speculation on, alternative regimes of experience that we can somewhat, if never entirely, explore and comprehend. I want to re-invigorate cinema's designation as a medium by approaching cinema as a diffractive interlocutor partially bridging the gaps between Umwelten.

Work has been done on Uexküll and cinema by Graiwoot Chulphongsathorn, Pick, and Inga Pollmann, whose work I will explore in the next subsection. Pick explores "cinema's aptitude for showing the creaturely universes, or 'life-worlds' of human and nonhuman beings" (2015: 221), introducing the expression "zoomorphic realism" (Ibid.).

Zoomorphic realism speaks to media in which a more-than-human animals' experience is rendered from the perspective of the creature itself (222). To achieve this phenomenon, a filmmaker might deploy a variety of strategies to approximate and invite exploration of a more-than-human being's lifeworld, which would open before us in its situatedness. In her article, Pick interprets formal techniques capable of faithfully representing animals' internal worlds. Conversely, I move towards other beings' ability to "communicat[e] their communicability", as Agamben might say (1996: 58), by working directly on analogue media, showcasing their possession of private worlds remaining closed off even in their revelation. For through such procedures *Umwelten* are not exposed, turned inside out, for we encounter only the mechanisms of production. Additionally, what of bacterio-, fungo-, and phyto-morphic realisms? Bacteriosemissis is largely a question of processing nearby materials whose properties bacteria modify to suit their own or others' needs, co-building specific *Umwelten*. When bacteria process cinematic substances (e.g. gelatin) they can creatively alter films' material structure and chemical profile. In chapter 4, I analyse films made by bacteria processing analogue film's gelatin-based emulsion, approaching them as 'biofilms'. Biofilms invoke a bacteriomorphic realism, embodied documentaries of bacterial being. Signalling the affluent situatedness of bacterial worlds, biofilms preserve bacterial privacy, revealing their makers' characteristics alongside the methodologies of their creation, yet not their content. My case studies keep us at arm's length even whilst inviting speculation on others' subjectivity. This is a critical distinction, coinciding with Uexküll's perspective. Refusing to reveal and overlook others' lifeworlds, key filmmakers explore biodiversity whilst illuminating reason's limitations.

However, for Uexküll, plants lack organs analogous to animals' effector or perceptual organs. Plants are also sessile, mobile-in-place. Moreover, Uexküll believes that plants lack nervous (or analogous) systems capable of facilitating communication between perceptual

and effector organs. Consequently, Uexküll suggests that plants cannot manipulate their worlds nor can carriers of meaning appear to them. However, as Martin Krampen (1928-2015) argues, plants' styles of perception are not non-existent, yet different and also similar. Building on Uexküll's work, Krampen explains how vegetal "semiosis is different from that of human and animal subjects in such a way that it merits its own semiotic analysis" (2010: 266). Phytosemiosis synthesises at least two registers. The macro-scalar movements of plants' bodies and micro-scalar phytochemical transactions. Despite plants' semiotic specificity, anthropo-, zoo-, phyto-, and cine-morphic processes align, sharing common principles. Noting fundamental similarities does not devalue beings' unicity. Conversely, it is through resonances that shared communication begins. Cinema, animals, and plants require light. Bacteria and fungi indirectly need light, living with, and feeding on, plants and human and more-than-human animals. Bacteria, cinema, fungi, animals, and plants also unanimously require water and other minerals. Animal and vegetal lifeways further entangle through shared, reciprocating reliances on oxygen and carbon dioxide. Additionally, contrary to Uexküll's belief, plants' sessility is not total. Doing argues that "Plants are neither static nor mobile" (2020: 32). How? Belowground, plants' roots are adventurous, and flowering plants move by proxy, soliciting meteorological and mammalian motion to disperse their seeds on the wind or mammalian fur, collaboratively ameliorating locomotive inadequacies. Plants navigate their environments by co-opting or replicating meteorological and mammalian regimes of motion and semiosis. They do this by enticing mammals or growing in ways that complement, channel, or otherwise harness mammalian or meteorological rhythms. In chapter 3 I explore how plants sculpt their *Umwelten*, drawing on Krampen's and Eduardo Kohn's biosemiotic theories, whilst investigating cinema as a privileged medium of plant-human animal communication.

Chulphongsathorn considers how filmmakers can acknowledge vegetal *Umwelten*, describing how artists might synchronise cinema and “plant time” (2017: 84). Instead of ignoring plants’ temporal specificity by utilising time-lapse cinematography to make plants’ movements satisfy anthropic schedules, filmmakers may “*join the plant*” (Ibid.; emphasis in original). This can be achieved by randomly filming human animals and plants across different seasons, privileging neither. Alternatively, I propose thematically and materially attuning cinema with bacterial, fungal, and vegetal regimes of existence. That is, honouring and relaying such beings’ subjectivities and instructions audiovisually, at narrative levels through films’ content and form, and methodologically, by subordinating process to their schedules. Filmmakers might physically incorporate plants into filmmaking processes by hand-processing film with plants, entangling flora and film, whilst synchronising harvesting strategies and films’ gestation to plants’ organic processes. Adopting such processes, my case studies exist in multiple *Umwelten* simultaneously as carriers of polyvalent significance. For bacteria, sources of gelatin-based food. For plants, canvases upon which to chemically and gesturally inscribe. For mushrooms, places to sporify. For us, windows onto others’ semiosis.

PHOTOGÉNIE

Uexküll explores reality as startlingly plural and helps us consider other beings' methods of communication, and perhaps most importantly, how we can witness them in action.

Biosemiotic enunciations showcase how living beings express interpretive meanings garnered from a semiotically abundant environment, besides others' ownership of unique, impenetrable lifeworlds. Like cinema, these enunciations exist—are made and received—in the dimensions of movement and time. Consequently, might we approach them as inherently cinematic? More precisely, as indicating a form of pre-cinematic cinematic expression; or, a mode of cinematic expression before and beyond cinema's industrial, anthropogenic form? In conjunction with Germaine Dulac's ideas about 'pure cinema', Jean Epstein's concept of 'photogénie' allows us to respond affirmatively, tracing living beings' fundamental 'cinematic-ness'.

Inga Pollmann explains how Uexküll drew on chronophotography, which decomposes motion, revealing things too fast to see. Chronophotography requires photographing moving subjects at generally predetermined intervals, exposing gestural specificities. Pollmann writes that "Uexküll discovered in experiments with starfish that chronophotography could provide a kind of third eye [...] that corresponded neither to what the starfish itself saw nor to what humans, in the absence of the camera, could see." (2013: 780) In these scenarios, Uexküll encountered a mechanism capable of revealing other beings' individual *Umwelten*. Pollmann investigates cinema, as perceived by Uexküll, as an expanded third eye, and a meeting point or medium bridging multiple *Umwelten*. Likewise, Epstein proposes cinema's ownership of a

unique perspective or Umwelt, and even a capacity for thought. Cinema, for Epstein, is an alien, more-than-human power capable of inflecting previously unimaginable views with its own desires. Epstein's texts, Pollmann argues, speak to a "queered perception" which Uexküll's encounters with film similarly inspire, particularly through reference to the mechanical, inhuman perspectives cinema offers in conjunction with cinema's non-anthropocentric ability to place human animals on an earthbound continuum composing human and more-than-human life (782). Epstein proposes an 'Uexküllian' theory of cinema. Alternatively, Uexküll proposes an 'Epsteinian' account of biology. Furthermore, for Epstein, cinema is uniquely equipped to render more-than-human biosemiosis given how cinema similarly communicates and interprets meaning whilst operating in the worldly dimensions of movement and time. For both, cinema is a polyvalent carrier of meaning, synthesising diverse Umwelten. However, cinema, as perceived by Epstein, is a thoughtful subject, contributing special views.

Epstein is concerned with medium specificity, exploring cinema as a distinct art. From 1895 to 1906, films generally worked to shock and surprise. Narrative continuity and montage were largely superfluous to artists' objectives to "*show*" (Gunning 1990: 57; emphasis in original). Early films were pared back, operative via one or a handful of shots, roughly a minute long, duration usually determined by a roll of film. This is, in Tom Gunning's words, the "cinema of attractions" (Ibid.). Epstein began writing in the late-1910s, when cinema was still widely conceived, as Dudley Andrew writes, as a "vine around the great trunks of serious and popular culture" (1976: 11). Early critics like Riccioto Canudo (1877-1923) and Abel Gance (1889-1981) sought to establish cinema as an art, not a fairground attraction or type of filmed theatre. Early French critics and filmmakers Dulac and Epstein approach cinematic specificity through cinema's startling, non-anthropocentric power. This was grounded in photo- and cinematographic cameras' mechanical constitution

and cinema's special relationship to movement and time. They argue for a "pure cinema" based on "purely visual elements" whose subject matter exists, as Dulac argues, in "certain scientific writings, those which discuss, for example, the formation of crystals, the trajectory of a bullet, the bursting of a bubble (a pure rhythm, and what a moving one! Wonderful syntheses), the evolution of microbes, the expressiveness and lives of insects" (1932/1978: 47). By 1925, the pure cinema debate, operating alongside terms like 'avant-garde' in a constellation of concepts concerning non-narrative cinema, was, Richard Abel contends, *the* key discussion, at least in France. According to Abel, "So pervasive was the question that nearly every writer was forced to declare a position on it" (1988: 329). Pure cinema communicates meaning through form, not traditional dramaturgy. Its subject matter, as Tami Williams writes, is "movement and rhythm", "'*La Matière-vie elle-même*' (the material of life itself)" (2014: 153; emphasis in original). Pure cinema exists, Dulac explains, "beyond the limits of the human," concerned only with "nature, [...] the invisible, the imponderable, [...] abstract movement" (47).

"Th[e] school of the ungraspable turned its attention to other dramas than those played by actors", continues Dulac (Ibid.). Epstein also pursues this trajectory, writing that

If we wish to understand how an animal, a plant, or a stone can inspire respect, fear, and horror, [...] we must watch them on the screen, living their mysterious, silent lives, alien to human sensibility. The cinema thus grants to the most frozen appearances of things and beings the greatest gift in the face of death: life. And it confers this life in its highest guise: personality (2012/1926a: 295).

Epstein was particularly moved by cinema's curious ability to, as Pick says in 'Vegan Cinema', "enhance objects' impenetrability, rendering them solid, autonomous, more pronounced" (2018: 126). Yet in Epstein's theory, "Every aspect of the world upon which the cinema confers life is elevated only if it possesses a personality of its own" (1926a: 296).

What does Epstein mean by personality? "Personality goes beyond intelligence", Epstein says. "Personality is the spirit visible in things and people, their heredity made evident, their past become unforgettable, their future already present" (Ibid.). By contrast, intelligence coincides with data's rudimentary assimilation and regurgitation: machines display intelligence. Conversely, personality addresses beings' employment of knowledge about their past to make decisions shaping a future. This is not to say that machines cannot do this. As Epstein argues, cinema possesses a personality similar to all "superior objects," even as such a personality might appear fragmented given the cinematic apparatus's inclusion of a diversity of devices. However, cinema possesses a special genius unique, for Epstein, in the world of machines (2014/1946: 64). Why? Unlike telescoping, cinema does not just "amplify the work of the external perception of an organ" (65). Thinking, cinema offers opinions. In *The Intelligence of a Machine* (2014), originally published as *L'intelligence d'une machine* in 1946, Epstein investigates cinema's uncanny autonomy. "The cinematograph is among the still partially intellectual robots in which we discern the primordial framework of reason", Epstein says (66). Yet cinema does not merely copy human ideas. Quite the opposite, cinema inflects its recordings, even if directed by an anthropic hand or agenda, with a uniquely non-anthropocentric perspective resulting from its mechanical constitution. For Epstein, cinematic imagery was simultaneously shockingly original and startlingly inhuman, given human animals' unprecedented lack of autonomy in its production. We might tinker with a camera's knobs or dials, or even design a camera for a singular purpose, yet the cinematic image emerges from a technological body, and human animals are more than ever before severed

from the resulting artwork's creation (66-67) This book is, writes Christophe Wall-Romana in their translator's introduction, "a work on the philosophy of cinema", where cinema is a "thinking agent", catalysing new regimes of behaviour and thought (iv). We, Wall-Romana contends, "might read the book as a kind of prolonged thought experiment about what happens to thought when we take cinema seriously" (v). In Epstein's mind, cinema exceeds its designation as a step in photographic representation and technological maturity. Furthermore, its employment as an entertainment tool grounded in mimicking anthropic motion or experience does little to unlock its revolutionary capacity to produce radical perspectives capable of unsettling human animals' deepest beliefs (v). "Epstein considers cinema to be a uniquely hybrid form of thinking whereby humans, for the first time, collaborate with the non-human to craft better presentations—not representations—of how the world and humans truly are", Wall-Romana concludes, "propound[ing] no creed other than a broad-minded lucidity toward what our world and our lives are actually made of when cinema thinks them with us" (viii). Not only extending its makers' sight, cinema inflects its visions with personality, extending novel viewpoints we may reject or participate in.

As used by Epstein, 'personality' overlaps with 'subjectivity'. We apply these similar words to the diaphanous sparks setting beings apart, prominently manifest in idiosyncratic movements, gestures, and behaviours. Following Uexküll, we might contend that such biosemiotic locutions indicate internal worlds, alongside unique styles of thinking. Epstein himself synthesises subjectivity and personality, evocatively writing that

in the cinematographic apparatus [...] images are taken from the perpetually moving spectacle of the world—a spectacle that is fragmented and quickly cut into slices by the shutter that unmask[s] the lens, at each rotation, for only a third or a quarter of the

time that rotation takes. [...] [C]inematographic frames, considered in themselves, are thus a creation of the camera apparatus, a very inexact interpretation of the continuous and mobile aspect of nature [...]. In such an instance, a mechanism proves to be endowed with its own *subjectivity*, since it does represent things the way they are perceived by the human gaze, but only by the way it sees them, with its particular structure, which then constitutes a *personality* (1946, 13-14; emphasis added).

Living beings enjoy subjectivity. Cinema does, too. Ownership is verified when cinema contributes its unique perspective, thickening the gravities surrounding beings' Umwelten. Epstein called this proclivity 'photogénie'. Only certain aspects of others' characters lent themselves to such analyses: beings' 'photogenic' aspects. During filming, these were not only revealed, but elevated, their "moral character enhanced by filmic reproduction" (Epstein 1926a: 294). This capacity is unique to cinema. Consequently, photogenic analyses were the key, for Epstein, to cinematic specificity. Filmmakers must exclusively investigate beings' photogenic aspects, says Epstein, thereby "Avoid[ing] dealings [...] with historical, educational, novelistic, moral or immoral, geographical or documentary subjects [...]". [C]inema must seek to become [...] uniquely cinematic; to employ, in other words, only photogenic elements" (1926a: 293). What elements are photogenic? "I now specify, only mobile aspects of the world, of things and souls, may see their moral value increased by filmic reproduction" (294). No other art could relay beings' photogenic aspects because no other art operates in their dimensions, Epstein suggests. "Photogenic mobility is [...] mobility in both space and time [...]. We can therefore say that the photogenic aspect of an object is a consequence of its variations in space-time" (Ibid.). We might approach beings' photogenic aspects as Uexküllian carriers of meaning, semiotically abundant cues made available through dynamic movements rendered in time. They are the meaningful signs helping us

verify others' subjectivities, personalities. Importantly, "All life is covered with ordained signs." (Epstein 2012/1926b: 289) Like Uexküll, Epstein was invested in life's plurality, diversity, and equality. Even rocks, for Epstein, expressed their personality through moving in time. To "grow and unite, rocks make beautifully steady gestures as if they were meeting beloved memories. Under the sea, angel fish and those voluptuous organs, the secretive jellyfish, dance." (Epstein 2012/1926b: 289). For Epstein, signs appear through gestural momentum, manifest in stones' steady mobility, or a jellyfish's jiggle dance. Biosemiosis operates in these dimensions, whilst cinema has long been defined via its unique ability to synthesise movement and time. As Canudo writes in 1911, cinema is the "superb conciliation of the Rhythms of Space (the Plastic Arts) and the Rhythms of Time (Music and Poetry)" (1988: 59). Similarly, Epstein explains that, regarding "the elements of perspective employed in drawing, the cinema adds a new perspective in time. In addition to relief in space, the cinema offers relief in time" (1926a: 294-295). Biosemiosis and cinema intertwine, sharing constituent dimensions of operation and entangled identities, and even histories and origins, if we accept chronophotography as part of cinema's technological history, a type of proto-cinema.

Cinema's observational power derives from cameras' mechanisation. Epstein proposes that "The camera lens is an eye [...] endowed with inhuman analytic properties. It is an eye without prejudices, without morals, exempt from influences" (1926b: 292). In daily life we scan over meaningful elements, impaired by our conceptual biases, and industrialised modernity's breakneck rhythms. Cinema remains unlaboured by such inadequacies. However, Epstein did not overlook cinema's material dimension, aware of how cinema's "photochemical recording memory [...] shape[d] representations—that is, thought" (1946: 66). Cinema thinks with a mechanical eye and a physical body, too. Furthermore, for Epstein, time-lapse technology, for example, could tease out photogenic aspects beyond our

perception. “Astonishing abridgements in [...] temporal perspective are permitted by the cinema, notably in those amazing glimpses into the life of plants and crystals” (1926a: 294). Nevertheless, I contend that, if used to explore other beings’ temporal rhythms, temporal manipulation via time-lapse or slow-motion cinematography must be avoided. For example, time-lapse bulldozes plants’ temporal specificity, implying that plants’ worlds can be subordinated to human animals’ worldview, which is rendered exceptional. Conversely, I propose synchronising production to plants’ schedules by materially incorporating flowering plants into filmmaking processes, physically entangling flora and film. In this scenario, cinema aligns with vegetal velocities, not the other way round.

“Photogénie is the purest expression of cinema”, argues Epstein (1926a: 294). Is the inverse automatically true? Does cinema provide photogénie’s purest expression? In an earlier quotation, Epstein asks: where do we gather the images used to produce films’ illusory continuity? “These images”, Epstein concludes, “are taken from the *perpetually moving spectacle of the world*—a spectacle that is fragmented and quickly cut into slices by the shutter” (1946: 12; emphasis added). Prior to the cinematic spectacle there exists a more fundamental spectacle, coinciding with the rhythms of the earth. This we co-opt to produce cinema, appropriating extant, pre-representational energies; or, more appropriately, presentations of a raw, semiotic power: pure, immediate, unfiltered. The words we apply to filming consistently reference a pre-cinematic power that is ingested, later regurgitated, by cinema: we *capture, re-present*. This begs inquiry into a power preceding filming that could also be called cinematic. If photogenic elements are something filmmakers might seek out, capture, and represent, could we approach photogénie’s existence as preceding cameras’ arrival? Can we appreciate photogenic aspects without cameras’ intervention? When we speak of a ‘photogenic’ person, we reference a power preceding the act of visual capture, a largely ineffable, energetic invitation drawing us to photograph or film them, partially

revealing itself in their audiovisual likeness. Yet rendering photogenic elements, does cinema render itself redundant? If yes, cinema becomes an elliptical metaphor for something that precedes and exceeds it, namely living beings' cinematic qualities, manifest in their biosemiotic locutions rendered in movement and time.

Might we address cinema not merely as an industry or dense battery of gadgets, but a power coterminous with life we partner with in cinematic art? Anthropologist Eduardo Kohn proposes strikingly cinematic views of life, writing that “All life is semiotic and all semiosis is alive [...] the locus [...] of a *living dynamic* by which signs come to represent the world around them to a ‘someone’ who emerges as a result of this process. The world is thus ‘animate.’ ‘We’ are not the only kind of we” (2013: 16; emphasis added). Based on Kohn’s observation, we might say that we verify others’ possession of unique lifeworlds and internal points of view by their ability to relay meaning by moving in time. Cinema and life simultaneously converge and break apart. If cinema is more than an anthropogenic phenomenon then a pure cinema coinciding with *la matière-vie elle-même* (the material of life itself) would be enjoyable in the flowering plant, the wind in the trees, never only in films representing these events. A cinematic power, manifest in living beings’ biosemiotic vocabularies, precedes the event of cinematic capture and exhibition. “Why does one even need to imagine?”, wonders Epstein (1926b: 289).

Between biosemiotics and Epstein, we approach the end of thinking cinematically. This terminus is a junction, precipitating opportunities to produce a philosophy of moving images and deferential film practices whereby distinctions might be made between the *cinema* as an industry and *cinematic* experiences. With photogénie, Epstein grapples with an excessive power endemic to life, manifest in living beings’ biosemiotic locutions. *Qu’est-ce que le cinéma?*—what is cinema?—wondered André Bazin infamously. I propose one answer by investigating cinema not only as a machine or art form but a ‘power’, floating in the

world, actualised whenever beings make meaning by moving in time, approaching cinema as an industrial technology *and* an energy possessed by life.

Thinking cinema's conceptual and material termination in conjunction with the cinematic realm's superabundance and provisional infinitude is one of my central objectives. Epstein brings me here, communicating across a century, pertinent now more than ever. To conclude this literature review, through key Indigenous scholarship we met living beings as insightful teachers bearing environmentally significant instructions. Uexküll helped us comprehend how such beings might express their subjectivity by producing meaning through iconic, temporal bodies. Dulac and Epstein, through pure cinema and photogénie, helped us comprehend such biosemiotic locutions as inherently cinematic phenomena, inviting exploration of a pre/post-cinema cinema of nature activated through the common earthly gesture of moving in time. Examined alongside my key research questions, these areas of thought, explored in unison, offer answers to questions 1, 2, 3, and 4. Cinema is never simply, nor even predominantly, anthropogenic; nor has it ever been, and it will almost undoubtedly outlive the machinery we have designed to harness, capture, and capitalise on such a cinematic power. To recap, my key questions are:

- To what extent could cinema be conceived as not simply anthropogenic?
- How, and to what degree, can cinema help explore more-than-human forms of consciousness?
- What lessons do other beings offer cinema, and how might filmmakers implement them?
- How can we ethically justify cinematic production, given cinema's extractivist, destructive dimensions?

Consequently, cinema has never not been underway, fundamentally bound to life. The cinema industry provides one way through which we co-opt a more pervasive, elementary modality of cinematic expression, manifest in the “perpetually moving spectacle of the world” (Epstein 1946: 13-14), even revealed, as I argue in chapter 5, by the elements themselves. Furthermore, if living beings enjoy unique perspectives besides the ability to communicate; and if cinema, through, for instance, phytography, can translate plants’ experiences into registers legible to human animals, then cinema can help explore more-than-human forms of consciousness. Additionally, plants’ lessons of reciprocity, restraint, and gratitude are not only applicable to daily life, but cinema production.

Tailored to such instructions, cinema might become justifiable; or, Honorable. An Honorable Cinema’s shape remains to be seen. How filmmakers might implement bacterial, fungal, and vegetal instructions also remains unclear, as does the extent to which cinema might help explore more-than-human consciousness. To interrogate cinema’s relationship to an ecologically decimated and already cinematic world, I move to my central triptych of chapters. I begin with plants, following their gestural and phytochemical invitations into other domains of consciousness.



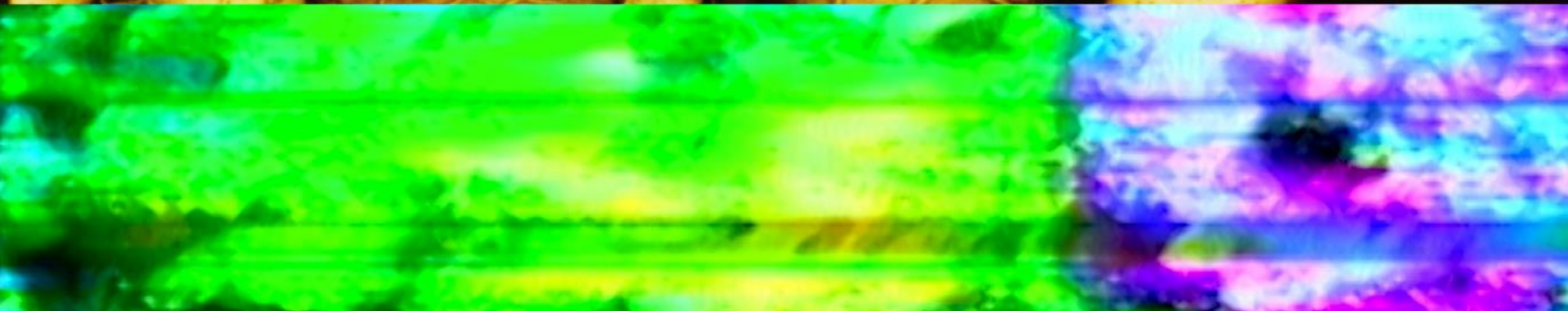
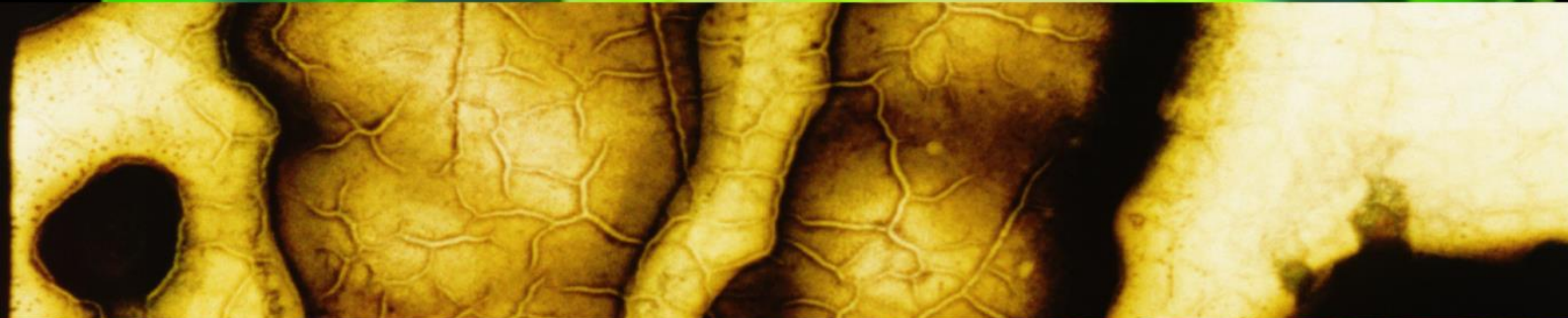
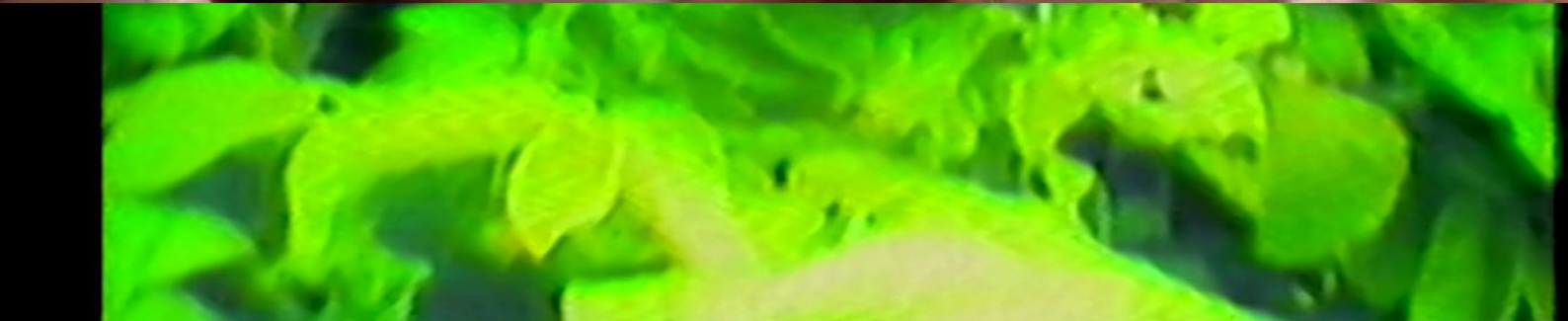
FOLLOW



THE



PLANTS



§ 3

When you know the fourfoil in all its seasons root and leaf and flower,

by sight and scent and seed, then you may learn its true name, knowing its being:

which is more than its use.

What, after all, is the use of you?

Or of myself?

(Ursula K. Le Guin 1968/2018: 18)

The short film *La Sensitive* (1914) displays a *Mimosa pudica*, captivatingly sensitive to touch. An *M. pudica*, anthropocentrically named shameplant after its bashful momentum, is subjected to experiments which trigger its reactivity. A tool is scraped across its leaves, provoking contraction. To conclude, the plant is encased by a glass bell filled with ether, precipitating anaesthetisation, leaves limp and dangling, returned to an inertia typically associated with vegetality. Alternatively, in Friedrich Wilhelm Murnau's (1888-1931) Weimar horror *Nosferatu* (1922), Professor Bulwer (John Gottowt (1881-1942)) lectures on plant carnivory. Bulwer examines *Dionaea muscipula*, the Venus flytrap. A fly, landing on *D. muscipula*'s jaw, is gobbled up. The snap-trap is sprung. The cavity becomes a stomach, dousing the fly in a searing cocktail of digestive enzymes, its tough exoskeleton corroded, exposing nitrogen-rich blood. *D. muscipula* eats like a creature, startlingly capable of digesting anthropic flesh, too. We do not see *D. muscipula*'s full culinary adventure, sometimes lasting 20 days. After the snap-trap slams shut, Bulwer's eyes deviously alight, and an intertitle appears: „Nicht wahr – wie ein Vampyr!“ Isn't it – just like a vampire! But why, as Matthew Vollgraff asks in 'Vegetal Gestures' (2018), "should the Venus flytrap provoke horror and dread in the viewer, as if it were some monstrosity in defiance of nature?" (69) Perhaps, Vollgraff proposes, we are disgusted not by the phenomenon of vegetal carnivory, but the plant's mobility and sensitivity. Perhaps the "plant's uncanny aspect lies precisely in this mixture of *kinesis* and *aesthesis*," Vollgraff wonders, "like the disquieting liveliness of the undead" (Ibid.; emphasis in original). Yet every plant moves, some more slowly. *D. muscipula* and *M. pudica* shock by synthesising movement (*kinesis*) and responsiveness (*aesthesis*), traversing boundaries separating 'non-life' from 'life'. Like vampires or zombies, they escape lifeless tombs into which plants have been interred, seemingly of their own volition.

The conundrum of plants' life/lessness and in/animacy are central to this chapter. Are plants' alive, or dead? If living, are they less alive than animals? At least in the west, plants, I propose, are conceived as inert resources, not beings worthy of respect. This view has precipitated environmental degradation and a radical devaluation of plant life, limiting the likelihood of earthbound futures capable of supporting creaturely life. To ameliorate these issues, we might learn to address plants as not consumable resources but recalcitrant subjects, maybe even instructive teachers. However, even if human animals' collective salvation cannot be achieved by saving plants, working to ameliorate plants' suffering is an ethical necessity, because plants are living beings. How can this be achieved? Cinema shows us a way.

Yet are plants fully alive, or merely semi-living, even simply dead? Synthesising plants and lifelessness may appear jarring, for plants often symbolise abundance, with gardeners frequently encountering plants as recalcitrant companions, sprouting up where not wanted, refusing to grow where desired. These two early films tell different stories, typifying understandings of plants over two millennia old, coinciding with ancient perspectives of plants as lifeless. A rising tide of artists, scholars, and scientists champion alternate views. This chapter investigates how cinema may partake in this budding revolution.

If, given plants' liveliness as expressed by their biosemiotic mobilities, we must care for them, how can we do so? What, precisely, does it mean to care for plants, and not just for our benefit? Why should we care at all? Questioning plant ethics is perfectly typical. Over two millennia of western thought has served to relegate plants to the status of supplemental resource. This tradition's achievements are numerous and pervasive. Consider this sample: unbridled deforestation; the regarding of plants as limitless bio-resources usable without violence, secular green messiahs; the proposal of herbivory as omnivory's sustainable, non-violent alternative; plants' incorporation in imperialist regimes of extraction, classification,

and taxonomy; plants' biological management in agricultural and medical science.

Accentuated by 18th century industrialisation, where plants' mass-consumption facilitated industrial proliferations, these interrelated phenomena speak to ways of acknowledging plants reaching back, in the west, to at least the 4th century BCE in Greece.

This list exposes a “failure to take into account vegetative life as life, aside from the external ends it might be called to serve” (Marder 2011a: 87-88), the belief that a plant is “no longer a living thing but ‘an incomplete thing’ [...] await[ing] completion in its being productively destroyed, utilized for higher human ends of nourishment, energy generation, and sheltering” (87). Consequently, Michael Marder calls plants “absolutely subaltern” (2012: 27). The ethical oversight of people enjoying wealthy lives names plants' condition. In the last decade, the disciplines of plant ethics, critical plant studies, and plant science have emerged, reappraising plants, and the vegetal turn has followed the animal turn, today well underway. But—why? Plants are finite and violable, threatened by habitat reduction and exceeding their instrumentalisation. Additionally, a majority of life will be extinguished if we fail to care for plants. As Martin Krampen states, if human animals “cease to care for plants [...] they will asphyxiate themselves” (2010: 276). Furthermore, Sylvie Pouteau argues that all energy on earth arrives by means of photons produced by the sun, with photosynthesis the primary means by which such energy enters the biosphere. Entry by means of photosynthesis, Pouteau continues, “can only be achieved through open, anabolic beings – that is, plants” (2018: 87). Consequently, ‘closed’ beings need to feed on open beings to access this primordial fuel stored within their bodies. In metabolic terms, catabolism is the ‘breaking-down’ side, whereas anabolism constitutes the ‘building-up’ aspect. Plants are one of earthly life’s architects. We require plants’ gifts, whether vegetal matter or oxygen, to survive. However, Pouteau forgets that, as mentioned in chapter 1, around 2.4-2.0 billion years ago, cyanobacteria, commonly known as blue-green algae, began photosynthesising, changing the

earth's atmosphere from a climate rich in nitrogen and carbon dioxide but practically no oxygen into an atmosphere abundant in oxygen. This was actually a horrific extinction event. At this point, oxygen was an alien gas which scorched many creatures' under-developed or non-existent respiratory systems from the inside out. Green plants evolved from endosymbiotic relationships with cyanobacteria, who thrived inside plants' bodies, sharing photosynthetic capabilities. Cyanobacteria flourish today, photosynthesising with plants. Pouteau's conclusion still remains true, as life subsists through plants' gifts. Marder speaks of plants as beholden to an "ontological generosity" (2018: 22). "More vividly than that", he continues, "we can consider how the vegetal *is* is a *yes* to the other so vehement as to hand plant essence over to the other" (Ibid; emphasis in original).

Yet if plants are reducible to their gifts, then taking fulfils plants' essence. Envisioning plants as what they give fails to ameliorate their extraction, possibly even accelerating plants' precarity. Celebrating plants for only what they offer, we instrumentalise them again. Plants must be appreciated for who they are, which exceeds plants' gifts. Learning to care for plants requires non-extractivist and non-instrumental thinking modes. Karen Houle writes that "if we only care about plants (trees for instance) because they perform the vital service of making oxygen, then the protection need not specify anything more precise than safeguarding a minimum amount of CO₂-fixing biomass" (2018: 70). Plants must be appreciated as individual parts of heterogeneous ensembles, not some undifferentiated mass. This means muddying the adage: we must investigate the trees *and* the forest. Magdalena Zamorska argues that plants, though "open, multiple, rhizomatic, clonal, decentralised and non-centric", enjoy a "singularity" and a "specificity" (2020: 139). All plants enjoy unique worlds. Caring for "floristic collective[s]" (142)—entangled groups of plants, like diverse woodlands or hedgerows or overgrown vegetable patches—is vital. However, we must also direct our investigations towards plants-as-people, not instruments.

This requires, Zamorska contends, attending to “the material, sensorial, corporeal, unique and singular life of a plant, and not of a species, a floral community or an abstract or generalised plant life” (143). Balancing specificity and community, individuality and collectivity remains key. Every plant is specific and situated, yet connected with other companions through radiating systems of relationships.

Yet how to even think about a being that “castrates metaphysics”, that “escapes capture and taming by philosophical conceptuality” (Marder 2011a: 86)? How to acknowledge beings that generally enunciate themselves through, as Marder puts it, a “certain pace and rhythm of movement [that] is too subtle for our cognitive and perceptual apparatuses to register in an everyday setting, and with which the tempo of our own lives is actually out of sync” (2013a: 21)? Arguably, what shocked viewers about *M. pudica* and *D. muscipula* was their rate or rapidity of movement. Plants do not operate below the threshold of our vision, like bacteria or fungi. Plants operate below our attention’s threshold. Many plants’ organic processes work at rhythms out of kilter with modern existence’s temporal demands. Synchronising with plants is a challenge of orientation. Consequently, I am captivated by filmmakers who subordinate themselves to plants’ rhythms along material and formal axes, even approaching plants as teachers.

In *Botanical Speculations* (2018), Giovanni Aloï calls for a new philosophy and a new, plant-oriented aesthetics, proposing that plants’ “ultimate alterity” requires aesthetic and philosophical reconfigurations. This alterity invites us to change how we look, occupy space and time, and even think (xxxii). However, plant-being is not an ultimate alterity because human animals share fundamental similarities with plants, like mutual needs for sunlight. Furthermore, we speak with plants on a day-to-day basis, as evidenced by Robin Wall Kimmerer’s account of the Anishinabek Skywoman story from chapter 2, or Edward Benton-Banai’s account of Original Man’s journey, also from chapter 2. Additionally, many plants

require, or at least thrive in response to, mammalian intervention. From one perspective, this statement might appear problematic, articulating human animals' supremacy and dominance over plants. From another, as touched on in chapter 1, it articulates transformative zones of connection and ambivalence for us to dwell within whilst contemplating our indebtedness and responsibilities to plants.

In *Why Look at Plants?* (2019), Aloi adopts John Berger's (1926-2017) seminal question 'Why Look at Animals?' (2015), originally asked in 1980, re-orienting it towards plants. "What we look at," Aloi contends, "and how we look, constitute essential parameters in the recuperation of 'alternate gazes' and the crafting of new ones—modalities of engagement that entail more than the ocular—modalities that can lead to a reontologization of the living" (xx). What one looks at, and the apparatuses that guide one's looking, constitute a world-forming system, defining the status of that which bears the look and that which does the looking. This usually functions negatively. But images can work for good. Alternate gazes, as Aloi say, may produce a "reontologization" of the living (2019: xx). In this chapter, I will explore how cinema can contribute to such developments. I advance 'plant-filming', a film practice attuned to plants and dedicated to the botanical. I develop this through discussions of artworks by Karel Doing and Charlotte Clermont. Here, vegetal agency does not precipitate shock. Conversely, plants materially and conceptually participate in filmmaking processes. Plant-filming builds on work by Marder in *Plant-Thinking: A Philosophy of Vegetal Life* (2013a), exploring forms of film practice carrying us and cinema beyond worn-out pathways of thought and practice.

I begin with historic conceptualisations of plants. I then consider plants' ontological specificity before highlighting deficiencies many cinematic treatments of plants exhibit. I conclude by exploring some contemporary media that encounter plants as subjects exceeding their use.

ALTISSIMA PAUPERTAS

ON VEGETAL POVERTY

In the 13th century, Thomas Aquinas (c. 1225-1274), in the *Summa Theologica*, wrote *vita in plantis est occulta*, “life in plants is hidden” (b. I, q. 69, art. 2), proposing that “The last echo of life is heard in the plants, whereby it is inferred that their life is life in its lowest degree” (b. I, q. 18, art. 1). Plants evaded Aquinas’s analyses, ostensibly “lack[ing] sense and local movement, by which the animate and the inanimate are chiefly discernible” (Ibid.). What would have Aquinas thought if he had seen *M. pudica* or *D. muscipula* in action? *D. Muscipula* counts as the fly’s feet tip-toe across its open maw, only moving after two quick taps, in order to avoid false alarms possibly caused by, for example, raindrops. Only then will the snap-trap smash shut with shocking rapidity. Would Aquinas have been stunned or fascinated, horrified or awed?

Marder suggests that Aquinas’s argument reaches back to the origins of Western philosophy (2011b: 470). Marder awards this accolade to Plato’s (c. 428-347 BCE) *Timaeus*, written around 357 BCE, which offers a seminal theory of the universe’s creation, as well as an account of how everything within it came to be. Marder contends that Plato’s argument operates through

the *inversion of the earthly perspective of the plant*, a deracination of human beings from their material foundations, their transplantation into the heavenly domain, and the correlative devaluation of the literal plant mired, with its roots, in the darkness of the earth as well as in non-conscious existence (2011b: 471; emphasis in original).

Marder analyses section 90a, which has been translated in many ways. Robin Waterfield offers this rendition,

As far as the most important type of soul we possess is concerned, we are bound to identify it with the personal deity that was a gift of the god to each of us. This, of course, is the kind of soul that dwells [...] in the summit of our body, and it raises us up from the earth towards the heavenly region to which we are naturally akin, since we are not soil-bound plants but, properly speaking, creatures rooted in heaven. For it is from heaven, where our souls originally came into existence, that the gods suspended our heads, which are roots, and set our bodies upright (2008: 95).

Earlier, Francis MacDonald Cornford says:

As concerning the most sovereign form of soul in us we must conceive that heaven has given it to each man as a guiding genius—that part which we say dwells in the summit of our body and lifts us from earth towards our celestial affinity, like a plant whose roots are not in earth, but in the heavens (1997: 353).

And before Cornford, Benjamin Jowett (1817-1893) writes

And we should consider that God gave the sovereign part of the human soul to be the divinity of each one, being that part which, as we say, dwells at the top of the body, and inasmuch as we are a plant not of an earthly but of a heavenly growth, raises us from earth to our kindred who are in heaven (1931: 513).

From most recent to oldest, these interpretations argue that human animals are not, are like, then finally are plants, albeit whose seeds are scattered elsewhere and whose roots grow in different directions. In Richard Dacre Archer-Hind's (1849-1910) 1888 version, plants curiously disappear. "God has given it to each of us as a guiding genius—[...] that which we say [...] dwells in the summit of our body and raises us from earth towards our celestial affinity, seeing we are of no earthly, but of heavenly growth" (337). Robert Gregg Bury's (1869-1951) 1929 translation mystifies in its clarity, as Bury contends that human animals are, simply, "a heavenly plant" (245).

This ambivalence exposes anxieties that have dogged western philosophy since at least Plato's time, specifically the impossibility of neatly distinguishing between animals and plants. Plato's student, Aristotle (c. 384-322 BCE), in *De Anima*, also investigated plants. Aristotle's *De Anima*, written around 322 BCE, inquired into the 'soul', synthesising biology and speculative metaphysics. Ostensibly operating through empirical analyses, it rests on philosophical presuppositions. Aristotle's soul is a system allowing things to perform the actions their kind may generally perform. Human animals are uniquely reasonable, possessing "power of thought and an intellect as well" (Aristotle, b. 2, 414b), enjoying the "intellect of the soul" (b. 3, 429a); or, for Aquinas, the "intellectual soul" (b. I, q. 75, art. 3).

Aristotle describes “an axe: [...] what-it-is-to-be-an-axe would be its substantial being, and this would be its soul; bereft of this, it would no longer be an axe except in name” (b. 2, 412b). Aristotle wields the soul to segment life into a triple hierarchy comprised of, top to bottom, human animals, more-than-human animals, and plants. This lets Aristotle define the soul as a particular style of life, and life’s gatekeeper. “[T]he ensouled differs from the soulless by being alive” (b. 2, 413a), argues Aristotle. Aristotle operates through the idea that beings may ‘be alive’ in many senses (Ibid.). By this Aristotle means some arbitrarily qualities—“intellect, perception, mov[ement], or [...] nourishment (including both growing and withering)” (ibid.)—he calls “potencies” (Ibid.). Through them beings express their soul-type and degree of life. Aristotle proposes a theory by which a hierarchy of life might emerge via analyses of beings’ behaviours. Plants are relegated to life’s lowest threshold, exuding only nourishment.

In *The Use of Bodies* (2016), Giorgio Agamben contends that “*De Anima* is probably the first text in which ‘life’ [...] takes on a generic sense, distinct from the life of the single living individual, from *a* life” (2016: 201; emphasis in original). With Aristotle, life appears as possessable to greater or lesser degrees, a logical inconsistency and a notion that has been decisive throughout western history. Its appearance and compartmentalisation refracts through plants. Agamben says that a “genealogy of the concept of *zōē*” (196; emphasis in original), the cumulative capacities of one’s internal organs, or, as Agamben puts it elsewhere, “the simple fact of living common to all living beings” (1996: 3), “must begin from the recognition [...] that in Western culture ‘life’ is not a medical-scientific notion but a philosophico-political concept” (2016: 196). Aristotle attempts to stratify and isolate life itself. Consequently, Aristotle seeks out a basic element, “the nutritive soul” (b. 2, 415b), by which life may first be attributed. This, contends Aristotle, is the original potency of soul that is shared by all living beings. The nutritive soul is the rudimentary potency which all beings

share with plants, and which plants uniquely express in isolation. As Aristotle says, “(We call ‘nutritive’ the partial kind of soul that even plants share in)” (b. 2, 413b); or, it is in “plants [that] the nutritive [soul] alone is present” (b. 2, 414b). In *The Open* (2004), Agamben explains how “what has been separated and divided (in this case nutritive life) is precisely what—in a sort of *divide et impera*—allows the construction of the unity of life as the hierarchical articulation of a series of functional faculties and oppositions” (14; emphasis in original). Human animals therefore approach perfection the more potencies they include.

For Aristotle, human animals must contain inhuman residues, that which they differ from. This is why Aquinas, considering the inconsistency as to “[w]hether besides the intellectual soul there are in man other souls essentially different from one another” (b. I, q. 76, art. 3), can, referencing Aristotle and Plato, conclude that

‘animal’ is predicated of man essentially and not accidentally; and man is not part of the definition of an animal, but the other way about. [...] We must therefore conclude that in man the sensitive soul, the intellectual soul, and the nutritive soul are numerically one soul. [...] Therefore, [...] neither is Socrates a man by one soul, and animal by another; but by one and the same soul he is both animal and man (Ibid.).

Aristotle confers on plants “some kind of soul” (b. 1, 411b), a “partial kind of soul” (b. 2, 413b); in Marder’s words, a confusing “lifeless soul” (2011a: 86). Neither Aristotle nor Plato read the Pentateuch (the Hebrew Bible’s first 5 books, known as the Torah), translated into Greek in the mid-3rd century BCE as the Septuagint. However, we find their perspectives in the Old Testament, during God’s first instructions to the as-of-yet unnamed “male and

female” (Gen. 1:27), the final event before Genesis’s first chapter terminates and “the heavens and the earth [are] finished” (Gen. 2:1).

And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in which is the fruit of a tree yielding seed; to you it shall be for meat. And to every beast of the earth, and to every fowl of the air, and to everything thing that creepeth upon the earth, wherein there is life, I have given every green herb for meat: and it was so (Gen. 1:29-1:31).

The idea that human animals may consume more-than-human animals only appears after the Fall, when Abel offers God “the firstlings of his flock and of the fat thereof” (Gen. 4:2-4:5). Dying is not referenced until God says, responding to Adam and Eve’s betrayal, “for dust thou art, and unto dust shalt thou return” (Gen. 3:19), or when God grows anxious about them eating from the tree of life and living forever (Gen. 3:22-3:23). Until Genesis’s fourth chapter, more-than-human animals, though operating under human animals’ dominion (Gen. 1:26), are not eaten, and as the serpent displays, may openly converse (Gen. 3:1).

Death is absent from this period of Judeo-Christian theology. This prohibition in no way pertains to plants who are “pleasant to the sight” (Gen. 2:9) and “good for food” (ibid.) for human and more-than-human animals, simply meat for both (1:30). The Pentateuch’s translation into English is notoriously challenging as Ancient Hebrew words rarely align with English ones. The Ancient Hebrew word translated into ‘meat’ is *äkh'läh* (‘*oklah*), generally ‘food’, specifically ‘object of devouring’. To devour, as Anat Pick explains, is “to ingest and digest the object until it is no more” (2018: 127). Devouring means eating something completely, ontologically and actually. Marder proposes that devouring means “consum[ing]

the temporal modalities and possibilities of vegetal life”, alongside vegetal matter (2013b: 186). Consequently, devouring plants means actually imbibing them and construing them as instruments, tracing plants’ highest value as their ability to satisfy an other’s appetite. God not only instructs human animals to eat plants, but *devour* them, rendering plants comestible instruments of creaturely satiation. During this beatific time, even in Eden, plants remain downtrodden. What does Christianity’s doctrine mean when it says that, alongside a time wherein more-than-human animals could speak in anthropic registers and human animals may actually see “the Lord God amongst the trees of the garden” (Gen. 3:8), “[o]f every tree of the garden thou mayest freely eat” (Gen. 2:16)? That plants possess exclusively instrumental values, subaltern existences destroyable according to the recurrent necessities of gustatory pleasure and fulfilment.

Roughly two millennia later, echoing Aristotle, in his key, 19th century work on when beings cease to live, French histologist Xavier Bichat (1771-1802) turned to plants as guides across the twilight zone between life and non-life. In July 1794, Bichat travelled to Paris, entering Professor Pierre-Joseph Desault’s (1738-1795) school, where “desperately sick people, drawn from the needy classes and required to offer their bodies, in life and in death, to the service of clinical medicine, in return for whatever care was on offer” (Bynum 2008: 55), were freely available. By 1797, Bichat was lecturing; by 1798, he had established the Société Médicale d’Emulation; by 1802, he was dead. Bichat’s death is mired in mystery, arguably precipitated by the long, dark nights spent inhaling embalming chemicals injected into his cadavers; or, conversely, a fatal slip down the stairs of the hospital. The gaseous miasmas and noxious fogs emanating from such materials of mummification might’ve scoured and toxified Bichat’s lungs unto death, but they did nothing to obscure Bichat’s clinical gaze, which fell precisely on plants. Bichat’s *Recherches Physiologiques sur la vie et sur la mort/Physiological Researches on Life and Death* (1827), originally published in 1800,

is key because, as Agamben says, Aristotle's concept of plants' nutritive life provides the framework by which Bichat is able to articulate the human animals' ascendancy by isolating and separating an 'animal life', which pertains to rational existence, from an 'organic life', which primarily articulates itself through the ingestion and excretion of organic materials (2004: 14). Mobilising Aristotle's ideas in a medical context, Bichat sought to isolate the phenomena by which life might be localised and hierarchicalised, facilitating modern science's and politics' obsession with life as a malleable, tangible element. Bichat carved life into two orders, 'animal' and 'organic', exploring their co-existence in anthropic bodies. Life, Bichat contends, occurs according to 2 principles. 1 exists within plants and animals alike, whilst another exists exclusively in plants. According to this perspective, plants are human and more-than-human animals' rudimentary background or framework. To jump between such categories, we need only introduce the capacity of perception, manifest in external organs capable of facilitating a meaningful encounter with the outside world (12-13). Yet these orders—animal and vegetable—“commence at distant epochs” (163). “[T]he organic life is active from the very first moment of our existence; the animal life begins after birth only” (133), superseded during the onset of natural death which extinguishes human animals' animal life some time before it terminates their organic life (163). 'Animal life' is rational, whereas 'organic life' is mechanistic, responsible for matter's scatological excretion and biological assimilation. Within human animals' bodies resides a ghostly remnant, localisable and verifiable through experimentation, of a rudimentary, vegetal energy. It is this residue that is clothed with external organs, and connected to an external world. Subsequently, plants are severed from their world, locked in tombs demarcated by their own body.

We find a medical response to the conundrum, which vexed both Aquinas and Aristotle, namely “[w]hether besides the intellectual soul there are in man other souls essentially different from one another” (Aquinas, b. I, q. 76, art. 3). Bichat's conclusions have

been decisive. For as Agamben points out, clinical contexts still rely on the separation of an organic life from an animal counterpart within the anthropic body prior to considering whether such a body might be abandoned to death, or otherwise sustained indefinitely (2004: 15). As Marder explains, in Middle Latin, “*vegetabilis*, meaning ‘growing’ or ‘flourishing,’ the verbs *vegetare* (‘to animate’ or ‘to enliven’) and *vegere* (‘to be alive,’ ‘to be active’), and the adjective *vegetus*, denot[ed] the qualities of vigorousness and activity” (2013a: 20); these describe vitality, vigour. Aristotle used ‘vegetative’ like this. Through Bichat, we encounter plants’ full perversion, their transformation from liveliness to deathliness. As Bichat writes, “If the animal life [...] be terminated gradually, [...] such pleasures will escape us imperceptibly, and the old man will have forgotten the value of life, when it is about to be taken from him; such destruction will resemble that of the vegetable only” (169). For Bichat, vegetality is a desolation, solely responsible for “assimilation and decomposition” (156), the “absorption” and the “[d]ischarg[ing] of urine and feces” (170). Bichat introduces the logic by which someone may inappropriately designate the comatose person as vegetative, comprehending how this supposedly diminutive state can be referenced to legitimate their termination.

This subsection has surveyed the origins of plants’ false poverty. Plato’s and Aristotle’s views significantly impacted the Bible’s construction, which depicted plants as life’s lowest expression, enshrining plants’ fictional poverty as part of a divine order. Later, through Bichat, plants’ lifelessness became not only a theological instruction, but a clinical reality.

The climate crisis partly derives from disrespecting plants and failing to preserve plants’ capacities to sustain life on earth. To begin tackling the climate crisis, we must begin caring for plants. This requires investigating plants’ creative and ontological abundancies, my next topic.

ALTISSIMA

DIVITIAE

ON VEGETAL

ONTOLOGY

Plants ground Gilles Deleuze (1925-1995) and Félix Guattari's (1930-1992) *Thousand Plateaus* (1981), a key work of contemporary western philosophy, appearing prominently in their discussion of the 'rhizome', arguably the scaffold of their whole project. From Deleuze and Guattari's perspective, rhizomes eschew linearity: "any point of a rhizome can be connected to anything other, and must be" (7). Rhizomes speak to heterogeneous, non-essential multiplicity: a "multiplicity has neither subject nor object, [it] cannot increase in number without [...] changing in nature" (8). Rhizomes constantly change through shifting mosaics of relationships: "a rhizome is not amenable to any structural [...] model. It is a stranger to any idea of genetic axis or deep structure" (12).

Plants embody Deleuze's and Guattari's concept. "Bulbs are tubers are rhizomes" (6). A key question they pose "is whether plant life in its specificity is not entirely rhizomatic" (Ibid.). This quotation brings us from the conundrum, interrogated by Aristotle, Aquinas, Bichat, and the Biblical authors, of plants' half-life, to the phenomenon of plants' vibrancy, articulated for Deleuze and Guattari through the biological formation and philosophical concept of the rhizome. "The wisdom of the plants", they continue: "even when they have roots, there is always an outside where they form a rhizome with something else—with the

wind, an animal, human beings” (11). “Follow the plants”, they tell us, “form a rhizome, increase your territory by deterritorialization” (11). “The tree is filiation, but the rhizome is alliance, uniquely alliance. The tree imposes the verb ‘to be,’ but the fabric of the rhizome is the conjunction, ‘and . . . and . . . and . . .’” (25).

Also called creeping rootstalks, rhizomes are axial plant sections, usually growing horizontally. In rhizomes, every point is a centre and agency is dispersed. Rhizomes facilitate asexual reproduction, typifying plants’ regenerative excellency. However, trees, like many plants, are frequently rhizomatic. Additionally, not all plants are rhizomatic. By contrast, tubers grow horizontally, unable to conduct asexual reproduction. Consequently, Deleuze and Guattari idealise plants, anthropomorphising trees. Not all plants are rhizomatic; trees are occasionally rhizomatic; and not all rhizomatic plants exhibit uniform behaviours. Their conceptual distaste for trees may derive from arboreal symbolism in arguments concerning top-down filiation. The ‘Tree of Life’ of Ernst Haeckel (1834-1919) and Charles Darwin, for example, as we will discover in the next chapter. These decisions stunt rather than elevate their inquiry. Vegetal diversity rejects the possibility of neatly organising beings into isolated categories. And with plants, the facts are generally stranger than fiction. Furthermore, Pouteau contends, “not all plants make rhizomes in a strictly botanical sense, but plant generative and regenerative potency can reasonably be subsumed by the general term ‘rhizome’: proliferative, net-like, connectively robust” (2014: 19). Plants help Deleuze and Guattari investigate alternate lifeways decoupled from a “logic of means and ends” (Deleuze and Guattari 21), different to the west’s transcendental, essential subject. They call this latter, problematic mode of being “arborescent” (Ibid.), contending that, conversely, “the rhizome is an acentered, nonhierarchical, nonsignifying system without a General and without an organizing memory or central automaton, defined solely by a circulation of states.” (21) At

question in the rhizome is a relation to life in general completely different from traditional, anthropocentric relations associated with hierarchical, arborescent perspectives.

Deleuze and Guattari's 'becoming' concept is key. Becoming is about contagion and ontological promiscuity. Later, Deleuze and Guattari qualify becoming as a "zone of proximity and indiscernibility, a no-man's land, a nonlocalizable relation sweeping up [...] two distant or contiguous points, carrying one into the proximity of the other" (293). Becoming does not connect beings as if in a sequence. By contrast, it mixes, conjugates, or pollutes them, "carrying them away in a shared proximity in which the discernibility of points disappears" (294). Pouteau, familiar with Deleuze and Guattari's work, may have had this quotation in mind when she wrote that "plants are essentially vanishing lines that start from nowhere and go nowhere. As a ferryman, they ever weave and thrive to re-create junctions and join together all forms of living and intelligence on earth" (2014: 21). Additionally, Marder, for whom the call 'Follow the plants' was particularly decisive, echoed Pouteau, defining plants as "passageways between diverse elements" (2018: 24). Pouteau continues, arguing that "the most basic law of plant life is unceasing synthesis and becoming and through becoming plants meet their most essential ontological requirement" (2014: 21). Similarly, Marder elsewhere defines plants as a "non-totalizable synthetic unity [that] spans divergent milieus outside of it" (2011b: 475). These quotations collectively interrogate plants' relationship to 'becoming', which is about plugging into other ways of being and changing through those connections. Becoming addresses beings as synthetic and non-totalisable, lacking boundaries. Plants eloquently express these elements, through their ever-foraging roots surfed by bacteria and pierced by fungi.

Furthermore, Marder calls plants "media for the exchange of gases, [and] in a definition [...], they are the tubes, the channels or the passages for the (inorganic) other they welcome in their acts of living", citing the "body of the plant" as the "register of this

incredible biological hospitality” (2013a: 33). Pouteau likewise addresses plants as “not a thing, [but] a process” (2018: 91); as “in fact hav[ing] neither an inside nor an outside” (2014: 19), rather being “beyond unity and dichotomy, beyond any Cartesian definition: simply beyond” (2014: 21). Following these observations, a ‘phytcentric’ paradigm, discussed in chapter 1 and proposed by Marder in ‘For a Phytocentrism to Come’ (2014), becomes hard to apply. Marder consequently disrupts his concept’s applicability.

Additionally, plants, especially but not exclusively rhizomatic ones, invite us to hover uncomfortably between definitions. Rushing to re-define plants, even as ‘open’ or ‘beyond’, blocks this opportunity, maybe even doing plants’ injustice. This does not mean we should ignore plants, overlooking their teachings. Rather, Marder’s and Pouteau’s conclusions make it hard to think about “the material, sensorial, corporeal, unique and singular life of a plant, and not of a species, a floral community or an abstract or generalised plant life” (Zamorska 143). In my version of ‘plant-thinking’ (plant-filming), we must think about what plants ‘are’, acknowledging that we will never know what that is. The question ‘what are plants?’ is simultaneously impossible to answer and supplemental to a rudimentary counterpart. Namely, that plants enjoy subjectivity. Like all beings, plants are never fully penetrable, withholding something extra in reserve. I prefer an approach beginning with observing plants’ behaviours and morphology. Accepting my failure to fully comprehend what plants are, I confine myself to observing plants and mapping their lessons, before applying them to being, cinema, and thought. When we ‘over-think’ plants, we risk transforming plants into reflections of anthropic thought. To ‘think like a plant’ is to encounter plants half-way, refusing to explore them as anything other than what they themselves invite us to think. Faced with the comment “plants are essentially vanishing lines that start from nowhere and go nowhere” (Pouteau 2014: 21), it becomes all-too-easy to forget that every plant, as expressed by various Indigenous perspectives, is always a real person, enjoying a real life, never something that

‘vanishes’, but someone that is right here: situated, sovereign, and communicative. Plants may pertain to becoming in particularly exemplary ways. Yet every plant is singular, specific, and material, occupying a smaller or greater slice of the earth, no matter how different their way of inhabiting that slice may be. Perhaps we should say that plants are not exemplary in their capacities to become, but exemplary in how they teach us about becoming. Becoming is ubiquitous. Plants just express becoming eloquently, through entangled ways of living.

Pouteau explains how “non-human(-like) entities like plants cannot be addressed on the same epistemic grounds as human beings and their animal kin: they require their own specific means of ethical investigation” (2018: 82). In an anthropocentric moral economy, plants would never accrue value. Consequently Houle accounts for plants through “an ethics of difference” (71), defined as “an ethics for and about plants which in no way derives from, or depends upon, similarity of function or value or morphology, to animals” (ibid). This is because plants “do not share” with animals “the same dimensions of being in the world” (Pouteau 2018: 85). Pouteau, after defining plants as ‘open’ beings (82), quotes Deleuze and Guattari, contending that “[i]n my view, subtractive multiplication at $n - 1$ emphasizes the fact that plants are open beings never completed and (potentially) endlessly coming into existence” (Ibid.). Pouteau is referencing this quotation by Deleuze and Guattari, employed whilst discussing the rhizome: “Subtract the unique from the multiplicity to be constituted; write at $n - 1$ dimensions” (6). In mathematics, n refers to whole, non-negative integers: 1, 2, 3, etc. Writing at $n - 1$ means operating beyond, or before, whole individuals. A dualistic being, for Pouteau, is closed. By open, Pouteau means non-dualistic. By dualistic, Pouteau means a being possessing a concept of inside and outside. By non-dualistic, Pouteau means a life “beyond [such a] dichotomy” (2014: 21). For Pouteau, plants’ non-duality is a biological fact. For example, plants do not undergo gastrulation, occurring during mammalian embryogenesis. As Pouteau explains, Gastrulation “consists [of] an invagination of the

embryo and the creation of an actual space inside: an empty tube” (19), which, as the internalisation of what was external, means that “[t]he inside of animal bodies [just] represents a subset of the outside wider world now hanging through the inside” (Ibid.). Houle also explores gastrulation, explaining how “the inside of animal bodies – mouth, cavity, throat, esophagus, stomach, intestines, anus – is the outside world turned inwards” (2018: 78). Gastrulation is unlike other embryogenetic processes, like cell division, because it does not produce duplication but a truly dualistic modality of being based on the presence of a division between internal and external space, localised within the body (2014: 19). Even seeds, wherein a “pseudo-inner space” and “local finiteness is achieved” (2018: 86), enclose only material for proliferation and “future development” (Ibid.). Pouteau explains how gastrulation might precipitate, at once organically and mentally, self-centeredness, manifest in a literal divide between world and self in a manner akin to the perspectives Cartesianism promotes (2014: 19). Therefore “the open character of plants [that] subsumes the essence of plantness [...] can be explained by an unsplit, undivided state of being” (2014: 19). However, even though plants probably enjoy different forms of awareness to us, plants are dualistic, yet not in a traditional sense. As Doing explains in an interview, “In the early stages of the embryonic development of plants a differentiation between root and shoot takes place. In terms of awareness, this could be described as a dualistic divide between up and down, light and dark” (2022, interview with author). Plants’ awareness is sundered between sunlight and water; darkness and underground nutrients; upwards and downwards momentum. Furthermore, plants’ modalities of existence frequently align with human animals’ and even cinema’s. Plants and cinema both emerge from darkness, whether unlit auditoria or underground soilscaapes, into the sun’s light, or the light of a projector’s bulb. Moreover, analogue film is similarly receptive to meteorological energy, analogous in some way to a leaf, recalling the cyclical procedures of vegetal regeneration which operates via duplication

and repetition with minor variation. Frame after frame, each inscribed with minor morphological differences derived from local atmospheric disturbance, cumulatively building whole artworks. Cinema, too, is photosynthetic. Ingesting light, it excretes imagery as a surplus. This luminosity binds us, agitating the silver in film whilst saturating the vegetal body, upon whose comestible grace we are fully reliant. Sunlight illuminates the synthesis of creaturely, vegetative, and cinematic nutritive regimes. This invites inquiry into whether human animals and cinema might emulate plants. I respond affirmatively, through cinema's becoming-plant.

We must also note that western human animals' dualistic beliefs, emerging with monotheistic perspectives, were inordinately heightened by René Descartes' 17th century philosophy, briefly explored in chapter 2. Doing argues that "we have invented self-centeredness. It is not a given trait that has morphological origins. [...] [F]or most of human history we have not been thinking about ourselves as immaterial minds embedded in material bodies" (2022). Furthermore, not all human animals regard themselves as disembodied. Certain Indigenous cultures (Anishinabek, for instance) breach the mind/body dualism. In an interview, Doing explains how "Through sustained observation and by pursuing a real and lived relationship with my direct environment I am hoping to capture and represent such a concept", continuing to say that

Instead of focusing on the differences between plants and humans [...] I have focused on similarities. A serious attempt toward communication has to start with shared values. Plants obviously care about light, water and chemical exchanges. The moment that I realised that there is an overlap between this and my film practice a world of possibilities emerged. Subsequently, I have explored and developed this idea step by

step, while accepting the fact that it is impossible to know anything with certainty about the plant's subjective experience. The only way forward is to approach the issue with care. I have tried to design my experiments in such a way that there is room for the plant's agency. The plants are my teachers, I am an absolute beginner, eager to learn (2022).

Nevertheless, Pouteau proposes that plants enjoy an essence (2014: 19). However, for Deleuze and Guattari, plants vis-à-vis rhizomes are deterritorialised. Rhizomes disturb the possibility of locating a stabilising principle or central essence. Though Pouteau's use of such terms might be primarily rhetorical, perhaps even addressing language's failure to acknowledge beings 'beyond' present thought, respectfully apprehending plants requires muddying normal ways of thinking and acting, a notion that Deleuze and Guattari tried to convey.

Plants, for Houle, can reconfigure the west's most entrenched principles. Houle calls this the "becoming of thought" (2018: 73), or thought's "becoming-plant" (2011: 111). Houle contends that human animals' styles of thinking and behaviour are determined and limited by our biology (2018: 75). Houle says that thinking "plant-thoughts shoves us in a better way than thinking animal-thoughts does," possibly instantiating a "radically different way of being in the world and thinking in, and as that world" (Ibid.). Similarly, as I said in chapter 1, dominant cinema and cinematic paraphernalia (cameras, projectors, auditoria, so forth) generally coincide with mammalian, specifically human animals', perspectives. Engaging in plant-filming, or filming like or plant, consequently requires new systems of making cinematic art and regimes of expression. As Houle contends, thought's becoming-plant may open a "posthumanist ethicality" that includes "a fuller range of our capacities as thinking

beings” and provide “an opportunity by which thought itself might mutate upon encounter (with plants, in our case) and might become” (2018: 72). Alternatively, as Marder says, when ways of thinking clash with that which utilises them, they might undermine that being’s very ontology, precipitating a possible correction by making who we are coincide with what and how we think. To subsequently think like a plant is to become a plant, since altering—even annihilating—how we think destroys that which separates us, in traditional thought, from other living beings. To think like a plant or engage, as Marder calls it, in plant-thinking is to therefore embark on the path of becoming-plant (2013b: 134). What of the filmmaker who not only thinks but makes like a plant, even partnering with plants to do so? Theory, say Houle and Marder, may become something else through respectful human animal-plant relationships. Cinema’s becoming-plant applies this to cinema. Both theory and practice can be transformed. Can cinema offer perspectives of plants beyond an anthropocentric subject position? Might cinema help us access plants’ perspectives?

The contemporary moment offers many artefacts for analysis. The ‘vegetal turn’ is underway in the humanities and arts. Critical plant studies, reframing plants as more than instruments for anthropic users, is gaining momentum. In ‘Writing the Lives of Plants’ (2020), John Charles Ryan explores forms of writing that may exhibit plants’ internal lives or translate plants’ writerly styles, also called “phytography” (98). This is not to say that plants have not been ever-present amongst the arts. Plants served key functions in photography’s and cinema’s origin. Like more-than-human animals, plants have been translated into symbolic registers, communicating meaning in visual, shorthand fashions. Nibbled fruit suggesting decay, as Aloi explains, or daffodils as a symbol depicting the continuation of love even after death (2019: 19). Generally, Aloi continues, the symbolic meaning bore no relation to the specific qualities of the plant (22). In western art, plants have nearly always been instrumentalised, an aesthetic offshoot of plants’ theoretical denigration.

Why are so many artists reevaluating plants? From one perspective, key work in critical animal studies has provided a framework to begin interrogating plants. From another, the exigency of the climate crisis has provided significant reasons to urgently explore plants' relationship to human history and animals' survival on earth. Aloi argues that we desperately need to generate novel ways of engaging with plants artistically that help us approach them beyond the reductive framework of instrumentalisation (2018: 16). Echoing Aloi, Pouteau contends that our understanding of plants can be impacted by both theoretical and artistic works, pointing to the importance of art (2018: 93). Pouteau consequently advances interdisciplinary exchanges between plant scientists, ethicists, and artists (Ibid.). Furthermore, Houle argues for "alternative ways to look at the very different 'lives and worlds' of the very different beings that plants are" (2018: 76). We are at a juncture where art can activate fresh trajectories. This returns us to Aloi's initial question, "Why look at plants?" (2019: xx). The next question, How to look at plants?, remains critically underexplored.

I have been thinking about *why* we should look at plants. Now, I switch to *how* we should look at plants. I will outline how plants have regularly been depicted in cinema. This lets me articulate how Clermont's and Doing's works typify new approaches to plants in cinema: plant-filming.

CAPTURING PLANTS PLANTS IN CINEMA

Various proto-cinematic media address plants, rooted in Victorian fascinations with vegetal mobility and life, posing questions regarding photography's and cinema's origins. Charles and Francis Darwin's (1848-1925) *The Power of Movement in Plants* (1880) develops sketch based time-lapse technology to study plants' rhythms, specifically "circumnutation" (547), growing plant organs' movements towards light or other nutrients, and "nyctinasty," (548) "the so-called sleep of leaves" (Ibid.). To study such phenomena, a glass needle was attached to a leaf, the needle's end dipped in wax. The plant was placed on a white surface, an initial dot marked for reference. The Darwins systematically touched the sheet with the needle, then connected the dots to evaluate plants' movement.

Furthermore, plants played key roles during photography's origin, as Britain's earliest photographers were botanists. In Britain, photography coincided with desires to produce easily duplicable, exact depictions of plants. An important figure is John Frederick William Herschel (1792-1871), primarily because he aided others. Herschel's research largely concerns introducing colour into photography by employing plant juices, a pursuit resulting in 'On the Action of the Rays of the Solar Spectrum on Vegetable Colours, and on Some New Photographic Processes' (1842). Anna Atkins (1799-1871), Herschel's neighbour, released *Photographs of British Algae: Cyanotype Impressions* (1843), the first book to be

illustrated entirely with photographs, and also *Cyanotypes of British and Foreign Ferns* (1853), a co-production by Atkins and Anne Dixon (1799-1864) (née Austen), Jane Austen's (1775-1817) cousin, exclusively comprising plant imagery.

Many early photographs were photograms. Like contact prints, photograms are produced with cameras by placing materials on photosensitive media and illuminating the ensemble. Contact prints differ insofar as they do not require light, as expressed by fungal spore prints. Atkins learned about photography from William Henry Fox Talbot (1800-1877), author of *The Pencil of Nature* (1844), a collection of twenty-four plates, including one of a plant. Graiwoot Chulphongsathorn argues that Talbot's "images of plant life departed from the anthropocentric and semiotic depictions of plants prevalent at the time" (2017: 55). Additionally, Chulphongsathorn continues, Talbot's experiments foregrounded plants' agency, even relying on them, primarily through the ways in which the plant body reacted with the chemical substances involved in the photographic process. "Though a human had to control the processes and experiments, Talbot's work stresses that nature itself has a writerly agency" (Ibid.). I believe that Chulphongsathorn's praise is slightly unwarranted. Consider Talbot's *Bryonia dioica*, from 1839. "The depicted specimen," writes Vered Maimon, "is centralized and arranged in a way that clearly displays its leaves, stem, flowers and spirals" (2015: 138). Flat, body and leaves splayed unnaturally, this plant, English wild vine, has been deracinated (dug up by the roots), posed to facilitate unobstructed analyses, its life prematurely extinguished. In Aloi's words, the specimen has been "aesthetically aligned [...] to the ontology of illustration" (2019: 16), made to satisfy literary illustration's demands, subordinated to the page's borders and lines of text. As Maimon continues, through its isolation within the space of the image and its reduction to a series of relatively colourless outlines, the plant stands alone, its world erased, inconsequentially forgotten (138). Talbot's image shares key similarities with Leonhart Fuch's (1501-1566) *Anagallis Mas*, a coloured

drawing of a scarlet pimpernel in his herbarium *De Historia Stirpium* (1542). Consequently, Talbot's "photogenic drawings" (Talbot 1844: 1) were, epistemologically speaking and beyond their production via light over pencil, nothing new, but simply botany by other means. Spatially and morphologically flattened, unjustly deracinated, chromatically muted, isolated and frozen, and deceased, Talbot methodologically and visually stripped plants of agency, ignoring vegetal dynamism.

Nevertheless, Talbot's image employed phytochemistry to impact photographic imagery. In *Bryonia*, tear-like marks line the plant's stem. These, as Maimon points out, resulted from a chemical interaction between the juices squeezed from the plant body and the photographic substances (139). However, it wasn't until August 30, 1840, after this print's production, that Herschel introduced Talbot to how plant juices might solve the riddle of imbuing photographs with colour (Schaaf 1992: 288). By 1841 Talbot had given phytochemistry little to no attention, remaining startled by Herschel's research. In a letter to Herschel, dated May 19, 1841, Talbot wrote that "the specimens of the effects of light on vegetable juices are very curious; it will be long ere Science will be able to account for all these anomalies" (qtd. in Schaaf 320). An anomaly, Talbot may have been aware of phytochemistry, but as a smudge on an image whose beauty descended from its fidelity to anthropic perspective, not a springboard for multispecies co-creation. Plants' writerly power was literally oozing between the gaps of Talbot's control. These etchings help us deviate from standard ways of looking at plants. Consequently, plant agency works in Talbot's image as a double sign of Talbot's inability and an act of vegetal resistance, a final rebellion enunciated by the body of the oppressed.

A thread, sieved through early photography, links recent ways of filming plants to ancient botanical interventions. Talbot enacted a unidirectional gaze and established the conventional relationship of camera and plant which remains largely unchanged. Imagery

may now move, but plants' treatment is thematically symmetrical. The two foremost ways of filming plants still figure plants from our perspective, and never on their own terms. During the following century, two different ways of imaging plants emerged, in cinema and through motion, today remaining dominant. Exemplary cases include one film from the 19th century's closure, the other during the heyday of Germany's Weimar period. On December 28, 1895, at Paris's *Le Salon Indien du Grand*, Auguste (1862-1954) and Louis Lumière (1864-1948) inaugurated their Cinématographe, displaying ten films, including *Le Repas de Bébé/Baby's Dinner* (1895), where Louis and Marguerite Lumière (1874-1963) eat with Andrée (1894-1918), the eponymous *bébé*, nestled between her parents. Occupying the foreground, the family's gastronomic adventure was seemingly meant to absorb attention. Purportedly, however, something else enraptured *le Salon's* crowd, namely the trees rustling behind Marguerite's head and the quivering plant behind Auguste's. Siegfried Kracauer (1889-1966), in *Theory of Film* (1960), wrote that "the contemporaries of Lumière praised his films—the first ever to be made—for showing 'the ripple of the leaves stirred by the wind'" (ix), whilst D. W. Griffith (1875-1948), director of *The Birth of a Nation* (1915), reminisced late in life that "'What's missing from movies nowadays is the beauty of the moving wind in the trees'" (qtd. in Keathley 2006: vii).

Thirty one years later, on February 25, 1926, at Berlin's *Piccadilly Kino*, Max Reichmann's (1884-1958) *Das Blumenwunder/The Miracle of Flowers* (1926) premiered. An idiosyncratic "unicum in cinema history" (Vollgraff 74), *Blumenwunder* begins with young girls violating a flower bed. Their play ends when Flora (Maria Solveg (1907-1993)) proclaims that the "flowers are alive just like you". This precipitates a feature-length sequence of time-lapse cinematography wherein plants, as Volgraff describes, grow and die "in fast motion, intermittently punctuated by mimetic interpretative dances" (Ibid.) by anthropic performers. *Blumenwunder's* ability to cinematically precipitate plants'

transformation from inertia to vitality was seemingly unprecedented, nearly reducing Max Scheler (1874-1928), German phenomenologist, to tears. Shortly after vacating the auditorium, Scheler wrote a letter to Marit Fürtwangler (1891-1971), his ex-wife. Scheler writes that “The natural impression that plants possess no soul vanished altogether” (qtd. in Vollgraff 79). In *Film as Art* (1957), Rudolf Arnheim (1904-2007) similarly argues that the “*Miracle of Flowers* is certainly the most fantastic, thrilling, and beautiful film ever made—in taking these shots it was shown that plants have expressive gestures, which we do not see because they are too slow for our minds but which become visible in accelerated pictures” (115). “Plants were suddenly and visibly enrolled in the ranks of living beings” (Ibid.), Arnheim concludes.

Plants’ rhythms, diverging from ours, gnaw at our schemas and test our ability to, as Pick might say, “let be” (2017: 48). An answer is to go faster. Attuning plants’ tempo to ours, cinema solves such enigmas. Making plants thrum to an anthropic beat, Reichmann wields cinema technology to register plants’ gnomic mobility. From our perspective, plants move relatively slowly. Cinema, beholden to capitalism’s clock, can rarely waste time by coinciding with plants. Consequently plants are regularly forced to coincide with us by being sped up. Early film theorists were startled by film’s ability to bring, through time-lapse cinematography, ostensibly static beings to appreciation, and inversely, to decompose mammalian motion through chronophotography, revealing things too quick to be perceived. As David Lavery explains, for early scholars, “[t]ime-lapse photography thickened becoming, made it visible” (2006: 1). Germaine Dulac also celebrates time-lapse, explaining how cinema helps us perceive the minor steps which contribute to major transformations, as in the case of a grain of wheat germinating. More elusively, Dulac celebrates time-lapse’s capacity to also reveal the psychological impulses and desires guiding living beings’ movements and gestures. In the case of a wheat grain, for example, we might chart such a beings’ Umwelt by

monitoring its gesticulations towards the light or air, as elements providing nutrients it needs to thrive (1978/1928: 32). Likewise, time-lapse, for Epstein, could help acknowledge “a sprout swelling up into an oak tree” (2012/1948: 374), a “grain of wheat germinat[ing]” (2012/1926: 389). As Chulphongsathorn highlights, for Epstein and Dulac, close-ups and slow-motion were also key techniques of non-anthropocentric revelation (56).

Reviewing *Blumenwunder*, Arnheim writes that “One saw that the same principles applied to everything, the same code of behavior, the same difficulties, the same desires” (115). As Vollgraff observes, “just as the film makes nature beat to a frenetic, inhuman pulse, it also reterritorializes the plants’ accelerated movements by suggesting anthropomorphic or theriomorphic analogies” (76). *Blumenwunder* enables plants’ coincidence with an anthropic register by forcing them to give up their own temporal specificity. Plants therefore accrue value to the degree by which they complement anthropocentric ideals. Consequently, I am theorising techniques of spatial and temporal distention and deflation as techniques of control. This is particularly true of plants, for whom kinetic and spatial experience is most likely extremely different from human animals’ perspective. As Marder, in ‘The Place of Plants’ (2015), contends, “a filmic alteration of the plant’s temporal rhythms, made to coincide with that of human temporality, is not free of the residual violence that takes place whenever alien frames of reference are imposed on a given form of life” (188). In *Blumenwunder*, one does not see plants enjoying their own time, whatever that is. One sees plants unjustly crammed into an anthropic temporality, abiding by alien rhythms. Value is disseminated to the degree by which plants satisfy anthropic ideals, something that nearly all plants struggle to do. Confusingly, when plants do synchronise with us, they register as monstrosities, as indicated by *D. Muscipula* and *M. Pudica*. This poses impossible requests, presenting to plant ethics a dead-end. An anthropic perspective is being imposed upon plants,

implying that human animals' perspective is univocal, that such a reality is the only reality. As an asymmetrical translation, some injustice, however residual, is always present.

Repas moves in opposing directions, advancing the value of extended duration by using a single, static continuous take. However, *Repas* does not technically 'slow down', by, for example, utilising slow-motion technology. *Repas* encourages *us* to slow down, facilitating a form of spectatorship and experience out of kilter with daily life's fast-paced demands. Slow down, *Repas* says, and plants' elusive life will appear. As plants generally express themselves fairly slowly, literally slowing down and pausing to acknowledge plants' momentum and gesticulations is important. To address plants, we must never rush, conversely adopting a speed more appropriate to plants' styles of growth and expression, which is at once hyper-mobile and glacial, coinciding with their sessile yet mobile character. However, there is so much more to vegetal communication, namely the exchange of chemical information and roots' adventurous perambulation. Importantly, both generally occur beyond our perception, operating constantly at startling speeds. Consequently, conceptually confining plants to a state of 'slowness' is an inaccuracy descending from humans' perspectival inadequacies. Given the widespread use of 'slow' as a pejorative, we should be doubly sceptical of its application to plants who, if anything, blend rapidity and steadiness, disturbing humans' desires to neatly organise time's flow.

Kracauer and Griffith point to *Repas*'s tempered aesthetic as honing attention, creating a zone wherein more-than-human beings may display agencies that normally go overlooked. This is cinema as antithesis to modernity's race, its capacity to wallow in time a balm to anthropic hyperactivity. Going slow, however, provides ultimately limited alternatives. As Marder argues, when attempting to connect with or represent plants, slowing down is a faulty tactic, because we cannot slow down enough to coincide with the speeds of vegetal growth (2015: 187). The best this can do is enable one to see plants in motion,

implying that plants' capacities to convey subjectivity resides exclusively in their ability to physically move. Iconic, bodily articulation is a key aspect of vegetal communication but it does not tell the whole story. Plants speak chemically, too. By merely 'slowing down' without attempting to explore plants' capacities to speak for themselves (e.g., through interacting with physical film), *Repas* sieves plants through our perspective, articulating their lack of a viewpoint or world. Moreover, by observing vegetal life from an exclusively anthropic perspective and rhythm, *Repas* entrenches anthropocentric perspectives concerning the exceptionality of human animals' viewpoint. That said, through extended duration, *Repas* helps us witness the significance of plants' momentum, which operates beyond anthropic concerns and modes of capitalist production alluded to by the film's central action.

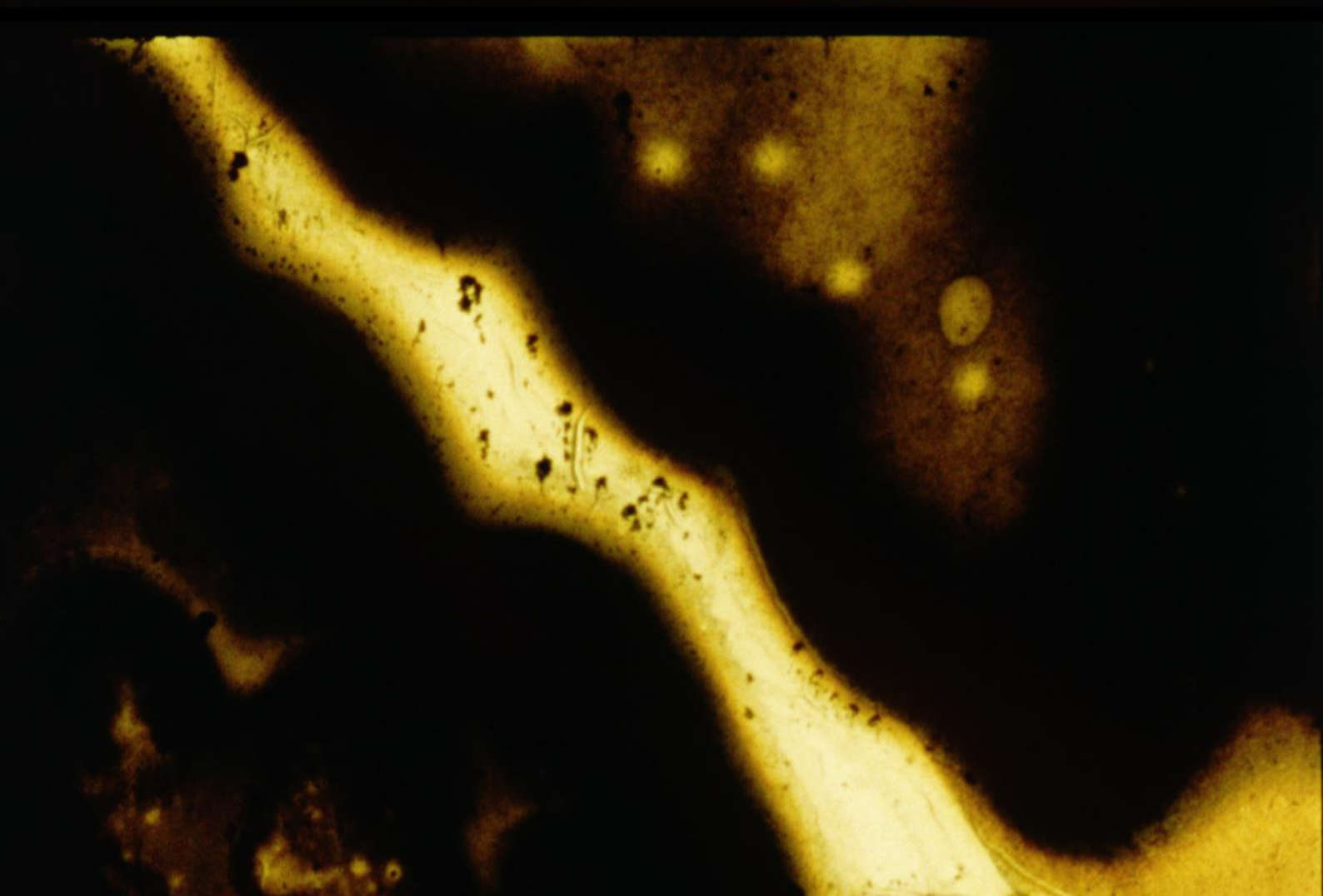
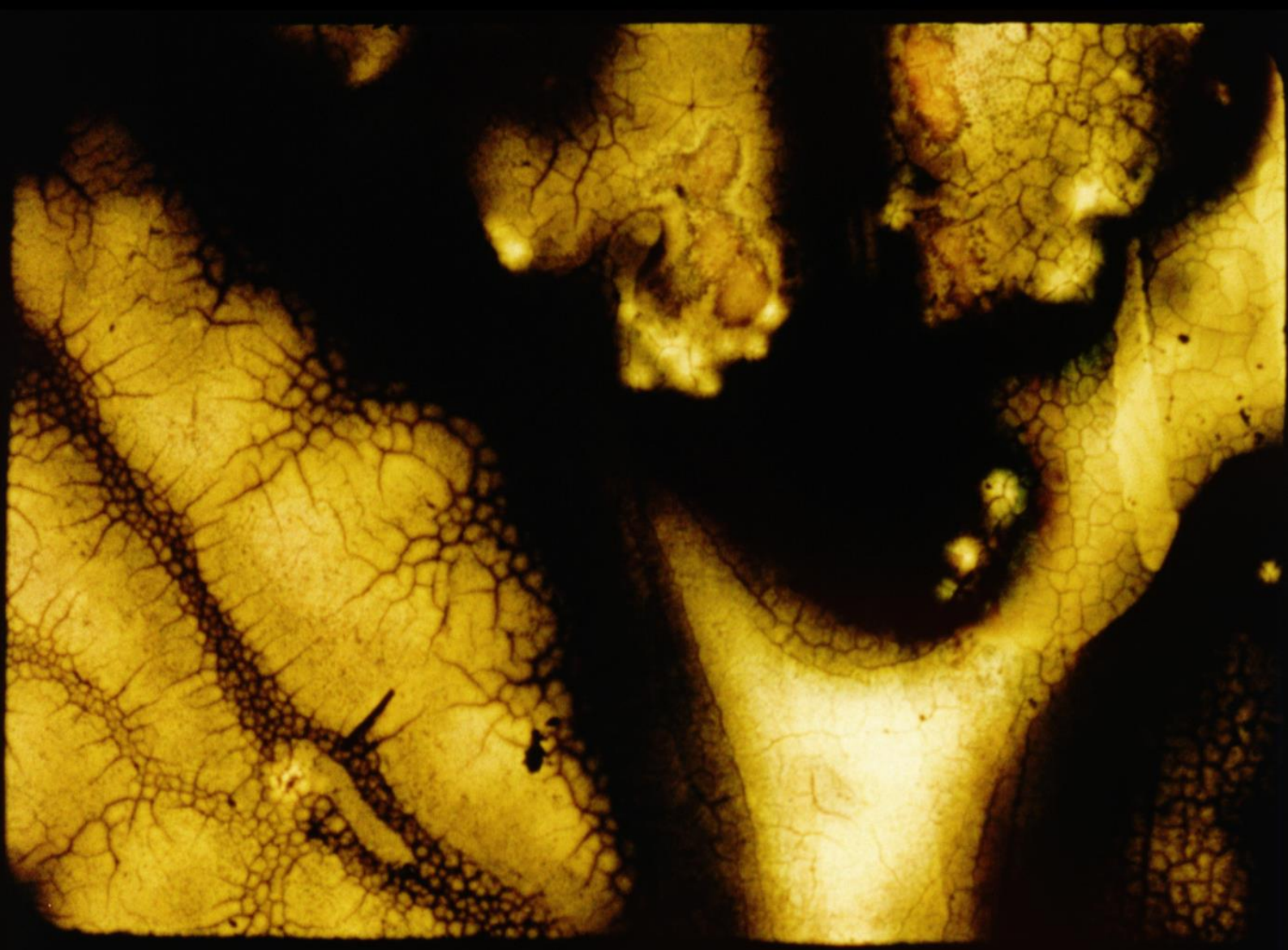
Nevertheless, I contend that extended duration provides merely one way of encountering plants, and, importantly, a method remaining grounded in anthropocentric vision and perspectives about plants—as *slower, lesser, reduced*. The film does not grasp beyond anthropic perception, tacitly articulating the exceptionality of an anthropic viewpoint.

Coinciding with the discipline of ecocinema, and through key scholarship by Scott MacDonald (2001, 2004), extended duration has, when encountering more-than-human life beyond the human animal, emerged as a key part of filmmakers' toolkits. However, extended duration, employed in isolation, might also entrench the exceptionality of anthropic perspective, suggesting that no other viewpoint exists. Consequently, I am interested in finding ways for plants to express their own viewpoint through cinema, and exploring plant experience in ways that do not refer back to humanity as a reference point, as 'slowness' risks doing. Furthermore, during *Repas*, as Pick has explored (2017; 2018) and as I mentioned earlier, viewers were enamoured with plants' movement, over and against the anthropic drama. Nevertheless, given the dynamics of framing (the family's centrality in conjunction with plants' background position), my instinct is that this re-direction of attention deviated

from the directors' objectives, typifying a conspiratorial connection between cinema and plants which emerges full-flower in the phenomenon of phytography. Furthermore, as I will explore in chapter 5, early viewers were captivated by plants' movements on screen because they had never seen living beings addressed by a medium operating in the shared dimension of movement and time, raising questions concerning plants' abilities to operate cinematically beyond cinema.

Based on these observations, I propose a difference between *methodological* slowness and *aesthetic* slowness which, though audiovisually glacial, does not automatically operate through reduced production schedules and speeds. Conversely, methodological slowness advances restraint, patience, and respect, generating processes whose temporal parameters and material contexts are determined through subordination to others' rhythms. Methodological slowness is a gateway for partnering with other beings operating at alternate speeds. Media flourishing through methodologically assenting to plants' sovereignty can be startlingly kinetic, formally communicating vegetal dynamism. Aligning with plants' rhythms requires more than formally or narratively slowing down.

Plants rupture every extant frame, demanding fresh modalities of audiovisual expression alongside experimentally subordinating cinema to plant dynamism. But is it even possible for cinema to offer space for plants to exhibit their subjectivity? My analyses provide one answer to this conundrum in plant-filming. Now, I explore some contemporary media and terms by which they may be theorised.



On previous page: Fig. 2, 3. *The Mulch Spider's Dream*.

These images, two stills from Doing's film, translate, as Doing proposes, a plants' experience of its world. Visually, they recall stained glass windows in the sun, or a lightning bolt streaking across a midnight sky. They contain and exude a beauty and familiarity that are hard to define, invoking, at the same time, an otherworldly quality.

This captivating ambivalence, I think, is productive, metaphorically communicating plants' similarities and differences. Plants lives coincide with but also exceed our own. These images relay such information, like postcards sent from another galaxy.

PHYTOSEMIOSIS

KAREL DOING'S THE MULCH SPIDER'S DREAM

We must investigate the methods, materials, and media employed to make any artwork, as the meaning of what is seen can never be comprehended without exploring its contexts of manufacture. This is especially true today, as working with analogue media is neither easy nor economically fruitful. Doing's *The Mulch Spider's Dream* is a media product to which this statement potently applies, for it is only through analogue film's specificity that Doing achieves his aim, namely broadcasting plants' subjectivity.

A trend exploring analogue film's capacity to communicate with earthly materials has seen film: submitted to the Atlantic Ocean; ensconced beneath some foliage in Fukushima, and bathed by the radioactive materials that have leaked from the Fukushima Daiichi power plant since its 2011 meltdown; subjected to a compost heap; buried, scratched, spat on, and even chewed by a dog; and slipped into a pond for over a year. Kim Knowles calls this "the aesthetic of contact" (2020: 81), a "refusal to conform to the conventions of visual recognition [by] open[ing] up the spectrum of cinematic realism to incorporate [...] traces of matter" (Ibid.). These films are often hand-made and –based, artisanal, and produced at the material interface of analogue film, human animals' corporeality, and the earth and all the beings it contains. Gregory Zinman, in *Making Images Move* (2020), offers an expanded idea

of ‘handmade cinema’ which makes room for more-than-human beings to participate in cinema production as collaborators through their capacity to materially intervene in analogue film’s physicality (2019: 115). These ‘handmade’ films interrogate the idea of authorship by showcasing how more-than-human beings and matter itself can creatively intervene in their construction (111). These comments triangulate analogue film’s ability to record physical abrasions, “kind[s] of writing” (Takahashi 2008: 45), on its body, and, through projection, permit earthly materials to “speak to the viewer” (61), a process wherein, as Knowles puts it, “new forms of experience and modes of contact with the world [may be] translated and celebrated” (2017: 260).

Doing’s work with analogue film pursues a novel possibility, at least in the west: plant-human animal communication (Doing 2022, interview with author). Doing attempts to explore “a real, lived relationship between humans and other species or ecosystems” (Ibid.), specifically plants. Doing’s methodology is “phytography” (Doing 2020: 22), pioneered by Doing yet including antecedents in Atkins’s, Herschel’s, and Talbot’s photographs, and an extant partner in photographer Tim Boddy’s contemporary ‘plant-prints’. Phytography is a way of making images by using phytochemistry and the plant body. How does phytography work? Many plants contain polyphenols, molecular packets like those within photographic developers. If soaked in a solution of water, soda, and vitamin C to encourage the release of their chemicals and placed against receptive media, plants can develop photographic imagery. Subsequently, if whole plants or plant sections (stems, leaves, or petals) are placed against surfaces after being appropriately soaked, imagery of plants’ bodies besides their chemical reactions with the substrate can form. Every morning, Doing entered an outbuilding, finding spiders’ webs suspended over developing trays. “I chose the spider as my intermediary arising empirically during my experiments that took place in a garden shed”, says Doing in an interview.

The filmstrips were left overnight and upon entering the shed the next morning spiders had woven their webs crisscrossing the small space. I was literally sharing my work area with spiders. It also seemed appropriate as we attribute all kind of emotions and craftiness to spiders while hardly being able to do the same thing when talking about plants. The spider in the title can be seen as a guide who introduces us to the vegetal realm (2022).

These webs metaphorically highlight the film's agenda to synthesise animal/plant experiential regimes. Where cinema technology is usually deployed to make plant temporality satisfying to an anthropic viewer, Doing worked otherwise, methodologically welcoming plants, slowly subordinating cinema to plant dynamism. Phyto comes from *phuton*, Greek for "a plant, a growing being" (Marder 2014). Gram, from *grámma*, meaning a character or letter, something drawn. Consequently, a phytogram is a drawing of, and by, plants: a form of vegetal autobiography. As Doing explains, the film was co-produced by Doing and "perennial plants from [Doing's] back garden: wild onion, ground elder and herb robert. Weeds from a gardener perspective, native plants from an environmental perspective, medicinal plants from a herbalist perspective" (2022). In *The Mulch Spider's Dream*, so-called weeds escape a negative designation by their own volition, showcasing creative abundancies by actively contributing to artistic generation. Exploring multispecies communication, Doing welcomes plants to convey phytosemiosis, the system by which plants express their subjectivity.

Doing's encouragement came from Thomas Nagel's article, 'What is it like to be a bat?' (1974). As Nagel writes, "My realism about the subjective domain in all its forms

implies a belief in the existence of facts beyond the reach of human concepts” (441). Nagel argues that “conscious experience is a widespread phenomenon” enjoyed by human and more-than-human animals and “countless forms totally unimaginable to us, on other planets in other solar systems throughout the universe” (436). Nagel contends that western science’s inability to qualify subjective experience has resulted in a disregarding of its existence outside the anthropic realm. Nagel explains how “the fact that we cannot ever hope to accommodate in our language a detailed description of Martian phenomenology should not lead us to dismiss as meaningless the claim that bats and Martians have experiences fully comparable in richness of detail to our own” (440). Following Nagel, Doing proposes that the “question remains if and how film, photography and sound can be used as tools to represent other ways of seeing, hearing and sensing. Or perhaps, even more radical, inspired by Nagel: can film, photography and sound be used to represent other mindsets?” (2020: 25).

This section hinges on a biosemiotic approach to plants, outlined in chapter 2, which allows us to approach plants as persons capable of communicating their relationship to a highly specific lifeworld blazing with significance. Krampen has argued that plants use their iconic bodies to communicate, “portray[ing] the forces of their environment through their meaningful form” (Krampen 276). Bodily articulation is a key phytosemiotic process, the sign processes, as Ryan explains, “including immunological responses and intercellular communication, [that] express the plant’s inner experiences of the world at the microscalar level of cells and tissues” (2020: 103) and the macroscale level of their body. Furthermore, phytochemistry is a key meridian. Suzanne Simard suggests that chemical signals, amino acids, hormones, and other compounds constitute “the language of plants” (2018: 201).

Plants interpret various stimuli to advance their flourishing: moisture and rain (Krampen 269); temperature, “gravity, water, minerals, chemicals, and alien roots” as well as light competition and the “relative stature and densities of their opponents” (Calvo and

Segundo-Ortin 2019: 66); stress, damage, and the presence of herbivory predators or a change in nutrient and water availability (Falik et al., 2011); and sun direction, darkness, barometric pressure, and “the volatile airborne and soluble waterborne chemical signals exchanged within their ecosystem” (Doing 2020: 26). Plants assimilate these factors, producing “structural changes at the level of [their] physiology [and] morphology” (Calvo and Segundo-Ortin 65). Consequently, in conjunction with growing patterns and gestural movement, phytochemistry may unlock plant sociality. Falik et al. have found that plants respond to herbivory by releasing chemicals capable of attracting the natural enemies of such herbivorous predators, and priming their endangered but undamaged neighbours to respond in ways that fortify themselves against oncoming and future attacks (1). Subsequently, Marder asks whether we should wholly instrumentalise a suite of beings capable of learning and communication? (2013a: 29) In these examples, plants, responding swiftly to stress, simultaneously suffer and save. Where human or more-than-human animal suffering regularly triggers sensations of pity or desires to care, plant stress—or suffering—seemingly leaves us indifferent, or curious at best. Yet do plants lack central nervous systems, or systems comparable to mammals? Literature following Marder’s article says no. Plant neurobiology, or “phytoneurology” (Calvo, Sahi and Trewavas 2017: 2859), has appeared as a field of inquiry. Paco Calvo and Migeul Segundo-Ortin write that plants’ cells can produce electric, hydraulic, and chemical signals which travel along vascular networks running throughout the entirety of the plant body. These signals, in conjunction with this complex network, facilitate rapid, coordinated reactions to environmental changes (68). Like Falik et al., Toyota et al. have also found that plants respond to stresses—like direct wounding or drought—with individual and collective reactions that call as-of-yet undamaged companions to prepare their defences (2018: 1112). As Calvo, Vaidurya Sahi and Anthony Trewavas state, “changes in behaviour to the signal [are] very much slower than the visible movement

common in animal responses, [yet] the initial signal detection [are] often at rates similar to those in animals” (2858). Calvo, Sahi and Trewavas call this “the phyto-neurological system” (2859), whereas Calvo and Segundo-Ortin propose the theory that plant cognition is partially realised through the actions of such a phyto-nervous system. They stipulate partially because plant cognition, like human animal cognition, relies on a triplet comprising environmental stimulants, the phyto-nervous system, and the plant body in its entirety (68; emphasis in original).

As mentioned in chapter 3, Eduardo Kohn argues that “all life is semiotic and all semiosis is alive.” (2013: 16) Life is the crossroads by which a living being emerges as a result of their ability to respond to a variety of more or less complex signs. Life, for Kohn, is semiosis, not the sum of arbitrary qualities, as Aristotle says. “If something enjoys a world, they have life. Semiosis,” maybe the only meridian by which “multispecies relations are possible [...] and also analytically comprehensible” (9), is the window via which we might verify this having. Phytosemiosis comprises gesture and phytochemistry, the dimensions by which phytograms are made. A vegetal language, phytosemiosis approximates, but is not reducible to, anthropic writing or speech.

Adequately conveying phytosemiosis requires a physical, chemically impregnated canvas where plants may scribe, and portions of time determined by plants. Analogue film offers these ingredients, plus animation. Animation is key. Though sessile, plants are never static, enjoying lives articulated through movement in time. However, individual phytograms could be called formally static. Yet individual phytograms typify dynamic human animal-plant encounters, infused with methodological momentum. Nevertheless, if Doing presented his phytograms as a series of static images he would have depicted conventional understandings of plants as inert. But Doing animates. Crucially, however, these are not separate images synthesised by a director who achieves animation. By placing plants at

various points on the strip, images are produced along the stock, and animation arises during production, expressed during projection. Plants are not an inert substance brought to life, rather producer and animator of imagery depicting plants awareness and communication. Doing calls this “immanent animation” (2020: 32), and we might theorise it as a way of helping plants participate in film production. Analogue film, handled mindfully, provides a fertile ground for plants’ self-representation. Its specificity complements plants’ style of communicating, synthesising animation with physical and chemical receptivity.

How images were made is important. How they look is key, too. Phytograms are mysteriously arcane, artworks, possibly indecipherable, by a consciousness both perfectly alien and thoroughly quotidian, a gift from another world yet born of this earth. Alongside confusing properties, phytograms synthesise familiarity and warmth. They are intoxicating, recalling a crackling fire or lava flow, or stained glass windows back-lit by glittery sunshine. Plant sections shimmer on the verge of recognition, whilst plants’ vascular networks fully appear. Warmly familiar and yet fascinatingly alien, they are uncanny, holding us in a space of hospitable unknowability. As the film progresses, imagery becomes slightly more recognisable. The image thrums wildly, a sparkling cosmos phasing in and out of obscurity. The image lurches, every frame presenting different configurations of vegetal matter and phytochemistry. Patterns recalling a plant’s corporeality gradually become discernible, yet stay slippery. These dynamic views refute anthropic tendencies to rhythmically subordinate plants, resisting the audiovisual repertoire by which plants are regularly imaged. The uncanny, kinetic imagery communicates plant dynamism, agency, and unknowability. Its beauty and familiarity convey plant hospitality and generosity, and the possibility of human-plant-animal communication. There are spiders in this film, too.

Doing employs direct animation, producing imagery by manipulating analogue film’s surface, bypassing anthropic figuration. Grounded, as Knowles comments, on

“[i]nterventions into th[e] complex gelatin layer” (2020: 102), an inquiry into the “mysteries and contingencies of [film] chemistry” (Ibid.), *The Mulch Spider’s Dream*, as *Doing* proposes, explores worlds “beyond the realms of photographic realism” (2022). Zinman contends that handmade films can be approached as “not only [...] a very specific mode of auto-portraiture or autobiography, but also an unacknowledged register of documentary cinema” (2020, 108). Consequently, resulting from physical and chemical processes impressed upon a medium enjoying a material, indexical relationship to its production contexts, *Doing* presents arguments for plants’ realities that are hard to discredit. Challenging anthropocentric perspectives of reality, *Doing* explores alternate subjectivities through analogue film, a medium capable of retrieving documentary images from others’ worlds. Furthermore, *Doing* utilised unexposed film because phytography requires film unaffected by chemistry. We do not see a pre-existing image that has been negatively degraded. We see a new image created by plants. Plant agency registers as a positive, creative act, not a negation.

As a direct animation, the distances between viewing perspective and filmed subject are uniform and reduced. Viewing is honed and static. Each frame includes only plant portions, derailing scale, blocking human animals’ tendency to map. Plants’ stems and vascular networks incessantly move, evading inertia. Leaves bisect the frame, incoherently overlapping, phasing in and out of legibility. The film constantly evokes a close-up, a technique famed, as Knowles writes, for its “decentering and defamiliarising capabilities” (2020: 87), making “details and textures [...] more pronounced”, causing “traditional perspectival reference points [to] fall away” (Ibid.). James Leo Cahill suggests that “the magnifying close-up [...] dissect[s] but also displace[s], [...] swerv[ing] between recognition and an estranging reorientation” (2019: 77). Close-ups comprise “a different cinematographic scalar anatomy” (84), magnifying the physically minor and dissecting the optically major. Knowles explains how the close-up “questions conventional modes of bodily representation

but also explores an alternative language of the close-up that aligns it with the world of small things” (2020: 88), raising “matter” by employing “the repertoire of things worthy of representation” (Ibid.). Béla Balázs (1884-1949), in *Theory of the Film* (1952), praises close-ups, which show “your shadow on the wall with which you have lived all your life and which you scarcely knew” (55), exposing “the hidden mainsprings of a life which we had thought we already knew so well” (Ibid.). Walter Benjamin (1892-1940), in ‘The Work of Art in the Age of Mechanical Reproduction’ (1968/1935), argues that “The enlargement of a snapshot does not simply render more precise what in any case was visible, though unclear: it reveals entirely new structural formations of the subject” (16). For Benjamin, the close-up is not about heightening significance, but disorientation and revelation. Importantly, *Doing* is not actually employing close-ups. Direct animation produces perspectives aesthetically echoing close-ups whilst deriving from methodological commitments targeted, in *Doing*’s case, towards deference to more-than-human collaborators. *Doing* employs the close-up’s capacity to disorient and reorient, exploring the technique’s non-anthropocentric possibilities. *Doing*’s use of direct animation displaces the viewer, introducing us to plants’ worlds that are cinematically magnified and structurally posed as significant.

Doing’s use of the close-up form does not produce higher degrees of comprehension and fidelity. *Jittery*, the film staggers, registering beneath the threshold required to produce linear motion, a profusion of slippery images from start to finish. Abstraction can operate positively, expanding viewers’ capacity to welcome an enlarged world, thick with new meaning. Filmmaker Carolee Schneemann (1939-2019) says that our “best developments grow from works which initially strike us as ‘too much’; those which are intriguing, demanding, that lead us to experiences which we feel we cannot encompass, but which simultaneously provoke and encourage our efforts” (qtd. in Zinman 2020: 15-16). For Zinman, abstraction may precipitate an increased proximity to the world. By overwhelming

us mentally or sensorially, abstract art can expand or elevate our understanding of the world (16). Speaking about his film *Underground* (2001), made “by literally burying pieces of black film during different periods of time and in different kinds of grounds (soil, snow, mud, etc.)” (2001) so that bacteria could engage with them, Emmanuel Lefrant contends that the “point is, paradoxically, to reach the extreme of realistic representation by way of an abstract image” (Ibid.). Lefrant recalls Zinman’s comments about “unacknowledged register[s] of documentary cinema” (2020: 108) and Knowles’ ideas concerning realms “beyond [...] photographic realism” (2020: 102). Abstraction expands, leveraging our disconnection from standard regimes of mental and visual perception. However, phytograms are only abstract if we do not approach them as realistic, material postcards sent from others’ realities. Echoing Nagel’s pursuit of a “Martian phenomenology” (1974: 440), a more accurate descriptor of Doing’s imagery would thereby be alien. This does not negate phytograms’ power to disrupt entrenched perceptions and offer startling new sights.

The Mulch Spider’s Dream’s trajectory, from obscurity to increased familiarity, is telling. Doing attempts to explore a shared human animal-plant semiotic realm. In an interview, Doing contends that

In order to succeed, I need to persuade my audience to step out of their comfort zone and follow me on a rather uneven and winding path without clear destination. The reward is that this path is eventually more familiar to us than we might expect.

Beneath the shiny and well organised surface of Cartesian dualism an adventurous, seemingly unintelligible experience awaits us. When you don’t know how to find your way through, a possible way forward is to simply jump into the mud, or in this case, the mulch (2022).

Mulch is illuminating, yet simultaneously mulch obscures. Organic mulches are layers of living material placed over soil, locking moisture in the earth, blocking excess sunlight, and providing slow-release food for local beings. Worms carry mulch downwards, networking stable soil structures, whilst insects lust over decomposing mulch. An increased insect community attracts birds, whose guano nourishes the landscape, their bodies also offering vehicles for fungal spores. Mulch helps generate robust, multispecies ecosystems. Mulch, and mulching, offers a prism to investigate Doing's method, the forms inside *The Mulch Spider's Dream*, and its extra-textual impact. Watching the film is like perceiving mulch from above: leaves fly by whilst plants' vascular networks scan as if lit from sunlight cascading through the canopy. We have seemingly adopted an inquisitive spider's perspective, diving into the mulch. Doing's soundtrack also brings us down into the mulch. We don't hear the soundtrack as much as we feel it, a thrumming, vibrating, crunching cacophony reminiscent of a spidery tip-toe walk over snapping twigs and springy duff. Furthermore, phytography can be conceived as an act of mulching. Plant matter was laid over analogue film, producing an environment where anthropic viewers might encounter plants as creative subjects, not resources, thereby increasing plants' flourishing, albeit thematically, in a manner akin to laying organic mulch over a garden. Often, gardeners employ synthetic mulches, plastic sheets designed for weed suppression. These leak micro-plastics, polluting soils. However, Doing lays organic mulch over plastic film, introducing a nourishing organicity into film's industrial body. Moreover, Doing intentionally employs 'weeds'. An inorganic mulch of plastic film has failed to eradicate every 'weed', who artistically proliferate on a plastic substrate. Lastly, Doing employs harvesting strategies designed to galvanise plants' proliferation. One of the many wonders of plants is their regenerative excellency. When extraction is done with care, these energies can be stoked, not curtailed.

Doing has explored the similarities between plants and human animals, not the differences. The film's mystifying imagery, however, never fully settles, elusive to the conclusion. It continually signifies beyond human animal perception, occupying a deterritorialised zone, holding open an undetermined futurity. This brings us to Doing's open form. Doing disregards dominant viewing conditions, comprising one-way communication between audience and screen. A live projection, exhibition becomes an evolving phenomenon, never truly achieving completion. Though stable forms might emerge during projection, these will change between iterations as evidenced by Doing's exhibition at the Lumen Crypt Gallery in Bethnal Green, London. Curving walls warped the image, introducing novel viewing conditions. As Scott MacKenzie and Janine Marchessault might say, we can approach Doing's film as not "a fixed entity but instead something in constant change and movement—in a process of becoming" (2019: 3). Alternatively, borrowing Zinman's words, it "do[es] not merely exhibit political engagement through content—[it] describe[s] a mode of deeper philosophical inquiry regarding the role and position of humanity vis-à-vis the world through methods of production" (2020: 121), and exhibition, too. Trying to communicate with plants, Doing allied with analogue film, which Knowles summarises as "a complex combination of elements—an amalgam of vibrant matter whose chance constellations lead to a continually changing granular makeup" (2020: 73). More than just "a reflection of the world" (Ibid), analogue film is irredeemably "of the world—[it]s visual form resulting from the physical transformation of matter" (Ibid.). Doing practices openness, patiently welcoming, in Zinman's words, "the variability and indeterminacy of specific groupings of organic and inorganic matter that emerge as an opening up of possibilities in a specific time and place, and to specific ends" (2020: 120).

Nagel says that the contention that subjective experience is more likely than not ubiquitous across the cosmos should be read as a provocation to develop a method

independent of the imagination. The goal of such a methodology would be to reveal alien subjectivities to beings incapable of having such experiences (449). Even as it requires intense degrees of imagination, Doing's approach is one of these potential methods, an example of a revolution in contemporary experimental cinema I am calling plant-filming, possibly even triggering cinema's becoming-plant. To reiterate Houle's concept of 'becoming-plant', becoming-plant occurs when we enter into alliances with plants which stimulate plants' abilities to reveal their unique subjectivities. This is the first stage of becoming-plant, with later stages occurring when we affirmatively respond to plants' newly perceived sovereignty by adopting their characteristics or traits, or otherwise allowing plants to impact our lives (2011: 97). Resulting from a metamorphic, heterogeneous alliance spanning human and more-than-human, allowing plants to express their unique forms of consciousness by translating phytosemiosis into a legible register, Doing's film operates as one of Houle's particles. Hannah Stark considers Houle's concept, stating that "becoming-plant would be a vegetal becoming which would take us away from the conventional understanding of sentience, to new forms of relation and growth" (2015: 188). *The Mulch Spider's Dream* works in this way, introducing cinema to new ways of relating to other beings, and regimes of more sustainable growth. It has the capacity to produce, as Pick might say, "new relational trajectories" (2015: 227): new ways of relating to other entities and new ways of understanding how those entities possess and relate to vibrant lifeworlds they create and enjoy.

Made with defunct film from the 1980s, this a fragile film about fragility. Many artists turn to handmade, artisanal practice to produce in less destructive ways. As filmmaker David Gatten puts it in an interview with Zinman,

The way one has to make sprocketed film in the twenty-first century is so slow [...] and I want to be slowed down by my process. [it is about] how I want to live, how I can most align my art-making practice in the studio with how I want to live the rest of my life, which is slowly, and quietly, and with consideration (qtd. in Zinman 2020: 7).

Similarly, Doing says that “In my own practice [I have] strive[d] for an economy of sufficiency, while seeking relationships based on kindness” (2022). Part of film’s specificity comprises susceptibility to destruction. Composed of earthly materials, film can decompose, too. Knowles argues that artisanally employing analogue film may positively coincide with encountering “earthly fragility, as the urgent calls for more ethical and responsible forms of living extend to the kinds of images we create and how we create them” (2020: 74). Doing’s film tries to live the story it tells, about more compassionate ways of being in the world, pursuing more sustainable ways of existing alongside—with, not above—plants.

Cinema’s becoming-plant names cinema’s metamorphosis to the point of coincidence with plants. Maybe an impossible process, it requires the transformation of nearly every modality through which cinema is produced and enjoyed. It requires learning from plants, assimilating their teachings into daily life. It requires, as Doing proposes, “trying to find a way forward” by following plants, accepting “plants [as] teachers” (2022). Yet, as Doing simultaneously writes, “I [am] not [...] innocent, I am part of the whole mess that we have created” (Ibid.). Doing’s film ingests gelatin, supporting routinised slaughter. Doing’s methodology, however, advocates processually slowing down, processually respecting others’ rhythms, sustainably producing artworks enabling multispecies futures. Doing wilfully coincides with earthly beats, refusing to force others to abide by anthropic clocks. Doing invites us to encounter plants through non-anthropocentric registers, utilising this

knowledge to disengage human exceptionalism and inquire into alternative styles of existence exhibited by plants.

This film suggests that plants have a world, and that vegetal communication is legible to human animals. This proposes that plants be encountered as not inert resources or semi-conscious pseudo-beings, rather subjects exceeding their instrumentalisation. Here, a shared register may be explored and restoration may possibly begin. Doing has followed the plants in the pursuit of a contemporary human animal-plant relationship based on recognition and respect. Doing began with a speculative question concerning plant subjectivity, took plants' experience seriously, and conducted some cinematic experiments exploring how these ideas might become more comprehensible to anthropic viewers. Doing may not fully instantiate cinema's becoming-plant. But Doing moves in the right directions. Borrowing Zinman's words, we may approach *The Mulch Spider's Dream* as "an object lesson in the experiential knowledge of the non-human—one that, in its making, transcends rational, analytic processes" (2019: 110).

PINK SKY, ORANGE LAWN

CHARLOTTE CLERMONT'S PLANT DREAMING DEEP

Can plants be followed in other ways? *Plant Dreaming Deep* (2017) by Clermont displays an answer. Clermont's unique methodology incorporates recognisable images, exemplifying formal repertoires coinciding with mainstream film practice. Clermont does not shy away from employing camera movements, musical soundtracks, archival material, even written words. This is not to say that Clermont's video comes close to popular ways of imaging plants.

Clermont's methodology may help rupture the systems setting the standards according to which plants are regularly understood. I approach this through Judith Butler's scholarship, a key figure in debates concerning identity, even though Butler, as far as I know, did not write about plants. However, Butler's arguments concerning how we might challenge culturally dictated identities can be applied to investigate how we might disrupt plants' traditional identity of inertia and non-consciousness. In *Bodies That Matter* (1993), Butler contended that "identification is always an ambivalent process" (126). Identifying with a certain identity, we relinquish our access to others. Inhabited identities thereby always include an excess, what remains unchosen. Consequently, Butler calls normative identities "internally unstable affairs" (Ibid.). If inhabited, this excess can signify or produce meanings

that do not perfectly align with an intended referent (122), and relate to cultural norms in ways that contradict their command, derailing identity's legitimacy (139). Butler saw potential in drag, the parodic mimesis of gender norms. Yet drag is not inherently subversive, possibly even entrenching the authenticity of heterosexual gender norms (125).

Consequently, Butler considers drag as occupying a site of ambivalence, one in which we might resist and trouble the legitimacy of the dictate that commands us to abide by a specific gender or norm (Ibid.).

We have seemingly left plants behind. Yet plant-filming, enacted by Clermont, introduces us to plants' alternate identities, the excess beyond present concepts. I apply Butler's scholarship because Clermont's video engenders ambivalent plant-human encounters. A successful parody signifies identities' non-essentiality, highlighting their application by external forces. Visualising identities' excess may curtail the dictate that legitimated them. Butler tells us that the identifying subject occupies a paradoxical "non-space" in which the imperative to express the signs and gestures capable of constituting a specific 'I' or 'we' are keenly felt and followed, yet such terms can never be perfectly adhered to. This non-space, localised within a signifying subject, manifests as a space of not only tension, but ambivalence. For if the signifying subject elects to reject the appropriate cultural norms, then such norms have failed to assert their essentiality, and their claims to sovereignty might be thrown into question (124). Consequently, by creating a viewing scenario in which we might simultaneously look at plants in contrasting ways, we might place two views of plant identity in communication, making room to reflect on how plants exceed their standard designations. Clermont seemingly collapses diverging theories of plants into one image, contrasting two representational schemas. I will discuss how Clermont helps us encounter plants more positively by exploring how Clermont injects high degrees of audiovisual ambivalence into standard plant imagery.

A key moment comes at Clermont's video's beginning, setting the stage for how we might view the entire artwork. The video starts with a zoom that retreats from a television. After a beat, the camera retraces its movements until the profilmic television screen's edge envelopes the frame. This viewing position is maintained throughout, suggesting that the video's material is emanating from the diegetic television. Consequently, one is twice removed from the video's content, watching a plant being watched. A plant's actuality, whatever that may be, is, generally speaking, veiled by some conceptual scheme that has been unjustly imposed. This viewing position speaks to the idea that plants in the west are, and have been for millennia, perpetually screened.

By 'perpetually screened', I am addressing how traditional beliefs concerning plants' identity, as expressed by Aristotle and Bichat, for example, not only *over-look* but *over-code* plants' liveliness, manipulating plant being to articulate anthropic supremacy. Though plant imagery is ubiquitous, midway through the video one sees five separate images of plants that are static and two dimensional. These depictions show sections of plant bodies, segmented for analysis. The frame includes an internal border, as if we are looking at a photograph. The images' backgrounds are neutral, non-descript. Plant bodies stand alone, severed from native milieus. These images parallel herbarium imagery. Historically, herbaria were botany's primary literary document, blending plant imagery with descriptive text in booklets cataloguing plant types, uses, and behaviours. Now, herbaria can also be museums. Either way, herbaria hoard plant specimens that are systematically presented to facilitate endless analysis. They identify plants, hedging them into rigid taxonomies and neat systems of classification which legitimate and imply the presence of a central subject that adjudicates on such arbitrary groupings and polices their borders. Herbarium pay homage to anthropocentric imaginaries. This observation links back to Butler's theory, as herbaria are mechanisms for capturing, incarcerating, and identifying plants.

Botany has an antecedent in the prehistoric practice of herbalism, the cataloguing of plants for medicinal, sacral, or general use. Moreover, Indigenous cultures in, for example, north America, have been scientifically accumulating botanical knowledge for millennia, often acquired directly from plants. Aloi suggests that, in the west, botanical science emerged with Aristotle in the 4th century BCE, yet it was during the 16th century that botany began to garner gravitas, mainly through two releases, Otto Brunfel's (1488-1534) *Herbarum Vivae Eicones* (1532-1536) and Fuchs' *De Historia Stirpium*, alongside Luca Ghini's (1490-1556) institutionalisation of the academic study of plants and, more broadly, nature in Bologna and Pisa during the 1530s (Aloi 2019: 14-15). The only ways for botanists to study plants from beyond their locality is to travel, have plants sent to them, or examine representations. Initially, herbaria solved these conundrums, via literary plant catalogues including visual illustrations. Aloi explains how plants regularly “appeared morphologically flattened—their parts were clearly manipulated to best fit the flatness and borders of the page upon which they were drawn. The background was neutral [...] while the vast majority or totality of the leaves and flowers appeared parallel to the page” (Aloi 2019: 14).

Placing plants in a decontextualised space composed of neutral backgrounds effected metaphorical deracinations, visually severing plants from *Umwelten* in Uexküll's sense, to offer them up completely to analysis (Aloi 2019: 13). Rather strangely, in early herbaria, verisimilitude was somewhat unimportant. More importantly, plants were posed to facilitate straightforward observation. As botany flourished, higher visual precision was required. Aloi explains how Ghini began introducing specimen collections as aspects of his programmes (2019: 15). Accumulated specimens were introduced into herbaria, replacing illustrations lacking in fidelity. Dried specimens typified further, literal deracinations, shifting the stakes in each depiction because every image was no longer a drawing but a deracinated plant that had been murdered, transforming the literary, museological herbarium into a papery

mausoleum of pressed and mounted vegetal matter. Again, we encounter the conundrum concerning plants' in/animation and life/lessness. Representing dead and murdered plants in documents designed to summarise and communicate vegetal lifeways, such literary herbaria communicated plant identity as a deathliness. Plants were killed then preserved so their bodies retained former vigour, remaining colourful and rigid. Subjected to vegetal taxidermy, plants persisted in twilight states of pseudo-death, separated from their organic cycles of withering and regeneration. As Aloi writes, "Leaves and flowers were made to adhere to the surface of the page, while stems were organized to impose a sense of clarity and definition to the plant-body; the overlap of leaves and stems was avoided whenever possible" (2019: 15-16). Nevertheless, dried specimens did not precipitate higher verisimilitude. Paradoxically, pressed specimens represented referents to lesser degrees than illustrated counterparts. Aloi explains how the process of drying specific plants altered their morphology to such an extent that they bore little resemblance to their living counterpart. Not only flattened, the leaves' and flowers' texture and colour were uncannily altered. However, this modality of representation remained desirable precisely because it offered the strategies, however flawed, to initiate a taxonomy of plant life based on empirical science (2019: 16). Not only were plants actually deracinated, but their representation also deviated from their living image. Within such modern herbaria these two deracinations, one material and one conceptual, began to coincide.

Clermont's video generally comprises plant imagery abiding by standard registers, including lateral pans, static frames, and zooms. Viewpoints frequently hover at anthropic head height, scanning horizontally, regarding plants from above, framing plants as lowly. A majority of these images were captured at the botanical garden in Montreal, introducing another layer upon which Clermont plays with herbaria imagery. Aloi explains how, during the Renaissance, royalty and the upper classes extracted plants from their indigenous homelands before hoarding them as symbols of colonial power (2019: 13). Modern botanical

gardens descend from imperialist legacies and fascinations that also begat contemporary zoos, entangled with European projects of colonial extraction and hoarding symbolic valuables. Like zoos, museological herbaria are carceral institutions, capturing, transporting, and holding plants in manufactured environments designed to replicate their preferred habitats. Early photographs were wrapped up in this project, too. Atkins's *Cyanotypes* book was firstly an herbarium, and latterly a photographic artwork. Literary herbaria (i.e., a book containing depictions of plant) are also carceral, as their reliance on deracination, transplantation and pressing dried specimens shows. In 'Why Look at Animals?' Berger writes that "public zoos were an endorsement of modern colonial power. The capturing of the animals was a symbolic representation of the conquest of all distant and exotic lands" (21). Likewise, Aloï contends that "developing knowledge of the natural world became a valuable way to demonstrate one's mastery over the world" (2019: 13). In botanical gardens, plants supply emblems of power. Hoarding and documenting plants signifies one's mastery over their native territories, not only over the plants themselves but their indigenous habitats and, consequently, the human and more-than-human animals who live there, too.

When interpreting Clermont's investigation into the relationship between plants and herbaria, her title, from May Sarton's (1912-1995) eponymous book (1968), supplies a cipher. Sarton explores the loneliness but also freedom of living alone, and becoming habituated to new places, which Sarton achieves by modifying her house's internal character and labouring in the garden. In an interview, Clermont explains that

I remember that I took the title 'Plant Dreaming Deep' from May Sarton's book. I don't remember it all, but she's describing her loneliness... I felt trapped at that time and found the title wonderful. As if things were still and floating. The part where the

flowers are glitched, saturated in purple and pink, at the beginning... It felt like the inside of my body: lonely and suffocating (2022).

Clermont connects loneliness, suffocation, and plants. More specifically, plants constrained by herbaria. Clermont seems to say: plants exceed herbaria, which deracinate, suffocate, render lonely. However, Clermont formally rejects the herbarium's impulse. Although we see plants, each image is nearly indiscernible. The image comprises a distinct lack of focus. Pixels incessantly blur. Clermont utilises a video synthesizer, manipulating the original video. The images include an undulating, wave like quality. Bands of static regularly cascade downwards, horizontally bisecting the screen, generating mobility despite the images' immobility. Hues of every palette overload the images, suffused by myriad, shifting colours, from neon purple to soft cyan. It as if the herbarium's form, usually a stable container, is now unable to fully contain its content. We see too much, as if two contrasting perspectives of plants are vying for supremacy within the screen's parameters. Clermont's methodology disrupts botany's capacity to determine, suggesting that plants may exceed the systems purportedly accounting for them in their entirety. A standard description of plants comprise inertia, non-consciousness. Could Clermont's vibrant aesthetic be signifying plant ontology's excess? The profound vitality behind the supposed inertia? An ear to Emilie Payeur's soundtrack say yes. Conjoining organicity and artificiality, it is incessantly rambunctious, sonically embodying plant vibrancy. Never achieving tidy musicality but continuously becoming-musical, it audibly writes plant life as an excessive force.

Concerning interstitiality, analogue video's specificity is illuminating. Squished between analogue film's arcane beauty and the digital's clarity, analogue video's specificity comprises deficiency, liminality—like a plant confusingly conceived as neither completely

dead nor wholly alive. Video's deficiency opens onto creativity, for Clermont, who argues that

I would not see the point [in] film[ing] with a digital camera because the images that I w[ould] record would be very close to a *tangible reality*. My favourite world is dream... illusions. Clouds. Colours. I still do that, take a walk and imagine the trees having blue trunks and purple leaves, pink sky, orange lawn [...] By altering the images, I create a distance. A distance from the original image. Which makes the images less accessible and brings it more to the side, the world of unconsciousness (2022; emphasis added).

By 'tangible reality', I believe Clermont means an anthropic reality. Consequently, embracing analogue video's deficient clarity whilst altering the image, Clermont introduces a distance from the original, a window onto a space where formerly familiar things might adopt new guises.

Additionally, a key aspect of analogue video's specificity is its connection to aesthetic and economic poverty. In Hito Steyerl's article 'In Defense of the Poor Image' (2009), Steyerl proposed a manifesto concerning images and image-making technologies rendered obsolete, made to circulate in increasingly nebulous contexts by the onwards march of cinematic progress, potently manifest in digital imagery's increased fidelity and capacities for widespread exhibition. In the 80s or 90s, Steyerl explains, the widespread, neoliberal restructuring of how media was produced and disseminated contributed to experimental media's accelerated obscurity. As experimental film or video became increasingly difficult to circulate along mainstream channels, it was also deemed too obscure, challenging, or simply

unprofitable for television. These works began to fade out of perception altogether. As mainstream cinemas became increasingly luxurious and complex, independent filmmaking was, in Steyerl's perspective, actively marginalised, pushed back into an avant-garde remnant of metropolitan culture clubs, or simply condemned to the darkness of the archive. For Steyerl, the index of an artwork's poverty is its disappearance from mainstream perception and re-emergence in alternate viewing contexts, where lower resolutions stemming from recurrent compressions speak to enforced nomadisms and imposed exiles from economies of cultural and monetary value. Unloved by the mainstream, analogue video scans as defunct refuse. Clermont says that "my first works, the one you are mentioning, were all done with VHS and other funky tape cameras because I had a poor financial situation. It was less expensive than film" (2022). Perceived to be liminal, deficient, poor, discarded: analogue video's specificity may itself coincide with perspectives of plants. Not only 'perceived' to be poor, analogue video was often employed by less solvent artists, as expressed by Clermont. However, analogue video's specificity allows Clermont to incorporate contingency and chance, by using a video synthesiser, which modifies the video's form in never entirely predictable ways. Clermont contends that "I love experimentation and I love letting the materials express themselves. They're free. I like to think that they are living on their own, too" (Ibid.).

Clermont coincides with biosemiotic frameworks by attending to alternate semiotic repertoires. Interspersed throughout the video are images of gesticulating human animal body parts and written words. "I film plants but also human body parts", Clermont explains. "My work won't make any sense if at least one of these are not present, the work will feel empty or fall apart" (2022). When words appear, letters are redacted, and the brief time of words' presentation blocks their full comprehension, inscribing a failure of western, anthropic language to adequately signify. Arguably, bodily gesture delineates a non-species-specific

and pre-linguistic system of biosemiotic communication, ubiquitously democratic. In ‘Notes on Gesture’ (1996), Agamben speaks of gesture as the “communication of a communicability. It has precisely nothing to say because what it shows is the being-in-language of human beings as pure mediality” (58). Gesture might communicate communicability, but unlike Agamben, I do not take gesture as a ‘lower’ form of communication, nor something without anything to say beyond the act of saying itself. Conversely, gesture is a language form equally efficient to verbal communication. In Clermont’s video, language, supposedly human animals’ special tool, is discredited. Plants, using iconic, gestural bodies, may conduct semiosis and showcase their possession of life. The gestural body becomes a shared semiotic arena, a locus of multispecies communication and understanding. We communicate with plants through observation and gesture, specifically touch. Carefully picking portions of, or uprooting entire plants, we communicate our desires. Plants reply by flourishing or withdrawing. We might move domestic plants to different locations throughout the year, depending on environmental factors (e.g., light). Plants might articulate their gratitude by re-orienting their leaves, maximising light reception or water ingestion. These communications rely on physical gestures, shared understanding, and empirical observation—on looking, learning, and action. We constantly engage in gestural communication with our multispecies companions.

Clermont effects a rigorous management of cinema technology. Consequently, is Clermont’s methodology merely a skewed version of Reichmann’s or Lumière’s? Absolutely not. If one removed the artefacts of Clermont’s experimentation—dense colourisation, disturbance, and so forth—we would uncover some normative imagery wherein plants have been captured through static, slowly panning, or gradually zooming shots: according to visual conventions approximating those within literary or museological herbaria. However, Clermont overwhelms such imagery. Clermont problematises these representational systems,

neither redeploing nor negating them, productively constructing alternate views by experimentally re-viewing imagery indicative of a different style. Yet Clermont is not viewing plants in an entirely strict sense. Rather, Clermont primarily re-views, and subsequently destabilises, the systems by which plants are generally imaged and imagined—namely botany, but also its progeny: the so-called nature or wildlife documentary. I approach Clermont's video as a nexus where two agendas clash, fail to perfectly coincide, and consequently produce a rich ambivalence. And perhaps it is upon the terrain of this ambivalence that a new view of plants may propagate.



On previous page: Fig. 4, 5. Doing producing phytograms.
Images courtesy the artist.

In image 1, we see sections of plants placed on strips of film laid in plastic guttering. Immanent animation is underway. In image 2, Doing is placing these gutters in the sun, stimulating the phytographic process. Both images were taken in Doing's garden, where he has designed and built a phytography studio in his shed, pictured, in the second image's left section, obscured by white flowers.

This process, entirely subordinated to plants' organic schedules, even tailored to plants' instructions of restraint, reciprocity, and gratitude, invites analysis of a film practice synchronised with planthood. What might this be?

TO FILM LIKE A PLANT

Plants are generally regarded as supremely destitute, legitimating their maltreatment.

Debating with Marder, animal ethicist Gary Francione challenged plants' rights to ethical concern, claiming that we have no evidence of plants' capacities to suffer or experience intentionality (2012a). Francione consequently rejects human animals' moral obligations to plants, whilst rejecting the idea that plants possess interests or goals (2012b). Aloï contends that Francione's position recalls the application of René Descartes logic, yet Francione swaps animals for plants, who appear to be an automatic form of life, devoid of desire, reason, or objective (2019: 6). Responding to Francione, Marder points out how contemporary botany provides us with abundant evidence in favour of plant sentience, for example, in regards to the ways in which plants' roots can alter their patterns of growth in response to the nutrient profiles of nearby soilscares (2012b).

Francione investigates plants' poverty. Marder examines plants' wealth. I used the expression *Altissima Paupertas* (highest poverty) for the second subchapter's heading, borrowing from Agamben's *The Highest Poverty* (2013), an analysis of the Franciscan order. I am using this concept differently. I further play with this in this chapter's third subheading, *Altissima Divitiae* (highest wealth). The interplay between these expressions seemingly describes plants' condition. Where plants are considered destitute, plants truly enjoy superabundant worlds that should be called rich.

My goals have been: to exemplify how plants were theoretically impoverished; to challenge this through philosophy, and plant ethics and science; to explore how plants are regularly depicted in cinema; and to investigate a turn in contemporary experimental cinema to plants. Plant-filming builds on Michael Marder's term "plant-thinking" (2013b: 124), which considers "how human thinking is, to some extent, de-humanized and rendered plant-like, altered by its encounter with the vegetal world" (Ibid.). Plant-filming expresses how representing plants requires new representational schemas, new methodologies, and new ways of understanding cinema industrially. Plant-filming is not a lofty concept, merely a tendency. Media respectfully coinciding with plants, materially or thematically, conduct plant-filming. Consequently plant-filming may occur accidentally. Cinema's becoming-plant, however, is conscious. Neither Doing's nor Clermont's artworks exemplify its full materialisation. Yet they have provided new views of plants by devising regimes through which plants can be welcomed or appropriately imaged. Thus they are instances of plant-filming and movements towards cinema's becoming-plant.

Marder contends that veganism is not perfect, yet may be "perfectible" (2012a). For Marder, veganism is not inherently ethical because plants enjoy beyond anthropic designs. To this conundrum Marder offers the expression "to eat like plants" (Marder 2013a: 33). This is a culinary and an epistemological objective. Eating like a plant restricts anthropic tendencies to devour others' corporeal bodies, and ontology (2013b: 185). Consequently, Marder seeds inquiry into filmmaking process rooted in plants' lessons. However, I abandon perfection because perfection, implying beatific terminus, is an unhelpful fallacy. Thinking through and embracing cinema's imperfectability is more productive. Furthermore, we should mention that plants do not move towards terminal perfections, rather exhibiting ontological circularity by growing, withering, and regenerating cyclically. Perfection clashes with vegetal, perhaps earthly, schemes. Cinema is nowhere near perfect, nor can it ever be. As I explore in my

conclusion, I propose that a ‘perfect’ cinema, for which I nominate the expression ‘non-violent’, remains an ideal to be groped towards even whilst it forever evades achievement. Nevertheless, I contend that it is necessary for non-violence to be sought, despite human animals’ and cinema’s constituent inability to operate non-violently per our heterotrophic inadequacies, manifest in a shared inability to not eat. Cinematic justifiability might emerge along this provisionally endless journey. Luckily, the earth overflows with guides that have learned to live in ways enabling others’ flourishing even whilst extracting what they require.

I conclude this chapter by investigating whether we might film like a plant. Filming like a plant means cinematically following plants towards non-violence. This begins with learning from Indigenous instructors how to address plants as teachers, then empirically exploring plants’ subjectivity before respectfully translating plants’ behaviours and biological processes into cinematic registers, even tailoring film production to plants’ styles of expression. Filming like a plant requires respecting specificity, realising nothing reaches its fulfilment in some imposed end. It is a restriction on unbridled consumption, for plants only enjoy what is close at hand, never eating without remainder, always sharing—never hoarding—what they eat. Filming like a plant entails returning cinema to its roots in two senses: understanding cinema as an industry whilst forcing it to scale down, partaking from the earth only respectfully, slowly, in small batches. *Reracinate cinema!* plants seemingly say; *Return cinema to its roots!* By roots I mean cinema’s constituent materiality, whether analogue or digital. I am not talking about nostalgia. Rather, I am talking about analysing cinema’s possibilities right here and now through precise analyses of its environmental footprint and toxic materiality. By acknowledging cinema’s physicality, we bind cinema to the world, possibly uncovering ways via which more-than-human beings can express themselves. Phytography provides one example.

Sasha Litvintseva contends that cinema is intimately connected to colonialism and an extractive frontier that shows no sign of stopping. As Litvintseva points out, smart phones hold within themselves minerals and elements harvested from across the world, containing rare earths extracted from Inner Mongolia, or lithium mined in Chile. We could add to this ingredient list a litany of additions, like coltan from the Democratic Republic of Congo. Thus, as Litvintseva proposes, every film frame, even if representing no material in a traditional cinematic sense, can tell a complex story concerning industrial capitalism's history (2018: 111). Cinema regularly exploits the earth, yet sequesters its earthly nature. Transforming cinema into an institution capable of remediating eviscerated landscapes necessitates unprecedented reorientations, decoupling from industries that take irresponsibly. We can think such industrial commitments through cinema's reracination. Cinema's reracination describes the return of cinema to its roots as a material industry, and a wholesale rejection of the cinematic image's tendency to transcend the context of its production. Etymologically, deracinate stems from the Latin word for root, *radix*. Deracinate means to pull up by the roots, or de-root. Reracination, then, is a word that describes a restorative trajectory, to re-root. However, cinema's reracination is not exclusively industrial. As Doing shows, falling back to cinema's body exposes ways of producing imagery with—not of—the world. New views emerge from the tangle of cinema's material roots. Various dimensions get synthesised through the methodological prism of cinema's reracination.

Cinema's reracination names, at least, a fourfold operation. (1) We must scale cinema back and down. Cinema must be made to partake only respectfully, slowly, in small batches, and absolutely never without remainder. Filmmakers must never exceed their grasp, exclusively operating in hyper-local, grass-roots contexts, like plants. (2) Filmmakers should connect networks of beings relating with each other across an earthly matrix, whilst exploring cinema's place in that network. These parameters are not merely negative restrictions. Pairing

back is a gateway to multispecies creativity. Cinema's material body enables more-than-human communication and multispecies co-creation. (3) Cinema must build rhizomes with its partners. Total consumption is not a requisite of cinematic exertion. Cinema should facilitate the expression of the subject of its analysis, even when that subject is more-than-human. Cinema must strive towards multispecies plateaus which strengthen every party. (4) Cinema must be investigated as an industry firmly rooted along every axis, fundamentally reliant on the earth. Responsibility requires accountability. Without accountability, as Donna Haraway says, "response-ability" (2015: 28) is vacant. If cinema may serve the climate crisis's resolution, it must accept its role within that crisis's formation. Evading recognition, cinema freely walks a deadly path. "[C]inema has to land", says Doing in an interview. "Flying ever upwards is unrealistic and unsustainable" (2022). This paragraph is as a manifesto written in conjunction with anthropic and bacterial, fungal, and vegetal inputs. Filmmakers must explore the earthly ground that subtends their practice and trace new pathways of peace from points of material origin.

A crucial element of filming like a plant requires producing and acting responsibly, being mindful. This sets down a juncture to shine a light on violence, to root it out, mull it over, and measure one's analyses against it. It would be incredible, even impossible, for a cinematic production to be free of violence, no matter what that production advocates through its content. It is never a question of presence or absence, rather more or less. Employing contemporary digital technologies, Clermont's videos are intimately related to: extractive industries; modern slavery; global transport infrastructures; environmentally deadly pollutants; habitat destruction; and exploitative labour conditions. Doing's film includes an emulsion containing gelatin. Additionally, bringing plants into contact with analogue film requires transplantation. Doing, however, respectfully manages such negativity, accepting responsibility. In an interview, Doing says that

I agree that it is important to look at the environmental, economic and social entanglements of the tools and materials that are being used to produce artworks. In my own practice this includes film-stock, chemistry and all the tools to process, edit and distribute my work. [I have] strive[d] for an economy of sufficiency, whilst seeking relationships based on kindness. [This film] was made on [...] 16mm film that was given to me by a film archivist. The rusty can with faded GDR label looked like trash and would certainly have been thrown away ending up in a landfill without my friend's generous gesture. [...] I rarely uproot whole plants and instead look closely at the plant before picking leaves or flowers, carefully taking only the parts that I will use. Moreover, I also have a preference for plants that are growing in abundance, mostly these are weeds, unwanted and unloved by gardeners (2022).

In 'Phytograms', Doing also explains how he only extracts plants from healthy gardens or landscapes, whilst also uprooting plant parts, not entire plants. In this way, plants' flourishing can be maintained, and by selectively extracting only abundant plants, entire landscapes can be benefited (2020: 34). But Doing is not innocent. However, he acknowledges accountability, operating as a beginner, trying to find a way forward. The forging of more peaceful practices that refuse to destroy through the acceptance of ecological responsibility is a particularly important aspect of filming like a plant.

The cost of transfer also weighs on Doing's film. Available online, *The Mulch Spider's Dream* depends on a killing industry. Data is never disembodied. All clouds have actual wellsprings. Could Doing achieve recognition without going digital? Are digital transfers and online accounts contemporaneously necessary? Answers or solutions are not

immediately apparent. But such conundrums offer fertile ground for advancement. Doing regards himself as a fallible beginner whose onwards momentum results from transformative encounters with human and more-than-human others. Doing embodies filming like a plant's restless movement towards increased sustainability. Like a splaying rhizome or inquisitive shoot, filming like a plant names a relationship to cinema wallowing in imperfectability. Filming like a plant is about testing out new allegiances in an ever widening field of connections.

Furthermore, we must find alternate ways of disseminating media, too. Doing's methodology provides us with options. How? Doing exhibits in smaller, often community run venues, predominantly projecting himself. With only two copies in circulation, largescale exhibition events are impossible. Made in a back garden, exhibited in venues one at a time, Doing's methodology shows how cinema can avoid leaving too many marks. However, my argument is vulnerable to ripostes. For example, that such rarefied behaviours lack real-world application, that they are out of sync with reality. A rejoinder like this presupposes that cinema, in its contemporary, dominant state, complements our world's actual rhythms, that any operation to the contrary is crazy. But cinema is fundamentally broken. It designs its own suicide whilst advancing the earth's destruction. Consequently, such responses are short-sighted. Cinema's full-scale metamorphosis is massively difficult, but necessary. Designing sustainable ways of doing this must become a next step.

Alternatively, that working marginally is sufficient, that a more aggressive stance is required. However, as Doing says, "there is great power in withdrawal, the game can't continue when there are no players" (2022). Perhaps cinematically pursuing peace with plants requires, very simply, the employment of peaceful practices. Resistance needn't be laced with explosive bravado or spiced with vitriolic machismo. Rebellion, too, can take its cue from plants. Take Marder's instruction: "Resist like a plant!" (2012b: 31). Consequently, filming

like a plant may expose a trajectory of cinema wherein every act of making manifests as an act of rebellion which is peaceful, top to bottom. Unplugging is an activity requiring enormous effort, and which exposes a matrix of reverberations. A positive no, an active decision to not. Pursuing viable alternatives, living and creating with passion and yet non-violently, is a way forward. There is a plant's way, and the plant's way is revolutionary.

The earth is beset by crisis. Destruction's exigency offers a juncture wherein stale ideas may be blasted open and reappraised. Western views of plants are changing. Every plant is a who, not a what. However many solutions revolve around an intensely heightened instrumentality. This replicates a historic abuse under a new, anaesthetised sign.

Acknowledging plants' artistic and pedagogical capacities, *Clermont* and *Doing* explore alternate trajectories. To retain a radical potentiality one must critically rethink ideas and beings that were once so recognisable. New, wholly experimental modalities are required. Works radiating out of contemporary experimental cinema may provide such modalities.

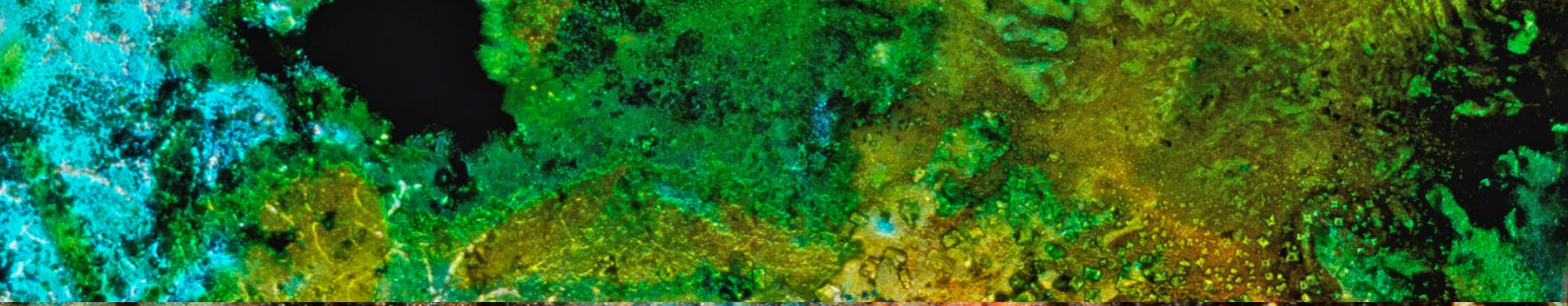
Plants exemplify a style of existence that can be drawn on to produce a cinematic methodology amenable to the peaceful production of artworks capable of promoting multispecies peace, the framework for earthbound futurity. Filming like a plant excavates an alternate cinematic trajectory along whose winding, maybe endless tracks less violent forms of theory and practice might appear. Today, the contemporary cinema industry and its media outputs function as one of the many engines of a deleterious machine which shows no sign of tiring. But routes of resistance exist. Cinema, perhaps paradoxically, is one. Following plants is another. Through their unity—a medium of peace with the earth.

Human animals' and cinema's collective futurity requires plants' flourishing; assenting to plants becomes both humans' and cinema's collective challenge. Learning "to say 'yes' to plants" (Marder 2013a: 36) is one of human animals' and, by extension, cinema's

most necessary tasks. Its difficulty coincides with its necessity. The earth's continuation depends on not abusing plants. Cinema is no exception to this rule.

Plants have assumed my full focus. The logics guiding my argument are applicable elsewhere. My readings may not be. One-size-fits-all approaches are inappropriate. The level of inventiveness and innovation now necessary is staggering, maybe unattainable. This may work as an antidote to the idea that every desire may be satisfied by flicking a switch. Extreme degrees of intellectual and practical labor; forging new, seemingly unthinkable connections; descending from a lofty perch; working hard to slow down—these are the tasks towards which the contemporary Western person must turn. Success, of course, may be impossible. Thankfully, the pursuit of peace is always a worthwhile enterprise in and of itself.

This long journey can begin with assenting to plants. When filmmakers say yes to plants, they engage in plant-filming, an umbrella over-shadowing additional concepts. At the end of the world, we might follow the plants, who guide us in not only living, but producing cinematic art.



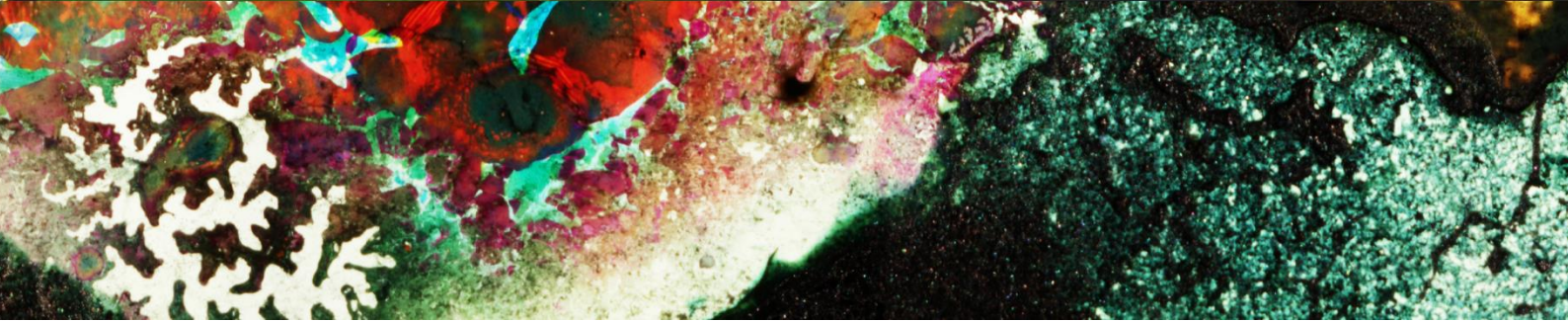
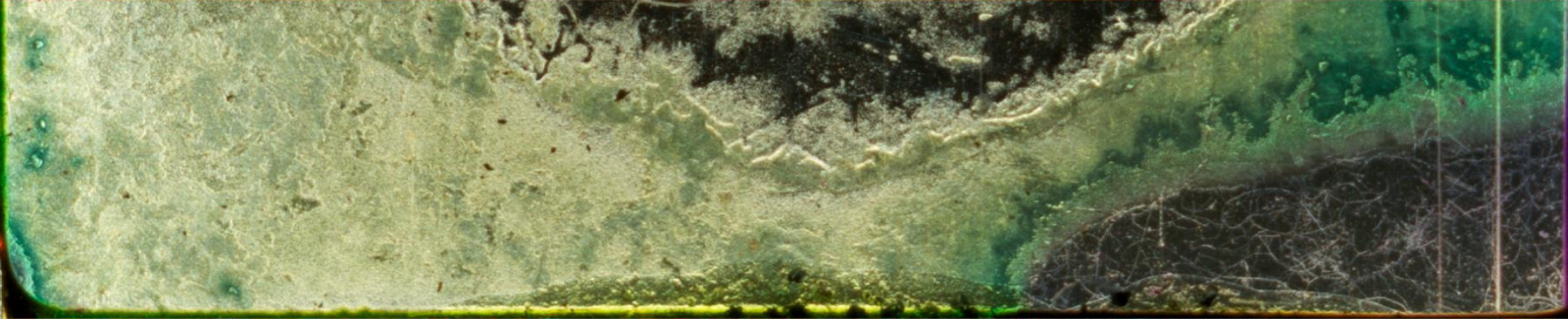
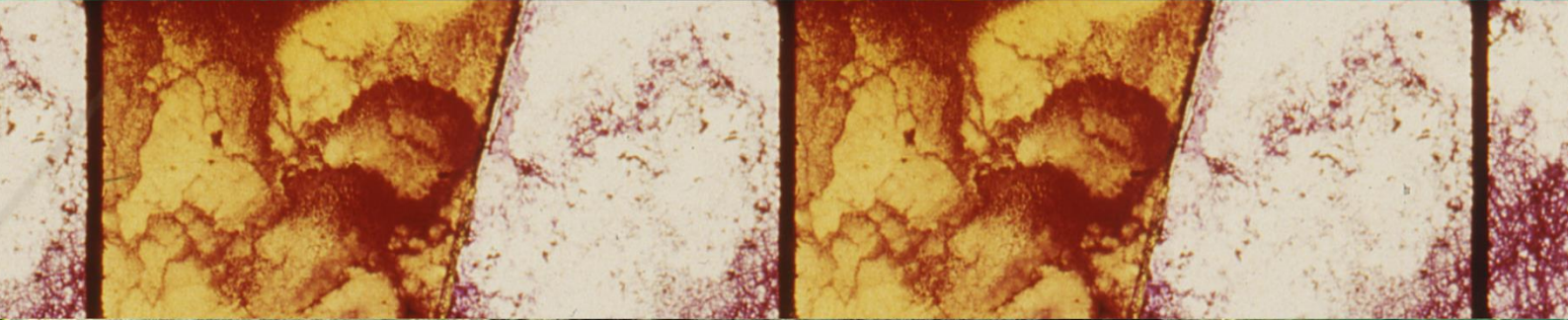
STRIP MINING:



BACTERIA



ON FILM



§ 4

Or the apparent order can be reversed,

*with cultural or technical phenomena providing a fertile soil, a good soup, for the
development of insects, bacteria, germs, or even particles.*

The industrial age defined as the age of insects...

(Gilles Deleuze and Félix Guattari 1981: 69)

Following plants, we encounter bacteria, who share with plants entangled histories, presents, and futures. As mentioned in chapter 3, 2.4-2.0 billion years ago, cyanobacteria, commonly known as blue-green algae, began producing oxygen. Plants' chloroplasts reference ancient endosymbioses, when a free-living cyanobacterium was engulfed by another organism. Cyanobacteria still photosynthesise, a nutritional pathway neither originating with nor exclusively practiced by plants. Michael Marder contends that human and more-than-human animals share with plants the capacity to extract nutrients from food. Furthermore, Marder proposes that plants perfected this process long before our evolutionary emergence, and so, in some sense, "we eat *thanks* to plants" (2013a: 32; emphasis in original). Again we encounter Marder's 'phyto-centrism', for plants eat and live thanks to bacteria. Homing in on plants brings us further away from their lessons. Feeding on plants and primarily breathing plant-fixed oxygen, we do, too. Animal digestion largely requires bacterial assistance, not least when digesting plants. Within us resides an "uncanny plant" (ibid.) *and* an uncanny bacterium, whose mutual residency in animal and plant bodies illuminates another point of connection between bacterial, creaturely, and vegetal being. Like plants, bacteria's history also comprises misrecognition and maltreatment, instrumentality and appropriation. At first, bacteria were addressed as tiny animals. However, simultaneously, they were approached as plants. Bacteria were actually split into two groups on account of divergent metabolic processes. One, plantlike, photosynthesised. One, animalesque, engulfed others. We retain a residue from this period. The bacteria thriving in our guts are regularly called microflora, tiny plants. A further interpenetration of bacterial and vegetal life concerns shared entanglements with visual technology. Cinema has been consistently deployed to study vegetal movement. Furthermore, it is only through visual technology that we may see individual bacteria, for bacteria live below our vision's threshold. However, bacteria become collectively perceptible when gathering en masse. Consequently, one way bacteria appear to us without technological

intervention is via biofilms: pond scum, dental plaque, so forth. Now, I suggest that biofilms facilitate engagement with bacterial life without intervening media, revealing a category of artefact and modality of cinematic production operative in human animals' absence. Made by bacteria moving in time, biofilms, in name and dimensions of production, beg us to investigate non-anthropogenic and non-anthropocentric forms of cinematic art. What happens to us and cinema when we think biofilms in conjunction with cinema, and furthermore, when we approach biofilms' creators as audiovisual artists and biofilms themselves as visual media; or, works of cinematic art?

I propose a synthesis of bacteriology and cinema decoupled from microcinematography (the production of moving images with microscopic technologies). I begin this inquiry by time-travelling to visit Paris's Académie des Sciences in France on October 26, 1909, when an event related to what Oliver Gaycken calls the "second major flourishing of popular science film" took place (2011: 374), initiated by Jean Comandon (1877-1970), a microbiologist specialising in syphilis research. The exhibited films were visual aids to Comandon's doctoral thesis, a study of the spirochete bacterium *Treponema pallidum pallidum*, known today to cause not only syphilis but Lyme disease, leptospirosis, and yaws. Syphilis bacteria were discovered by Fritz Schaudinn (1871-1906) and Erich Hoffman (1868-1959) in 1905, however discovery failed to remedy diagnostic issues since syphilis can present in many symptoms or zero. Comandon realised that syphilis spirochetes exhibit idiosyncratic movement, which became the key factor of analysis. Comandon noticed that the young medium of cinema could possibly unlock this inquiry, employing quantitative analyses of spirochetes' motion to execute accurate and early diagnoses. Even then, microscopy could not facilitate scientific or public sharing, for transported media bore only dead bacteria, static and inert. Fortunately, microcinematography, by contrast, condenses time into digestible packets of audiovisual information on shareable media, facilitating

visualisation and the mass viewership of bacterial momentum. As Hannah Landecker contends in 'Cellular Features' (2005), Comandon hoped to diagnose syphilis by identifying and monitoring syphilis spirochetes' idiosyncratic movements, and to monitor momentum and movement, Comandon utilised cinema (909).

Comandon's *Spirochaeta Pallida (Agent de la Syphilis)* (1909) was critical vis-à-vis the standardisation and popularisation of microcinematographic analyses of cellular dynamics, due mainly to Comandon's work's technological supremacy and extended outreach achieved through partnership with Pathé, then the eminent European film company. *Spirochaeta* typifies the instance where a prominent modality of imaging, and imagining, bacterial life gained significant traction. *Spirochaeta* displays some bacteria slithering across a sunless void. Their quivering, helical bodies appearing as tears of white against a background of pitch, fiery comets trawling through a cosmic sea. *Spirochaeta*'s reception was heavily impacted by its use of ultramicroscopy, developed in 1902 by Richard Zsigmondy (1865-1929) and Henry Siedentopf (1872-1940). What is ultramicroscopy, in contrast to microscopy? Ultramicroscopy lights items placed in a dark enclosure from the side, producing an "almost magical image", as Comandon says (qtd. in Gaycken 2011: 375), of some luminous elements against a black field, reminiscent of "'a starry sky'" (Comandon qtd. in Gaycken 374), allowing viewers to observe particles whose dimensions are smaller than the wavelength of light (Gaycken 2015: 96). In this regard, *Spiroacheata* was doubly unprecedented, visually magical and revealing previously unfathomable motion, evincing wonderment, although visual technology, not bacteria, received primary emphasis. Landecker explains that viewers were enamoured with the microbes' momentum, produced by the film's projection. The appearance of such traditionally elusive or even unknown phenomena shocked viewers, as they burst on to the screen in a flurry of grainy light. "Not just the sight but the very possibility of the sight of such incredible activity and energy of motion of

bacteria [...] was, even for the scientific observer used to the microscope and its sights, something of a shock” (911). Gaycken tells us that reviews from the time deployed a bombastic, triumphant tone, construing filming as a raid into alien territories (2015: 94). As is often the case in the scientific employment of visual media the films’ spectacular aspects were as prominent as the analytical framework and the element or being under analysis. This tendency was most obvious in the attention the presentation received in the contemporary press: *Le Matin*, *Je sais tout*, and *Lectures pour tous* all covered the presentation; *Le Matin*’s headline proclaimed ‘Man Has Succeeded in Cinematographing the Invisible!’. Given such responses, *Spirochaeta* and its reception beg various questions: might cinema, even if deployed scientifically, withhold mastery, showcasing neither its own potency nor its inventors’, but its subject of analysis’s agency? Could cinema, instead of mastering bacteria through visual capture, intensify bacterial recalcitrance? Can cinema think about, and learn from, bacteria differently?

What is wrong with microcinematography? Do not micro- and close-up cinematography produce similar imagery? Generally, yes. Aren’t close-ups regularly celebrated as engendering non-anthropocentric revelations? Yes, close-ups enjoy a pedigree in film scholarship. “The close-up is the soul of the cinema” (2010: 85), writes Jean Epstein, whilst also writing elsewhere that “The almost godlike importance assumed in close-ups by parts of the human body, or by the most lifeless elements in nature, has often been noted” (2012/1926: 294). Siegfried Kracauer argues that, carving up the world into sections (1957: 97), redistributing significance and even “bring[ing] the inanimate to the fore” (45), close-ups destabilised human animals’ dominance, disturbing anthropic actors’ status as the narrative’s focal point (Ibid.). Kracauer continues, proposing that close-up imagery expands our perception in a double sense, not only enlarging what we see but how we think about the world around us (48). More recently, Vicky Smith, in ‘Experimental Time-Lapse Animation

and the Manifestation of Change and Agency in Objects' (2018), echoes Kracauer, arguing that close-up imagery, time-lapse cinematography, and other experimental or non-traditional cinematic techniques can reveal a world beyond our naked eye, manifesting an engagement with portions of our immediate environments that exist beyond everyday perception (98-99). As proposed in chapter 3, I argue that close-up cinematography, when employed to address more-than-human life, is also problematic, precisely because, by refusing to deviate from anthropic styles of perception, it reiterates human animals' supremacy. Nevertheless, neither microscopy nor microcinematography are technically comparable to close-up cinematography. Close-up cinematography requires applying a type of lens to a camera, and zooming in on a target of analysis. Conversely, microscopy and microcinematography require a different battery of technologies and machines. These mechanical differences and specificities signal and precipitate entirely different ways of approaching and handling living beings and materials, and consequently, evidence different ways of approaching the world. However, Lisa Cartwright, in *Screening the Body* (1995), which investigates the relationship between ideas concerning life and visual culture, explains how microscopy's intervention in, and extension of, human animals' capacities to see precipitates not an increased proximity to the world, but a radical severance from it.

Microscopy closes one eye to its object, offering up a modernist text that is stripped of historical as much as spatial depth. [...] Placing a specimen on the instrument's stage and closing one eye to peer through the viewfinder, the microscopist sees the body in a manner that effectively distances the observer from the subjective experience of the body imaged. Excised [...], stained, blown up, resolved, pierced by a penetrating light, and perceived by a single squinting eye, the microscopic specimen is apparently stripped of its corporeality, its function, and its history (83).

In contrast to close-up cinematography, microscopy and microcinematography abide by shared methodologies and ideologies, idiosyncratically problematic. Neither microscopy nor microcinematography mystifies or elevates. As Cartwright argues, microscopy, as a technical device and cultural tool, is one of many instruments of institutional surveillance and power (83). Microcinematography disregards its subject's view, refusing to speculate on non-anthropocentric perspectives. Given its technical constitution, microcinematography only facilitates top-down, unidirectional looks, utilising multiple lenses, all convexed to extend sight, blocking others' abilities to gaze back. Microcinematography imposes, to borrow Laura Mulvey's phrase, a radical state of "to-be-looked-at-ness", consequently rendering surveyors' looks exceptional (1975: 11). Furthermore, microscopic technologies require subjects' material transplantation, as ingestion by machinery is prerequisite. Active within laboratories, beings must be brought to them. What is actually gauged is a surface within the apparatus, peopled by beings grown in culture or severed from milieus. Every frame a tiny cage, bacteria only viewable if divested of their worlds. Microcinematography captures beings materially, and conceptually. Disregarding viewpoints and blocking access to semiotic spheres, bacterial claims to existences independent of human animals' are technologically snubbed out. Microscopy and microcinematography tighten the feedback loop by which only human animals are conscious. Consequently, I propose that fresh ways of visualising the invisible are necessary.

Fortunately, bacteria can engage with and productively modify analogue film, a partially organic plateau inviting microbial colonisation. Consider Samuel Falk's (1901-1991) book *Condensed Course in Motion Picture Photography* (1920), where "peculiar star-shaped markings" apparent on "film [...] left in damp, fetid atmosphere[s]" are "found to be due to colonies of bacteria" (163). This observation persists across the 20th and 21st centuries.

Bacterial and fungal presences on film can be highly problematic, write Paul Read and Mark-Paul Meyer in *Restoration of Motion Picture Film* (2000), because they can gouge, or ‘etch’, troughs in the emulsion, which manifest as lasting, even permanent scars which might transfer to duplicates. As in a forest, on film fungi burrow relentlessly in search of nutrients, and beneath the emulsion surface fungal hyphae can form a subterranean network of tunnels and highways (71). Examining cinema’s physical side, a new synthesis of bacteriology and cinema becomes viable. To advance this fusion we must decipher whether bacteria can make moving images on their own terms. To do so, I analyse cinematic media I call biofilms. Though its usage is new, the word is not, as already mentioned. What are biofilms, technically? Biofilms are consortia of bacteria, fungi, or protists splayed across desirable media amenable to microbial colonisation. Microorganisms co-build biofilms by collectively multiplying and spreading on locales that complement microbial desires. Still, I focus on bacteria. Why? Biofilms’ members exhibit distinct modalities of being. Though microorganisms share contiguities of dimension and behavior, they are not ontologically uniform, and constituent beings require unique analyses. I acknowledge biofilms as multispecies consortia yet focus exclusively on bacteria to avoid injustices and heighten analytical precision. Furthermore, I look to the contrasts between *Spirochaeta* and biofilms and, telescoping outwards, what they say about cinema history. *Spirochaeta* typifies a refusal to speculate on others’ viewpoints, utilising an apparatus aligned exclusively to anthropic perspective. On the other hand, biofilms showcase bacterial self-representation, expressing bacteria’s abilities to co-produce art, even if unintentionally. This interplay evinces another inquiry, proposed in chapter 3 by Thomas Nagel and Karel Doing: are more-than-human beings’ subjective experiences comparable in richness to human animals’? These media constitute a microcosm, exemplary of antipodal approaches to understanding human animals’ earthly position. To better signpost the constellation of ideas towards which this microcosm

indicates, I turn to bacteria. Now, we return, as we did with plants, to the ideas of wealth and poverty, in the context of life and expression. Are bacteria, like plants, wealthy in world, even as they ostensibly live in a state of poverty?

Biofilms are not entirely materially or conceptually novel, because biofilms partially coincide with wildlife film, a tradition in filmmaking comprising various overlapping approaches to imaging more-than-humans. At one end of its spectrum there is Claude Nuridsany and Marie Pérennou's *Microcosmos* (1996), employing an advanced technological battery to explore insects' worlds, exuding enchantment in insects' quotidian behaviours. At another there sits Theodore Roosevelt's (1858-1919) hunting documentaries or the Walt Disney Company's zoomorphic catalogue, which shows more-than-human animals entrenched in the humdrum of anthropic life—Donald Duck struggling to pay his bills, and so forth. In either case, generally, more-than-human beings are gazed at or, in *Microcosmos*, their perspective is technologically approximated, sieved through human animals'. However, biofilms are unique in the sense that they look with—not at—more-than-human beings, contingently reliant on bacteria electing to auto-inscript. Biofilms expand wildlife films' scope, inviting more-than-human beings to make art in their own language.

Furthermore, biofilms play on film's gelatin-based emulsion, addressing cinema's compliance in slaughter economies. As mentioned by Nicole Shukin in chapter 1, "The coating of choice for photographic and film stocks is today as it was at the turn of the century, gelatin binds light-sensitive agents to a base so that images can materialize" (2009: 105). Or, as Sarah Allen, conservator of photographic materials and half of Lux and Livre, says in an interview, "All film-based photographic materials (still or moving image) have a gelatin-based emulsion—usually pig or cow" (2022, interview with author). To fungi, analogue film reveals horizontal and vertical depths, impregnated with organic materials amenable to further growth and generation. To bacteria, it may be scurried over, carved open,

or delved into, its ostensibly uniplanar volume excavated like a mine. Physical film tempts and whets bacterial appetites and tastes, issuing an invitation to produce art, even though the hungry, squiggling bacterium may not seek to produce art as such, but rather ingest some delectable material. Biofilms signal a non-anthropocentric confluence of cinema and bacteriology, evincing bacteria's ability to make art appreciable to human animals. Sieved through their makers' bodies, also incorporating (at least some of) their bodies, biofilms are, to borrow Gregory Zinman's expression, "corporeal" media, films employing visceral components—hair, skin, and blood—as generative or creative elements (2020: 108). Like phytograms, biofilms, too, phase into a strange territory of documentary practice. Corporeal film, Zinman says, not only manifests as auto-portraiture or auto-biography, but might even be appreciable as a curious form of documentary cinema. This form proposes a selection of claims concerning its creator, cinema, and the relationship between all 3. These claims, Zinman argues, cannot be matched by photographic means, precisely because corporeal film requires a human or more-than-human artist's physical touch. Alternatively, it passes through their very bodies (Ibid.). Biofilms derive from bacteria ingesting, digesting, and processing analogue film's emulsion, before excreting materials transmogrified. Alembics of a radical alchemy, bacteria navigate, de- and reconstruct, and build their worlds (and artworks) by tracking desirable elements, navigating nutritional pathways, balancing personal and collective needs, processing local chemicals, and excreting new ingredients intended to benefit some bacterium and benefit or wound an ally or enemy. Bacteria primarily exhibit their subjectivity by selectively imbibing, creatively recombining, and carefully exuding. As corporeal films, biofilms are literally produced through, with, and by, bacteria, conveying truths pertaining to bacterial artistry, and cinema. Now, biofilms again phase into wildlife film's orbit. Produced in biological immediacy, squeezed through the complex architecture of the bacterial body, biofilms materially render others' viewpoints, conceivable as embodied

documentaries of bacterial being. Biofilms exhibit bacterial semiosis, a fusion of bacteriology and cinema largely unreliant on asymmetric patterns of looking. This chapter's title, 'strip mining', explores a productive tension between human animals' tendency to destroy the earth and bacterial abilities to process gelatinous film, triangulating cinema, bacteria, and ecological catastrophe whilst glancing towards alternative, more livable futures. In this chapter, I take as my target film-based artworks where bacteria have been invited to grow. Creative subjects (bacteria) co-build a complex architecture (biofilm) on a synthetic scaffold (analogue film) housing an organic material (gelatin) conducive to bacterial growth. Biofilms are, to quote Oron Catts, Chris Salter, and Ionat Zurr, "semi-living": structurally fugitive and undergoing inertia and spontaneous change, moribund yet developing constantly (2022: 115). To archivists, biofilms are a problem requiring solution. An entire industry has emerged to slow their production or erase their existence. Alternatively, biofilms are processual phenomena of generative composition, extant on a creative continuum of bacterial life, nuanced evocations of the biological systems bacteria have been co-building for millennia. Synthesising biofilms and cinema, I trace a non-anthropocentric way of seeing bacteria not in—but *on*—film, tapping a spur into the history of microbiological optics.

I propose a new synthesis of bacteriology and cinema because traditional ways of visualising bacteria are out of sync with new views. Contemporary bacteriology renders our bodies unrecognisable, spotlighting bacterial supremacy, derailing anthropocentrism. Before reviewing this literature, I explore bacteria's function in natural history, before analysing some key biofilms.

MONERA

In 37 BCE, Marcus Terentius Varro (c. 116-27 BCE), commander in Pompey's (c. 106-48 BCE) failed military campaign during Julius Caesar's (100-44 BCE) Civil War, produced *De Re Rustica/On Agriculture* (1934), a guidebook on villa economies. Varro writes that "Precautions must be taken in the neighbourhood of swamps [...] because there are bred certain minute creatures which cannot be seen by the eye, which float in the air and enter the body through the mouth and nose and there cause serious disease" (210). To Varro, bacteria were "animalculae" (211), little animals whose primary objective concerned precipitating debilitation and decay. Two millennia later, by Comandon's time, *T. pallidum* had held Europe in a deadly grip for over four hundred years, possibly explaining why Comandon's research provoked celebration and wonderment over disgust. The film showcased a technological victory over bacteria, who operated like a biological poltergeist, horrifyingly invisible and yet powerfully destructive and seemingly malicious, capable of modifying their environments whilst remaining incorporeal. In Europe, Syphilis first appeared, Colin Eisler explains, around 1490, transported from the New World by Conquistadores, who introduced the terrifying symptoms first to Naples, and then onwards into mainland Europe, and beyond (2009: 48). Syphilis's shockingly phantasmatic proliferation and riveting impacts precipitated recurrent representations in art. Eisler points to Albrecht Dürer's (1471-1528) *Syphilitic Man* (1496), an early woodcut of a German or Swiss *Landsknecht* (a type of soldier or mercenary) bearing syphilitic wounds on exposed flesh. In his painting of Dutch painter Gerard de Lairesse (1665-1667), a sufferer of congenital syphilis, Rembrandt (1606-1669) produced a work at once disturbing and respectful. These representations depict bacterial interventions as

pestilential and parasitic, manifesting in haunting, skeletal visages or weeping, agonising lesions. Conversely, we might re-visit Dürer's contaminated landsknecht or Rembrandt's portrait as illuminating bacterial capacities to take anthropic flesh as substrates amenable to biofilms' production, pointing towards further points of connection between human animals and cinema which, pushed further, also binds human and more-than-human animals through their vulnerable, material bodies. Bacteria may produce visual media by modifying film's gelatinous ingredients and colonising anthropic flesh, as both substrates share ingredient profiles, similarly composed of mammalian matter. As Anat Pick proposes in *Creaturely Poetics* (2011), the human/more-than-human binary collapses at the site of our shared materiality. Bacteria engineer this collapse and illuminate such confluences, when they dive into analogue film and mammalian flesh without discretion. These observations beg further questions about where cinema might occur, begin, and end, and human animals' non-exceptionality. Ancient artefacts offer springboards for contemplating human animal-bacterial-cinematic affiliations, alongside bacteria's startling abilities to ingest our flesh whilst producing cinematic art.

Nevertheless, Ernst Haeckel (1834-1919) was first to systematically articulate bacteria's evolutionary relationship to human animals. Haeckel, in 1868, published *Natürliche Schöpfungsgeschichte/The History of Creation* (1899). Although a devotee of Charles Darwin (1809-1882), Haeckel seeks to outstrip evolutionary theory's primary architect. For Haeckel, Darwin, and Darwin's forerunners in Jean-Baptiste Lamarck (1744-1829) and Carl Linnaeus (1707-1778), did not go far enough. For example, where Linnaeus, in *Systema Naturae* (1735), seeks to document earthly life's variety, he attributes their genesis to divine intervention, proposing that "As there are no new species; as like always gives birth to like; as one in each species was at the beginning of the progeny; it is necessary to attribute this progenitorial unity to some Omnipotent and Omniscient Being, namely *God*,

whose work is called *Creation*” (18; emphasis in original). Lamarck, in *Philosophie Zoologique/Zoological Philosophy* (1963), originally published in 1809, likewise capitulates whilst promoting an evolutionary model. Hugh Elliott, Lamarck’s translator, explains how Lamarck primarily sought to destabilise ideas concerning the fixity of species. During Lamarck’s time, Elliott suggests, it was commonly believed that all species emerged during special acts of creation, at the origin of the universe (1963: xxx). In Lamarck’s system, a deity, after mobilising a law, retreated. Lamarck seeks to uncover such laws so that the deity’s identity may be apprehended. Without such knowledge praise was empty. How could we show gratitude for a deity whose modalities of operation were misunderstood? Accurately celebrating divinity necessitates clearly understanding the divine’s power. For Lamarck, the earth derives from a mechanical process. The deity, a benevolent, but absent, engineer. The mechanism is evolution, as Lamarck explains,

if I find that nature herself [...] has created organisation, life and even feeling [...]; that by the sole instrumentality of needs, establishing and controlling habits, she has created in animals the fountain of all their acts and all their faculties, from the simplest instinct, to skill, and finally to reason; if I find all this, should I not recognise in this power of nature, that is to say in the order of existing things, the execution of the will of her Sublime Author, who was able to will that she would have this power? (41).

For Haeckel, Darwin’s theory erases the necessity of divine intervention as first cause. At the end of the first edition of *On the Origin of Species* (1859), Darwin seemingly leans in this way, writing that

Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from some one prototype. But analogy may be a deceitful guide. Nevertheless all living things have much in common, in their chemical composition, their germinal vesicles, their cellular structure, and their laws of growth and reproduction. We see this even in so trifling a circumstance as that the same poison often similarly affects plants and animals; or that the poison secreted by the gall-fly produces monstrous growths on the wild rose or oak-tree. Therefore I should infer from analogy that probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed (484).

Darwin's vague conclusion did not complement the flavour of the epoch. Consequently, to avoid religious persecution, Darwin's second edition, published 3 months later, comprises amongst other revisions 3 words added to this quotation. "Therefore I should infer from analogy that probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed *by the Creator*" (1860: 484; emphasis added).

Haeckel advances alternative conclusions, contending that human animals' place in universe can be solved by the proposal that human animals are descended from more-than-human animals (1899a: 6). The key difference between Darwin's and Haeckel's proposals is that in Haeckel's system, a deity does not exist, nor is their intervention essential. Haeckel's work comprises two volumes: (1) a genesis of the cosmos, a cosmogony; (2) an analysis of human animals' origin and cosmic place, anthropogeny and anthropology. Haeckel's

trajectory is straightforward. Sidestepping the requirement of a divinity's originary input requires a theory whereby a primordial being can emerge out of 'inorganic' materials, in contrast to a set of pre-existing organic elements (Haeckel 1899b: 414). Haeckel finds answers in the theory of spontaneous generation (415), seemingly unaware of Louis Pasteur successfully disproving the theory nine years earlier. Pasteur achieves this through experiments involving swan-neck flasks. These flasks permit air to enter a chamber whilst simultaneously blocking microbe-rich dust in the bend. Boiled broth stored in the chamber remained sterile until the flask was tipped and dust welcomed inside, after which microbial life would proliferate on the broth within around 3 days. Pasteur shows how beings in the air, rather than the air or materials alone (spontaneous generation), trigger contamination/fermentation. Nevertheless, for Haeckel, via a union of various chemical substances—"carbon [...], oxygen, hydrogen, and nitrogen" (404)—an "albuminous bod[y] ([or] protean matter)" (Ibid.) sprang into life, arising from the cosmic clash of chemicals and rocks. From this rudimentary being life's diversity unfolds.

At life's ultrafringe, Haeckel introduces "Monera" (417), "wonderful organism[s] without organs" (418). "The entire body of one of these Monera, is nothing more than a shapeless, mobile little lump of mucus or slime [...]. Simpler or more imperfect organisms we cannot possibly conceive" (1899a: 189), writes Haeckel. In *Die Lebenswunder/The Wonders of Life* (1904), Haeckel proposes the existence of such organisms without organs" such as "chromaecea"—blue-green algae; or, cyanobacteria—and "bacteria", the key distinction between the two being that chromaecea photosynthesised, exhibiting metabolic strategies normally associated with plants, whilst bacteria engulfed their victims, showcasing mammalian tactics (199). Monera are bacteria. Neither wholly alive nor fully dead, bacteria operate at the mobile borderline separating inactivity and vitality, a being curiously divided, impossibly tugged in two ways simultaneously. Consequently, bacteria were approached in

ways comparable to plants, simultaneously lively and deathly—half-dead, or merely semi-living. Trapped beneath Haeckel’s hierarchy, life grows outwards from bacteria, and yet, beyond supplying contributions as a rudimentary alembic, bacteria do not participate in life’s developments.

Haeckel, in *Generelle Morphologie der Organismen/General Morphology of Organisms* (1866), sketches a tree representing the evolutionary relationships of everything to another, the *Monophyletischer Stammbaum der Organismen*. Three branches are populated by three kingdoms: Plantae, Protista, and Animalia. Monera was not yet a kingdom, rather a subcategory of Protista. Animalia, Plantae, and Protista ascend from a node hovering above the mud. As their common ancestor, Moneres—Monera: architecturally basal, ontologically rudimentary. *Anthropogenie/The Evolution of Man* (1876) includes another tree, the *Stammbaum der Menschen*, or the *Pedigree of Man*. At the tree’s base, mired in the wild tangle and confusion of its roots, sits Monera, the natural order’s new low and so-called Man’s perfect opposite. Bacteria occupy a final threshold before a descent into a murky void populated only by “anorgana” (Haeckel 1899: 5), “the so-called dead or *inanimate bodies*, such as minerals or stones, water, the atmospheric air, etc.” (Ibid.; emphasis in original).

As Haeckel’s root, bacteria enjoy a devastating power. If bacteria ceased to adequately signify, the tree would be deracinated. Within a century, Haeckel’s system would be flipped, and a new tree would emerge with branches plunging into the dark mud and a mayhem of roots surging through the canopy.

BODY WITHOUT ORGANS

In 'The Concept of a Bacterium' (1962), Roger Yate Stanier (1916-1982) and Cornelius Bernardus van Niel (1897-1985) introduced a new view of the world. For Stanier and van Niel, bacteria and blue-green algae had prokaryotic cells. Their cells lacked a membrane separating nucleus from cytoplasm, or isolating photosynthetic machinery in specific organelles. They proliferated by means of fission, not mitosis. Lastly, their cell walls contained a specific mucopeptide as their key strengthening agent (32-33). By contrast, as they explain earlier, eukaryotic cells contain smaller structures segregated by a barrier and containing elements serving specific cellular functions (21). Eukaryotic cells exhibit greater degrees of heterogeneity, containing a nucleus and other membrane-bound organelles. For Stanier and van Niel, whatever was not prokaryote was eukaryote. This view was challenged in 'Phylogenetic structure of the prokaryotic domain' (1977), where George Fox and Carl Woese (1928-2012) explain how previous views proposed a dichotomy based on animal vs. plant. Following Stanier and van Niel, a new dichotomy emerges, as Fox and Woese propose: that of prokaryote vs. eukaryote. The issue for Fox and Woese is that whether animal vs. plant or prokaryote vs. eukaryote, we are left with a rudimentary view of the universe based on rigid dichotomies (5088). Life, rather, falls into three groups: (1) eukaryotes; (2) eubacteria; (3) and archaebacteria, a startlingly distinct group which resembles other

prokaryotes, such as the eubacteria, probably less than they resemble the eukaryotes (Kandler, Wheelis, and Woese 1990: 4577). Furthermore, these archaeobacteria display unique metabolic processes, such as the methanogens (methane producers). Hence their designation as *archae-*. Their ability to survive in intensely harsh environments suggests an ability to survive on an ancient earthscape largely inhospitable to contemporary life. Additionally, as Fox and Woese argue, if, in evolutionary terms, less complex beings generally give rise to increasingly complex ones, then prokaryotes most likely enjoy a primary evolutionary status: they came first (5088). Eukaryotes subsequently stem from a species which engulfed other beings, and towards which all other organisms were endosymbionts, with endosymbionts being creatures who live on or in others' bodies or cells (5089). As Laura Hug et al. explains, Fox and Woese saw all eukaryotic beings as “evolutionary chimera[s] who arose via [an] endosymbiotic fusion, probably involving bacterial and archaeal cells” (2016: 1). Eukaryotes unanimously enjoy archaeal and bacterial lineages. Although eukaryotic beings enjoy purportedly more complex bodies, the most prosperous and ancient mode of life is prokaryotic. Eukaryotic life, argue Fox and Woese, was a somewhat paltry addition to a microbial party, which has been raging for over three billion years. In another paper, ‘Towards a natural system of organisms’ (1990), Otto Kandler (1920-2017), Mark Wheelis, and Woese argue in this view’s favour. As Margaret McFall-Ngai explains, the model proposed by Woese et al. has received significant approval, precisely because it wrestles with the vast diversity of life (2017: M54).

A consensus, aligned with Kandler, Wheelis, and Woese is coalescing. Recently, Laura Hug et al. produced, in ‘A New View of the Tree of Life’ (2016), an image conveying a contemporary view of phylogenetic relationships. Phylogenetics is the study of the evolutionary relationships between beings or groups of beings. Ironically, in ‘A New View of the Tree of Life’, any tree-like symbolism is absent. We see, rather, an exploding web. Three

supergroups, Bacteria, Archaea, Eukarya, and one supplemental one—the Candidate Phyla Radiation (CPR), a large group of bacterial lineages whose members are mainly known only via inference—are represented. Bacteria form an enormous branch, Eukarya a sprig. Any word referring to the anthropos is absent. What’s more, Hug et al. explain, this CPR includes the vast majority of earthly life’s contemporary diversity (1). Today, life’s diversity is predominantly bacterial, and a majority of life’s diversity remains obscure.

Fox and Woese drew on Lynn Margulis’s (1938-2011) work. Margulis, in ‘On the Origin of Mitosing Cells’ (1967), introduces a key hypothesis vis-à-vis eukaryotic cells’ (and subsequently animal, fungal, and vegetal) origins, arguing that the heterogeneity exhibited within eukaryotic cells’ constitution suggests the presence of ancient symbioses (226). Life’s diversity, for Margulis, typifies beings’ desires to intensify their flourishing by partaking of multiplicity, a shifting mosaic of de- and re-coupling, healing infestation and destructive contagion. For Margulis, eukaryotic life is uniformly chimeric at its origin. Concepts like unitary subjectivity fail to apply. In ‘Bodies Tumbled into Bodies’ (2017), Anna Tsing et al. similarly argue on behalf of (especially eukaryotic) life’s monstrosity, by which they mean heterogeneity. Life is monstrous because it is composed of many parts, some of which were acquired through curious liaisons or literal engulfing acts (M5). Symbiosis, from the Greek *sún* (together) and *biōsis* (living), means living together, naming beings’ abilities to intertwine via mutualistic, commensualistic, or parasitic relationships, co-producing livable worlds. A clownfish and an anemone, for instance, a barnacle and a whale, a bacterium and a human animal. Margulis explores, as Donna Haraway writes in *Staying With the Trouble* (2016), “the intimacy of strangers” (60). However, we should not idealise symbiosis as exclusively beneficial. Symbiotic beings can draw from each other detrimentally, even feast on each other entirely, in horrifically ghastly ways.

Symbiosis, with Haraway, transforms into “*sympoiesis*” (58; emphasis in original). This means “making-with”, and it directly contradicts autopoiesis, the phenomenon of self-creation. In fact, sympoiesis engulfs autopoiesis whilst problematising and expanding it (58). Bacteria and archaea were the first to experiment with it (60), Haraway tells us. Beings, Haraway says, don’t just live together. They work together, building multispecies futures. According to Haraway, another word for sympoietic beings are “*holobionts*”, which challenge a traditional biology based on bounded units and essential criteria (58-60; emphasis in original).

Haraway twists symbiosis, making it riff on Barad’s intra-action, itself a play on interaction. Symbiosis, for Haraway, is not muddy enough. With symbiosis and interaction, beings may enjoy others’ company, and yet, despite their unity, remain distinguishable, breaking away unchanged. With sympoiesis and intra-action, things conjoin to make worlds, and themselves. As Haraway says, “Critters do not precede their relating, they make each other through semiotic material involution, out of the beings of previous [...] entanglements” (60). Gilles Deleuze and Félix Guattari say something similar when they explain that “becoming and multiplicity are the same thing” (1981: 249). To be is to become, which means partaking of multiplicity. When we enter into a permanent or fleeting relationship with another being, whether a bacterium or plant, we ourselves undergo change. We cannot enter into such relationships without changing (Ibid.). With intra-action and sympoiesis, caring for oneself is bound up with caring for others. Bacteria communicate the reality of both intra-action and sympoiesis, opening doors to humility and responsibility.

Holobionts help shunt thinking into novel frontiers. Holobiont theory emerged in the 20th century, through Margulis’s writing in 1990, but also Adolf Meyer-Abich’s (1893-1971) in 1943. Scott Gilbert, Jan Sapp, and Alfred Tauber explain that holobionts are “integrated communit[ies] of species” (2012: 334). Holobionts are sympoietic tangles. Gilbert, reviewing

the termite *Mastotermes darwiniensis*, Australia's Giant Northern Termite, offers a "poster organism" for holobiont theory (M75).

The termite eats wood. It eats trees. It eats houses. It is a major agricultural pest.

Only, it cannot eat wood. It does not have a genome that allows it to eat wood. What it has inside its gut is a symbiotic protist, *Mixotricha paradoxa*, that eats the wood.

Only, it doesn't. *Mixotricha* is a composite organism containing a protist and at least four different types of bacteria. Termites are thus composite organisms all the way down. Bacteria and protists act together to make *M. paradoxa*, which is essential to the functioning of the gut of a termite, which itself lives in a termite community. So what is the individual? (Ibid.; emphasis in original).

Margulis has also examined *Mixotricha paradoxa*, explaining that *M. paradoxa* can be approached as five kinds of creatures, working in partnership. Many spherical bacteria thrive within the nucleated cells, whilst *Treponema spirochetes* writhe along such a formation's surface, alongside a compliment of large rod bacteria (qtd. in Haraway 61-62). *Mastotermes darwiniensis* is a nested ecology, like a cow. Cows, as Gilbert explains, cannot actually eat grass, despite the fact that whenever one thinks of a cow, they imagine a bovine being chewing grass into cud. The bovine genome lacks the proteins required to digest cellulose, and breakdown grass. Rather, what cows possess is a symbiotic community of micro-organisms capable of digesting the grass on their behalf. These thrive inside the cow's gut, and as cows shunt vegetal matter into the complex machinery of their various stomachs, micro-organisms extract nutrients from the plants, before presenting them to the cow. The cow is made possible by such transactions, just as the micro-organisms are reliant on the cow

to exist (2017: M73). Becoming-with volumes of allies and enemies, resulting from sympoietic mechanisms: cows, termites, and bacteria propose entangled theories of life.

Human animals, too, are holobionts, like termites. Gilbert, Sapp, and Tauber confidently state that “For animals, as well as plants, there have never been individuals” (336). “Symbiosis is the way of life on earth”, Gilbert continues (M84). “[W]e are all holobionts by birth” (Ibid.). McFall-Ngai, investigating human animals’ “fundamental microbial-ness” (2017: M52), builds on Gilbert’s work. McFall-Ngai explains how human beings—designated as ‘individuals’—are not truly individual at all (Ibid). Human animals’ bodies are predominantly composed of more-than-human cells, rendering human animals less human, and more microbial (Ibid.). Human animals’ cellularity succumbs to more-than-humanity. Gilbert, Sapp, and Tauber explain how the cells within human animals’ bodies are 90% bacterial (327). One’s genome—“the secular version of the soul” (Gilbert 2017: M76), the “biological blueprint for a new individual” (Ibid.)—is fundamentally more-than-human, too. Gilbert, Sapp, and Tauber continue, explaining how human animals’ guts contain around 1000 major bacterial groups, which cumulatively offer a gene set 150 times larger than that brought by human animals’ genome. This number does not even include the micro-organisms housed within our airways, mouth, reproductive orifices, or skin, all of which host a rich complement of microbial life. (327). More precisely, Gilbert argues, whereas human animals enjoy around 22,000 different genes, our bacterial companions contribute 8 million more genes (2017: M76).

Bacteria generously share their own genes, offering new traits. This method of transference is called horizontal gene transfer (HGT), as McFall-Ngai et al. explain, “For instance, the gut bacterium *Bacteroides plebeius*, found in some Japanese people, bears a gene transferred horizontally from the marine bacterium *Zobellia galactanivorans*, giving the gut symbiont the capacity to degrade seaweed polysaccharides” (3231; emphasis in original).

Without HGT, many activities, maybe even survival, would be impossible. Herbivory would become untenable, vegetal photosynthesis may have never emerged. Today, HGT is regarded as evolution's primary catalyst. As Eugene Koonin, in 'The Origin at 150' (2009), writes, HGT is the rule, not exception, and that the means of HGT, such as viruses of infections, are ubiquitous and ever-present (474). Consequently, evolution does not progress through successive moultings of manic yet impersonal butchery and bloody extinction but hospitable processes of cellular sharing and genomic exchange perfected by bacteria, bulldozing our claims to exceptionality. Gilbert argues that "Developmental symbiosis has literally queered [...] our origin story, [...] adding an important layer of interactive non-heterosexual intercourse – the microbes" (2019: 15).

However, a wrinkle needs be checked. For example, Gilbert and others regularly mobilise a dynamic comprising larger host and supplemental symbiont. Holobiont describes the organism as composed of host and symbiont (Gilbert, Sapp, and Tauber 327-328). Whereas Haraway's deployment of Holobiont, like Margulis's, disrupts the distinction between host and symbiont because every being is a symbiont to every other (Haraway 60). Etymologically, holobiont comes from the Greek *hólos*, whole, and *bioûn*, to live. Holobiont comes freighted with views of whole, bounded organisms, possibly shoring up old dichotomies. The asymmetrical relations within words like 'host' and 'symbiont' must be abandoned. We need ways of considering the links between symbiotic beings that maintain beings' distinction whilst acknowledging their equity. There are no hosts, only radiating clouds of symbionts coming together in provisional moments of indefinitely short or long connection. Advancing fresh worldviews requires abandoning every unsavoury residue, however small.

Deleuze and Guattari find a companion in bacteriology. How? Recall Haeckel's description of bacteria, as 'wonderful organisms without organs'. Through Haeckel, we reach

Deleuze and Guattari's "Body without Organs", the "BwO" (1981: 150). What is the BwO? They say that the BwO is the enemy of the organism (158). What is the organism? In the highly influential 'The Concept of Virus' (1957), André Lwoff (1902-1994) proposes that "An organism is the result of the integration of its dependent and interdependent parts. The essential character of an organism, independence, with all its implications, transcends the characters of its parts, dependence. Life is precisely this transcendence" (16). We are, again, in the uncomfortable territory of 'life'. As Haeckel writes, "*Organisms or Organic bodies* [are] combination[s] of various parts (instruments or organs) which work together for the purpose of producing the phenomena of life" (1899: 5; emphasis in original). But what is 'life', whose definition Haeckel accepts as a given? Organisms seemingly emerge through the conjunction of auxiliary bits, inscribing within every being an internal hierarchy pitting parts against wholes. A murky jumble unifies, securing organisms' transcendence. Organisms transcend their material backgrounds, separated from subordinate components. The difference between organism and supplemental part, wholly ungraspable, yet abides by an order of magnitude, navigable only by slippery words: life, so forth.

Deleuze and Guattari decry organismic unity as bodies' reality, arguing that

The organism is not at all the body, the BwO; rather, it is a stratum on the BwO, in other words, a phenomenon of accumulation, coagulation, and sedimentation that, in order to extract useful labor from the BwO, imposes upon it forms, functions, bonds, dominant and hierarchicalized organizations, organized tendencies. [...] For the judgment of God weighs upon and is exercised against the BwO; it is the BwO that undergoes it (159).

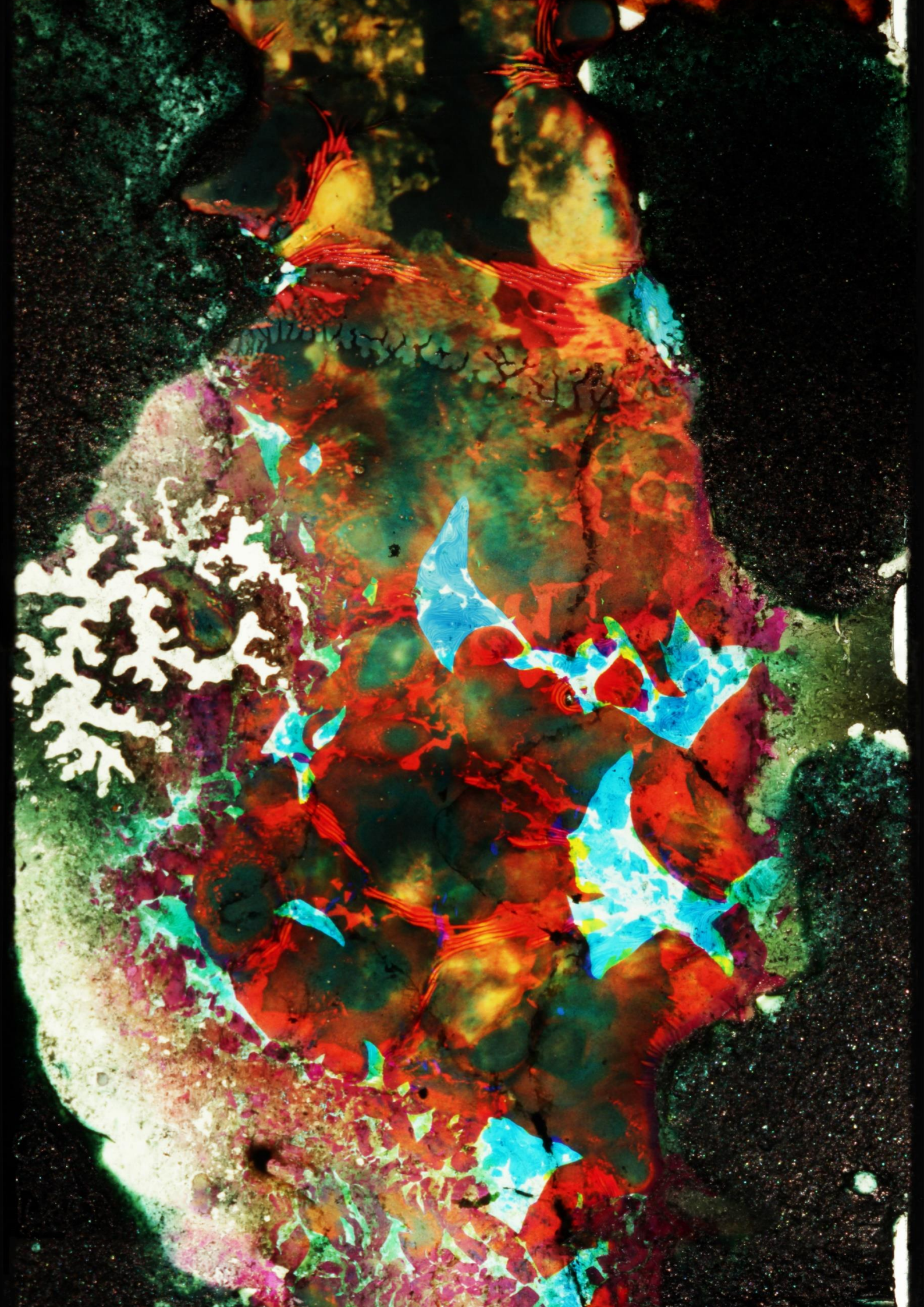
They flip the schema. The BwO is the body conceived as indefinite multiplicity, writhing materiality. Built on the BwO, the organism is an event of “overcoding” (8), an attempt to turn BwOs into something productive, usable. Yet the BwO does not precede the organism. The BwO exists alongside the organism, and they exist in a constant relationship of tension (164). Overcoding is immanent, always happening right now. The BwO “is that glacial reality where the alluvions, sedimentations, coagulations, foldings, and recoilings that compose an organism [...] occur. [...] It is the BwO that is stratified. It swings between two poles” (159). As Brett Buchanan writes, we might call any being an organism. Doing so offers a solution insofar as it helps us account for, and more importantly fix, such a living being’s actuality, history, and constitution. However, doing so also presupposes a radical plurality of elements that impact such a being’s past, present, and future actualisations (2009: 153). Accepting the BwO precipitates repercussions. We acknowledge an infinity of relationships, refuting human exceptionalism. Furthermore, as Deleuze and Guattari explain, “The BwO is a component of passage” (158). Adopting the BwO, we think rhizomatically, becoming rhizomatic. BwOs exist on a matrix synthesising life. This matrix is “the plane of consistency” (157), also “sometimes [...] the BwO” (Ibid.). With this confusing symmetry, Deleuze and Guattari suggest that no body ends at its perceptible boundary. Conversely, bodies flower into broader, cosmic unities. Body and cosmos are linked, plugged into one rhizomatic assemblage.

How might we explore the BwO? “You don’t do it with a sledgehammer, you use a very fine file”, they explain (Ibid.). This is a process of discovery that exceeds self-destruction. Conversely, one must open their eyes, and body, to all the relationships that contribute to their composition, longevity, and on-going development (160). Indeed, Deleuze and Guattari tell us exactly how to achieve about such a perspective, proposing that

This is how it should be done: lodge yourself on a stratum, experiment with the opportunities it offers, find an advantageous place on it, find potential movements of deterritorialization, possible lines of flight, experience them, produce flow conjunctions here and there, try out continuums of intensities segment by segment [...]. It is through a meticulous relation with the strata that one succeeds in freeing lines of flight, causing conjugated flows to pass and escape and bringing forth continuous intensities for a BwO (161).

It is not about *dis*-organising the body. “It is not at all a question of a fragmented, splintered body, of Organs without the Body (OwB). The BwO is exactly the opposite” (164). It is about embracing *de*-organisation, about welcoming collectivity and multiplicity, about accepting one’s placement inside an assemblage (165). The BwO is reached by investigating the body in fresh ways. Ways presupposing an entire assemblage. Therefore I elect to lodge myself on the stratum of experimental cinema, exploring bacterial artistry.

Investigated through bacterial agency, our bodies radiate non-anthropocentric fault lines moving towards multispecies futures. Lines of flight splay outwards from our rudimentary corporeality into deep, evolutionary pasts, and back to messy, sympoietic futures. Towards other, seemingly disparate beings, and sideways to far flung operations. Then always back to yourself, where radical self-reflection renders anthropocentric ideas untenable. Amidst ecological crisis, we might follow bacteria. What happens to cinema when bacteria are perceived to make it? My forthcoming analyses advance answers by exploring biofilms.



On previous page: Fig. 6, Reeves, *Landfill 16*.
Image courtesy the artist.

Bacteria, in conjunction with fungi, have literally and figuratively split the image open, mining into the image plane and even beyond to explore and bring back images of photochemical film's multi-planar volumes. We can clearly make out a patch of fungal hyphae to the top left. It as if, peeling back a superficial layer, a further, deeper image and set of truths concerning cinema have been exposed.

What stories do we uncover here, deep within the image? This dynamic excavation literally and metaphorically communicates biofilms' power, as devices for precipitating revelatory views aligned with bacterial, fungal, and microbial subjectivity.

UNDERGROUND CINEMA

In 'Zombie Media' (2012), Garnet Hertz and Jussi Parikka propose an art methodology rejecting consumerism's fast-paced demands, specifically the paradigm of planned obsolescence wherein everything enjoys a (shelf-)life and a preordained, untimely pseudo-death. They explain that "Instead of using electronics to explore or develop cutting-edge technologies, this approach uses 'trailing edge' every day and obsolete technologies as its key resource" (426). They draw attention to, and creatively redeploy, those things which, even though ostensibly dead, wreak environmental havoc from beyond the grave. "Zombie media is concerned with media that is not only out of use, but resurrected to new uses, contexts and adaptations" (429), they argue. Hertz and Parikka are speaking metaphorically, but also literally. They extract inspirational and material value from the living dead of present and past media forms, all of which signal and precipitate planet earth's actual destruction and death, given such artefact's tendency to leak toxins and chemicals into the world once discarded (2012: 247). At this stage of the thesis, the concept of zombie media resurrects the key questions of life and death through the ghastly prism of undeath. Even after disposal, technology remains only half-dead, capable of being resurrected towards new projects. Alternatively, if left alone, media will leak destructive toxins into the world, remaining deadly even whilst ostensibly dead. How can bacteria intervene in this scenario, I wonder, perhaps by pulling our attention towards the lively afterlife of cinema's trashed components? Doing so would mean alerting us to cinema's compliance in accelerating planetary

catastrophe whilst possibly showcasing how to jam this troubling, destructive loop. To propose an answer, I investigate zombie media in conjunction with biofilms, audiovisual and biological media in which film strips wriggle, squirm, and writhe like the disquietingly decomposed flesh of the ramshackle zombie, preternaturally unleashed from the quiet of the grave.

Hertz and Parikka are trying to radicalise media archaeology. Erkki Huhtamo and Parikka (2011) provide a description of media archaeology, which asks where does new media—the Internet, virtual reality, digital media, etc.—start? What of contemporary media’s relationships to former models, obsolete components, and never-completed projects—dream-machines and crazy inventions? Is a break from old to new discernible? (3) Media archaeologists, Huhtamo and Parikka explain, sceptical of media history’s traditional, linear narratives, work through such questions, problematising media history’s dominant accounts, and exploring alternate historical timelines—and future trajectories (Ibid.). Thomas Elsaesser (1943-2019), in ‘The New Film History as Media Archaeology’ (2004), quoting Noël Burch, describes media archaeology with a quirky phrase: “As Burch liked to say: it could have been otherwise...” (81). Media archaeology struggles with the flows of media’s cloudy history via analyses of extant, but also fantasy and never-actually-made, media.

Yet media archaeology apparently lacks an ecological dimension. Huhtamo and Parikka suggest that media archaeology and traditional archaeology are distinct disciplines, experiencing unique analytical strategies and targets (3). For example, industrial archaeologists analyse industrial ruins to discover clues regarding former economic and social habits. Conversely, media archaeologists analyse media archives, as well as made or merely imagined artifacts, to discover clues regarding present and past cultures (Ibid.). But what of those corporeal bodies and geological materials that subtend and remain perceptible within moving imagery, if we look close enough? What of those lively materialities ingested

by machines? In *Geology of Media* (2015), Parikka wonders, what of media products' origin, life, and death? What if we were to trace the lifespan of those materials that go into such products' creation, monitoring their extraction from, and abandonment to, a seemingly ever-expanding colonial frontier? What, Parikka asks, if there was such a thing as a *geology of media*, by which Parikka means a method of analysis that looks beyond the immediate product or its achievements to consider the geological histories and operations subtending its creation, existence, and afterlife (3). "Media materiality is not contained in the machines", Parikka continues, "even if the machines themselves contain a planet." (139) For Parikka, machines signify as nexuses or nodes bridging material geologies and the geopolitics of, for example, geological materials' prehistoric formation and contemporary extraction, in conjunction with the afterlives of electronic waste (139).

This approach to media analysis, Parikka suggests, simultaneously inspires a look inside the machines, and a consideration of the networks within which the machines are created, and discarded (2012: 97). Hertz and Parikka instruct us to investigate media as junctions comprising various ingredients and temporal currents, as media through which more-than-human beings and elements flow, and get painfully caught up. Work to 'depunctualize', say Hertz and Parikka: "investigate media "a[s] circuit[s] of dependencies and infrastructures" (2012: 428). What does it mean to depunctualize, according to Hertz and Parikka? It means breaking open black boxes and locked up media systems, exploring their as-of-yet inactive possibilities; in short, exploring what they materially are—and can do. It also includes an ecological and temporal dimension, as it means rejecting the urge to make more by using what is already available, and slowing down to spend time to intimately get to grips with, inside and out, what one has at hand. This subsection answers this call, playing with zombie media. Activating neither an archaeology nor a geology, but a bacteriology of cinema, it reads moving imagery through bacteria and bacteria through moving imagery,

advancing an analysis which, though surveying analogue film's ability to satisfy bacterial appetites, proposes a view of cinema as not exclusively anthropogenic.

Ironically (*ironic* because associated with zombification) the methodology proposed by Hertz and Parikka is very much alive, bearing no relationship, in a practical sense, to undeath whatsoever. Burying or otherwise abandoning film is a strategy employed by many contemporary filmmakers. Tomonari Nishikawa, in *sound of a million insects, light of a thousand stars* (2014), sequestered a 30 metre roll of film beneath a pile of leaves by a country road roughly 25km away from the Fukushima Daiichi Nuclear Power Station. Nishikawa sought to investigate the nuclear radiation left behind after the Fukushima Daiichi Nuclear Power Station disaster of 2011. Nishikawa's film swerved into a "cinematographic half world" (2022, interview with author), as filmmaker Jürgen Reble might say. Litvintseva notes how Nishikawa's film includes images made *by*—not *of*—radiation. The images are produced by means of material impact, as radiation and irradiated materials score the strip (2019: 87). Similarly, David Gatten, across the *What the Water Said* series (nos. 1-3, 1998; nos. 4-6, 2007), stuffed some analogue film into a crab trap, tied the trap to his ankle, then jettisoned it off the South Carolina coast. Zinman states that although the films provide us with a sequence of abstract images, they can be approached as documentaries that raise questions concerning the nature of authorship as well as the ability of earthbound materials and more-than-human beings to contribute to cinematic artefacts' construction and meaning (2019: 111). These reflections bring me to *Stadt in Flammen/City in Flames* (1984), which Kim Knowles refers to as a seminal example of 'weathered film' (2020: 78), made by Schmelzdahin, a collective including Jochen Lempert, Jochen Müller, and Reble. *Stadt in Flammen* comprises various cuttings from B-movies Schmelzdahin acquired from bargain buckets and other marginal sites. Sequences containing anthropic actors were extracted, severed from their context, and stitched back together. *Stadt in Flammen* consequently lacks

narrative consistency, anthropic actors' movements becoming comedically meaningless, dismantled from any tangible significance.

Echoing Karel Doing's framing of "cinema [a]s an intermediate" between my world and a plant's, a medium capable of "perceiving signals that would normally exist beyond our event horizon" (2022, interview with author), Reble, in an interview, explains how "the loss of control" precipitated by abandonment attains "a positive tenor. It expands my horizons and opens my eyes to things which I could never expect" (2022). *Stadt in Flammen* pursues a "communication process" (Ibid.) or "universal" form of "communication" much "more multiplex" and myriad "than human communication based on language" (Ibid.). Reble describes *Stadt in Flammen* as a "bacteriogram" (Ibid.): a type of writing with, and by, bacteria. To reach bacteria, *Stadt in Flammen* was tossed haphazardly into a dark corner of Reble's "great garden in a suburb of Bonn" (2022) and worked by the weather of a scorching summer for over six months. Writing in 1992, Reble explains how

One day, I [...] decide[d] to toss my film into [...] my garden. [...] Half a year later, when I already had forgotten about the film, I found it again by chance. The colour layers had burst open and had been eaten away by bacteria [...]. [...] On the copy it looks as if the film was pulsating.

Anthropic desertion welcomed bacteria's proclivity to colonise gelatin-based film.

Consequently, we can approach desertion in this context as a generous, hospitable act. Going forward to step backwards, Schmelzdahin courted contingency as a vector of creativity, inviting bacteria to produce cinematic art. Schmelzdahin mobilised whilst slowing down, synchronising with bacterial dynamism.

Working with bacteria, Schmelzdahin depunctualize. Investigating analogue film's ability to satisfy bacterial tastes, Schmelzdahin excavate film's customarily veiled ingredients. Bacteria expose analogue film's employment of gelatin. In an interview, Allen explains how "Film is a petri dish. When you deal with film, what you are primarily dealing with is different types of plastic layered over by gelatin and infused with silver. Bacteria really love the gelatin layer. Gelatin is a source of food, essentially, for bacterial growth" (2022). Gelatin, a derivative of boiled more-than-human animal bones (usually porcine, occasionally bovine) produces the literal and figurative background out of which moving imagery can emerge. Though any analogue film—bar some extremely rare outliers like Alex MacKenzie's *agar-agar* (2017), which utilised agar-agar, and Josephine Ahnelt's and Esther Urlus's experiments in producing a vegan film stock by substituting polyvinyl acetate (PCA) for gelatin—requires gelatin, gelatin's inclusion is perennially overlooked, rendered increasingly invisible by the procedures of development, and the science of photochemical film production. As Shukin argues, gelatin is often manufactured in secrecy, taking place in the aptly-named darkroom, whilst its production involves the mastery of a series of chemical interactions bordering on alchemy. The phenomena of darkness, isolation, and secrecy enveloping analogue film product serves to thicken the mysteries concerning image culture's reliance on specific materials, such as creaturely gelatin, whose crucial impact on cinema history and production is at least overlooked, if not actively masked (2009: 105). Gelatin is moving imagery's deep background, abiding by one of film editing's most enshrined utterances: when it works, it goes unnoticed. *Stadt in Flammen*'s distressed imagery derives from bacteria enzymatically processing analogue film's gelatin-based emulsion. Relaying gazes from false depth to physical façade, Schmelzdahin disavow gelatin's invisibility. Feeding on it, bacteria reveal evidence of cinema's material, long-standing reliance on industrialised slaughter, as outlined in chapter 1 through analysis of Shukin's *Animal Capital*

(2009). Bacteria reracinate cinema, connecting it to its bloody past, present, and future, rooted in practices of corporeal and geological extraction.

Dinesh Wadiwel, in *The War Against Animals* (2015), frames the violences directed against more-than-human animals by us as a war. Matthew Calarco, introducing Wadiwel's book, writes that such a war against animals marks the framework against which all human/more-than-human relationships can occur, and consequently it goes regularly unnoticed. Nevertheless, and even as its existence is simultaneously actively masked and completely available, such a war exhibits a degree of violence and destruction otherwise unseen in history. The use of highly developed tactics and strategies spanning marketing and archaeology serve to hide this war and its effect whilst rendering its occurrence the exception, when it is in fact the rule (ix). This war wages amidst white hot centres of torture and an orbital penumbra comprising many seemingly unrelated frontiers, some of which may initially register as benign, even genial. Cinema is a key yet often overlooked theatre of conflict. This does not imply two-way confrontations, although creaturely resistance is occasionally verifiable, not least, perhaps, in gelatin's profound connection to bacterial and fungal appetites, with microbial desire scanning as a conspiratorial intervention targeted at rejecting human animals' thin control over more-than-human animals' materiality and, more generally, creaturely (after)lives. Furthermore, we could equally approach gelatin production through the prism of bio- or genocide. A bloody trail tying periphery and centre, gelatin binds cinema and abattoir, whilst analogue film is a by-product of creaturely murder, as creaturely murder is a byproduct of cinema. Schmelzdahin make imagery by directly invigorating photochemical film's gelatin layer, pulling focus on cinema's reliance on, and acceleration of, anthropic violence directed towards more-than-human animals. Bacteria deny cinema's ability to transcend its contexts of production, illuminating one way in which cinema partakes in, and advances, a planetary war. Bacteria block transcendence.

Schmelzdahin invigorate analogue film's bloody backdrop, exhuming a territory of critical reflection, appropriating cinema's own body to apprehend its violent history, present, and future. Employing found footage, Schmelzdahin utilise old media, repurposing from obsolescence. Employing direct animation techniques, *Stadt in Flammen* is, more accurately, a direct *re-animation*. Toying with an extant work, old imagery is reactivated, an ostensibly exhausted analogue film's granular configuration de- and recomposed by bacteria. Like a painter's palette gone dry then re-wetted, an amalgam of colours and forms is resurrected, drawn from to etch new views. Schmelzdahin employ pre-existing nodes of a violent machinery and rework them, exploring their capacities to signify in a style contrary to that machinery's dictate. Bacteria make old images move in new ways.

Typically, film is handled with a hygienic impulse and purism blending fetishism, reverence, and fanaticism, and the conservation of photo- and cinematic media exalts the usually humdrum act of cleaning until it coincides with the production of art, perhaps becoming itself if not an art form then, surely, an artisanal craft. Conservation manuals read like a book of hours, bearing repetitive prescriptions to be carried out indefinitely, regularly in isolation. According to multiple manuals, analogue film must be stored at “-18° to 23°C” (Blasko, Luccitti, and Morris 1992: 50); it must not be stored “near X-ray sources” or subjected to “scanning devices [...] by postal authorities and airlines” (Ibid.); it must be kept “at least 15cm [...] off the floor” (51); when handled, only the “edges” may be touched (52); any “[f]olding and crimping” is prohibited (Ibid.). “[P]articles of dust resting on the film” must be removed (Falk 163); the integrity of “the supply pipes” providing “the wash water” should be verified lest any “particles of iron” should infect “the surface of the negative” (Ibid.); every droplet of water involved in the washing process must be filtered (Ibid.). A “needle” should be used to “probe the image” for mould “growth[s]” (Meyer and Read 72); “frost-free refrigerator[s]” must be utilised to provide “humidity-controlled micro-climate[s]”

for storage of both color and black-and-white photographs” (Wilhelm 1993: 561); every roll should be “tightly seal[ed]” within “a second plastic container or can” (Blasko, Luccitti, and Morris 51). If such behaviours fail to occur, film will succumb to bacterial colonisation. As Allen explains, “Bacteria will always grow if the environment is right. [...] It would be very unusual for me to visit a collection and not find any mould. [...] My work is a constant battle against mould”. Analogue film’s susceptibility to, and fundamental connections with, bacteria always lurk nearby.

A truism: cinema is always already more-than-human, and not only because it is beholden to machines. If analogue film is to fulfil its duty and signify correctly, a material, more-than-human reality must be policed. If maintenance slips, even slightly, colonisation will occur. Allen explains how

The [...] damage will manifest itself in many ways. You may end up with mould on the surface of the emulsion [...]. You may find [...] strands which flow outwards from a central point. [...] Film’s anti-halation layer [...] will react and revert back to its original state. [...] Mould [will] track [etches] in [the] gelatin layer.

Bacteria will proliferate on photochemical film if left unsupervised. Abandoned to its own devices, bacteria will always de- and re-code physical film, bringing analogue film back to that which gets overcoded: analogue film’s more-than-human, or more precisely, geological and mammalian materialities. To colonise, bacteria require surfaces infused with organic material amenable to their growth, and humid, warm environs, besides time, preferably lots. Analogue film, especially when buried, offers such ingredients en masse. Photochemical film’s specificity complements bacterial styles of communication, nutrition, and

reproduction. Analogue film is never not becoming-biofilm. If abandoned, analogue film will always invite bacteria in, its creaturely body offering irresistible summons. A vast economy, besides an army of professionals and a battery of practices and institutions, derive necessity from the fact that every analogue film is firstly, and always facultatively, a biofilm. Film is only ever not a biofilm for a brief time, and only under the strictest, most hygienically sterile and meticulously maintained conditions. Archives and technologies of preservation block analogue film's becoming-biofilm. Yet cinematic and bacterial harmonies abound.

Schmelzdahin submit cinema to bacterial dynamism, denying industrial tendencies to materially and conceptually deracinate cinema from its contexts of production, and erase more-than-human interventions. Earthed and unearthed, abandoned and reracinated, digested, processed, and reanimated, bacteria identify analogue film as constitutively more-than-human. Bacteria, identifying analogue film's amenability to colonisation via its inclusion of organic gelatin, excavate cinema's constituent inhumanity.

Bacteria warp cinema, shunting it into new territory. Denaturing means stripping away, or altering, things' former properties. Bacteria denature cinema. Actually, they re-nature it, returning it to its proper, more-than-human state. Bacteria gesture towards the cinematic BwO, the glacial, material reality that archivists, artists, and industrialists over-code to make cinema satisfy human-centred systems of meaning and perception. Projects of film conservation and preservation actually *de-nature* cinema, targeted at policing, if not erasing, film's more-than-human agendas, components, and desires. As Allen writes,

If film has been previously colonized by bacteria, the nature of the gelatin changes. [...] Once mould has already affected a gelatin layer, it becomes denatured. Once gelatin is denatured, it's far softer. It becomes more hydroscopic, more viscous. When

film has been denatured, the gelatin layer will simply slide off the surface if washed with aqueous solvents. Afterwards, it's still usable, but it's much more vulnerable. It appears the same—you'd have to do a spot test to discover such an issue. But the nature of it would've changed.

Bacteria surge across and dive into analogue film's gelatin-based emulsion, partnering with animals, fungi and many other microbes to do so, redefining analogue film as an earthly amalgam of more-than-human ingredients. Exposing cinema's constituent materiality excavates points of productive connection between cinema and world, routes through which more-than-human beings can take part in producing cinematic art. Bacteria twist analogue film into a medium capable of welcoming earthly beings into new spheres of recognition.

Stadt in Flammen invites contemplation of anthropic edibility. Schmelzdahin expose an anxious territory of ontological obscurity. At least in the west, human animals' edibility is widely sequestered, even after death. Coffins entomb the corpse, barricading bodies from material vicissitudes. In cinema, too, as Anat Pick contends, anthropic edibility is veiled. When it does occur, as in *Jaws* (1975), it is represented as breaking or going against the very laws of nature (Pick 2018: 138), inspiring revenge. Highlighting human animals' corporeal vulnerability is often radical. As a manoeuvre, it enjoys a non-anthropocentric trajectory. For Pick, facing edibility can throw us into an alembic which squeezes, partially digests, and excretes us transfigured (Ibid.). This is what happened when Val Plumwood (1939-2008), canoeing in Kakadu's wetlands, was nearly eaten by a crocodile. "Few of those who have experienced the crocodile's death roll have lived to describe it", says Plumwood in 'Human Vulnerability and the Experience of Being Prey' (1995),

The roll was a centrifuge of boiling blackness that lasted for an eternity, beyond endurance, but when I seemed all but finished, the rolling suddenly stopped. My feet touched bottom, my head broke the surface [...]. I had just begun to weep for the prospects of my mangled body when the crocodile pitched me suddenly into a second death roll (31).

Plumwood's encounter did not precipitate a lust for revenge, rather instigating a recalibration of belief. Alongside the crocodile's death roll, a killing manoeuvre performed by rapid corkscrewing along the crocodilian body's longitudinal axis, Plumwood succumbed to a horizontalising momentum. Crashing into her "own animality and ecological vulnerability" (32), Plumwood witnessed her proximity to other animals and how, though edible, every animal exceeds their consumption. More-than-human animals are meat and more-than-meat. "It was a shocking reduction, from a complex human being to a mere piece of meat. Reflection has persuaded me that not just humans but any creature can make the same claim to be more than just food. We are edible, but we are also much more than edible" (Ibid.). Calarco's reflections chime with Plumwood's analysis, as he proposes the existence of a 'zone of indistinction' that opens up whenever we acknowledge our shared embodiment and vulnerability with more-than-human animals (2015: 58). This zone can be the source of profound multispecies empathies, based on recognising how human animals share fundamental similarities with more-than-human animals, grounded in our shared materiality. As Deleuze, in *Francis Bacon* (2003), tells us: "Pity the meat! [...] Meat is the common zone of man and the beast, their zone of indiscernibility" (23).

Schmelzdahin convey human animals' edibility by pinpointing animals' general edibility. Any fleck upon *Stadt in Flammen* is symptomatic of a susceptibility to bacterial

consumption towards which human and more-than-human creatures are equally vulnerable, as Dürer's depiction of the festering landsknecht in his *Syphilitic Man* shows. *Stadt in Flammen*'s imagery scans as worn and puckered skin, melting flesh punctuated by tiny suns. Schmelzdahin's film furnishes a view onto some frothy, volatile ooze, a roiling territory perched somewhere between the complex intricacies of mosaics and the likewise complex bio-art of mould. Bacteria's work is mysteriously captivating, registering as a whirling portal or viscous volume of agitated mercury beneath whose semi-solid surface oddly quotidian images coalesce only to repeatedly undergo liquefaction, breaking apart as frequently as they appear. Cracks form across the strip's eroded surface, a sheet of ice about to shatter. Tears blossom and pop like cantankerous pustules, exhuming depthless backgrounds of blazing white. Lesions further mark the already distressed work, vertical splices interrupting a topsy-turvy camouflage of every hue. Reconfigured nearly beyond recognition, the cost of the Stygian trip across a zombifying boundary of death and vitality has amounted to an almost unpayable toll, with the strip bearing the marks of its journey on its body. Displaying material manipulations wrought by bacteria processing analogue film's gelatin-based emulsion, Schmelzdahin show creaturely bodies' susceptibility to bacterial colonisation, and, by extension, their vulnerability and edibility. The prism of decay does not provide a sufficient framework for analysis. Linguistically, decay bears negative connotations, comparable to rot and degenerative, instigating a regressive momentum. However, in *Stadt in Flammen*, we are watching a joyous and raucously festive event. Bacteria are ingesting gelatin and collectively pullulating, creating bacterial communities alongside new cinematic forms. The film is not decaying. It is mobilising towards higher regions of creativity, generation, and life.

Nevertheless, gelatin, flowing outwards from the abattoir, is only really tied to more-than-human animal bodies. Human animals are never dissected and macerated, their skeletons removed and boiled to facilitate moving image production. Analogue film overtly

conveys more-than-human animals' free edibility, tacitly veiling that of human animals' edibility. My argument overlaps with Carol J. Adams's in *The Sexual Politics of Meat* (1990) through her concept of the 'absent referent'. Behind every moment of more-than-human animal consumption resides an absence, namely the creature destroyed and consumed. The absent referent names the processes of conceptual and material fragmentation whereby the consumable item's relationship to a living creature is masked, facilitating anaesthetised alimentary pleasure and consumption. In *Stadt in Flammen*, bacteria deny such procedures, pulling focus on the living material and thus more-than-human creature that was reduced, simmered down to a molten glue, infused with light-sensitive silver, and then applied to a plastic backing. Bacteria render cinema's absent referent present. Additionally, human animals regularly evade symmetry with more-than-human animals. Though anthropic bodies are equally amenable to gelatin production, many use gelatin without detecting such overlap. Gelatin evades sundering contemplation. However, wherever gelatin's edibility is witnessed, so might we witness human animals' edibility. Cultivating such views is challenging, but maybe possible. Showcasing digested gelatin besides visibly digested human animal bodies, Schmelzdahin forge a space where we might contemplate our own edibility. Schmelzdahin invite viewers to become-gelatin, to witness, as Calarco might say, their "being-towards-meat" (2014: 423). Bacteria advance recalibration.

Stadt in Flammen displays human animals overwhelmed by infestation, exhibiting views wherein human animals appear eaten. Faces swiftly melt and bodies gradually melt, nibbled away chunk by chunk. Flesh sloughs off, comingling with a tumultuous background that shoves frontstage, demanding attention. Additionally, the anthropic actors of *Stadt in Flammen*'s found footage are rendered mute. I stipulate 'anthropic actors' and 'original footage' because bacteria are now the actors, and this is a new film. Devoid of language, barely perceptible, and slowed down by reduced frame rates, their gesticulations

decontextualised and decomposed, Schmelzdahin's anthropic actors fail to signify with gesture or word. Meaning, decoupled from standard touchstones, is relayed to human animals' physical surface, depicted as precariously vulnerable, a leathery coat worn by consumption. A style of exhibition and reception is designed which seeks significance by analysing some actors' weathered, textured flesh. Actors' vulnerable, de- and re-composing bodies are tugged forward, recalibrated as primary vectors of significance. Turned inside out, represented as precariously material, Schmelzdahin's anthropic actors are reframed as meat, their capacity to signify reduced to their body's ability to satisfy others' appetites.

Investigating textural images of eaten people, Schmelzdahin work to synthesise human and more-than-human animal edibility, construing their symmetrical vulnerability by building imagery aimed at evoking unity. Bacteria disavow the acrobatics of anthropic escape.

Furthermore, Schmelzdahin invite viewers to contemplate their edibility in other ways. Film and video, whether analogue or digital, are frequently framed as a surrogate for the anthropic body. For example, Laura Marks's *The Skin of the Film* (2000) examines media able to promote physical sensations alongside cognitive reflection, with cinematic experience construed as an embodied, multisensorial scenario, and certain techniques which approach audiovisual media as a textural surface capable of eliciting physical sensations in their viewership. Similarly, Vivian Sobchack discards standard, disembodied viewing positions to advocate a "cinesthetic subject" (2000), a spectator towards whom a movie is never merely a visual experience but something enjoyed across various regions of the body, the whole sensorium (Ibid.). A visual experience might register in the realm of touch (Garry qtd. in Sobchack), a sound may trigger an olfactory response, etc. "[C]ross-modal sensorial exchange" (Ibid.), Sobchack calls it. Sobchack, analysing Jane Campion's *The Piano*'s (1993) introductory shot where Ada McGrath (Holly Hunter)—hand framed in extreme close-up and captured from Ada's point of view—shines a torch through her fingers back

towards the camera, recalls her own cinesthetic experience, suggesting that her body knew what she was looking at, even before Campion introduced the reverse shot of Ada looking at the light penetrating the skin on her hands. Yet if cinema may return us to our body through imagery that is hard to immediately decipher, could it sensitise one's skin in more non-anthropocentric directions? Instead of promoting a pleasurable feedback loop of self-identification, could filmmakers employ cross-modal sensorial exchange to wound and challenge our ideas of anthropic exceptionalism by recalling viewers to their body-as-meat? Schmelzdahin seemingly say yes. *Stadt in Flammen* comprises an audioscape composed of a person beating their chest whilst droning monotonously, a sonic mat of groans and breaths systematically disturbed by dull, vibratory thuds. Although the sound is hard to identify, it resonates internally, achieving bodily recognition before audible perception. Toying with rudimentary phonetics, this meaty music evades easy assimilation, swooping firstly into one's thorax, initially acquiring recognition through physical memory. Schmelzdahin's music travels along different, bodily junctions and functions, directly addressing our materiality, keying us into embodied viewing and listening experiences from the start. Our corporeality is sensitised whilst human animal bodies are being visibly eaten, and mammals are being really eaten. Schmelzdahin play with cinema's ability to evoke carnal recognition, audibly addressing viewers' bodies whilst framing human animals as meat.

Schmelzdahin pervert; or, rather, literalise Marks's designation of the film strip as a type of sensitive, anthropic flesh, swerving away from a tightly calibrated feedback loop to destabilise—whilst literally feeding bacteria film. With bacteria and cinema, Schmelzdahin excavate a territory of indistinction conjoining human and more-than-human animal. However, an equitable symmetry of human and more-than-human animal remains non-existent. In cinema, more-than-human animals may actually be eaten or otherwise ingested, human animals only symbolically. Today, cinema, analogue or digital, recycled or fresh,

cannot build an even bridge between human and more-than-human animals. Schmelzdahin might invite contemplation of human animals' edibility, but Schmelzdahin's film relies on gelatin, thereby literally taking part in the consumption of more-than-human animals. Yet Schmelzdahin strive to remedy cinema's tendency to ingest creaturely bodies, working with more-than-human agencies to do so. Schmelzdahin's efforts are imperfect, but commendable.

Stadt in Flammen comprises bacteria colonising a medium (analog film) suitable to bacterial growth in collaboration with other microbes. Consequently, it is a biofilm in a traditional (scientific) and cinematic sense. Applying the framework of the biofilm to film helps us connect cinema to the wider rhythms of the world whilst signposting ways in which bacteria can produce moving imagery on their own terms. Microcinematography denies, masters, and identifies. Biofilms welcome, aid, and follow, inviting us to conduct a new bacteriology in non-anthropocentric ways. Through them, bacteria can convey key information about their own ontology. Bacteria disrupt beings' abilities to transcend their earthly contexts. Bacteria ontology comprises reracination, like biofilms. In fact, biofilms may only be made by reracinating media in a triple sense. (1) We must identify those ingredients found within analogue film's body that complement bacterial desires. Subsequently, we must address cinema as a deadly industry, rooted along every axis. (2) We must pare back, go slow, scale down, and resist fast-paced, unsustainable ways of making cinema. Anthropoc artists' schedules and art objects' gestation periods must coincide with bacterial speeds. (3) We must embed media back into those environments from where they were originally derived, exploring cinema's capacity to commune with earthly companions at the site of its extraction.

What other shapes may biofilms take? Jennifer Reeves provides an answer. Reeves composts film. Worried about surplus film produced during earlier work, Reeves refused to waste. In an interview, Reeves explains that she "was feeling guilty about all the garbage I

was producing by making films and it got me thinking... How can I turn that guilt into something productive and not destructive?" (2022; emphasis in original). Reeves's *Landfill 16* (2011) was entombed within compost piles for just under four months. Made with old, analogue media, composed of extraneous clippings, and composted, *Landfill 16* is thrice defunct and twice discarded. Reeves intermittently buried three batches of excess media. Batch one, for a couple months; batch two, a month; batch three, just two weeks underground. In an interview, Reeves tells us that

Bacteria and fungi were collaborators, and destructive ones at that. They nearly wiped out my first batch of buried film, then I learned to extract it more quickly. Emulsion was partly eaten away in my second two batches, to varying degrees. [...] Enzymes and fungi (besides other elements in the soil) did not have the last word. I left what soil clung to the film for the first bit of re-photography, washed the film, re-photographed the film naked, and then finally shot a third pass with some of the same film after painting it frame by frame. You see... Between myself and the soil, there is more action and response, experiment and analysis than a full plan. [...] I pay attention, take notes, learn the elements and forces. I don't have control, so I can still be delighted by the surprise. [...] The best part is when it feels as if I've been given a gift... Some incredible organic pattern when the decay takes on different layers of the emulsion. I then reshoot the footage with lighting to emphasize the uneven points of decay, across that tiny 16mm frame... (2022).

Following bacteria, but also fungi, Reeves acquiesced to others' rhythms. Although partially rejecting mastery, Reeves does not retract her hand completely. This is key. Reeves buries,

steps back, excavates, then ignites an artistic flare, reorganising, doctoring, and appreciating imagery with fresh eyes. Bacterial etching is not a dirty effect to be removed, but a creative process to be embraced. Following exhumation, Reeves rephotographed and hand-painted nearly every frame over five-months, teasing out and developing their idiosyncrasies. Enhancing others' artistic styles, Reeves practises sympoiesis, patiently making old images move anew with bacteria. *Landfill 16* is a multispecies collaboration.

Collaborating across worlds, Reeves exposes waste as not an essential quality but a mobile definition. We *make* waste, by addressing items yet holding value as exhausted or no longer useful. Things never *are* waste, but rather *get* wasted. And what was wasted can become handy again. Waste, as a category, is circular and never settled. "The garbage bin is not the end of the discarded item" (2012: 165), writes Nadia Bozak, "the dump, rather, is an accumulation of resources and potential for reuse" (Ibid.). What's more, making, managing, and jettisoning waste precipitates resounding radiations. Political identities are forged whilst filling up, peeping into, and emptying bins. Bozak argues that not only how we purchase products but how we dispose of them orients us as consumers and subjects, defining our economic and political existence in relation to those who receive the remnants of our effluvia to salvage or simply use, as well as the government, which tells us how and when to dispose of our waste, as well as what is waste in the first place (155). Etymologically, dirt comes from the Old Norse *drit*, to void excrement. In Middle English, *drytt* also means mud or earth. Earth, or muddy soil, is a productive substance for future growth, as is faecal excrement, although we call productive excrement 'manure', and, generally speaking, only more-than-human animals' faeces can be regarded as manure, despite the phenomenon of humanure, formerly known as 'night soil' (named as such because it was only to be collected at night, in secret and out of sight), which has been used worldwide for millennia as a valuable fertiliser. As Patricia Buckley Ebrey and Anne Walthall (2013) explain, in 9th

century Japan, for example, the trade of human excrement was accepted. Land owners housing wealthy residents would sell their faeces to farmers for a higher price, given such residents' higher quality diets. Male residents' faeces commanded inflated prices over their female counterparts, with samurais' effluvia the most coveted ordure of all (Ebrey & Walthall 294). Nevertheless, in the west, anthropic excrement is construed as a negative substance, exhausted of beneficial materials. This dual identity of dirt, comprising liveliness and deathliness, speaks, too, to waste's tangled ontology. As identified by Hertz and Parikka, even after being ejected as exhausted matter, waste yet lives on, capable of indefinite pollution. Consequently, we can approach waste as a conceptual category, not a material reality.

And have no doubt, cinema gets absolutely wasted. Old media, plastic casings and metal cans, antiquated technology, unsuccessful or otherwise no-longer-loved movies chucked into bargain bins or actual dumps. Cinema makes trash, and lots of it. Designed to become obsolete and yet made of robust materials designed to endure (Bozak 158), cinematic media, just like most other contemporary products, are beholden to the key contradiction at the centre of the globe's waste management crisis: products designed to become obsolete, yet made of materials designed to last indefinitely (Ibid.). Even digital imagery relies on actual frameworks that destroy the earth. Purportedly ephemeral, data is always embodied, manifest in databanks sequestered "somewhere up north, preferably on the permafrost" (Parikka 2015: 25), the ozone depleting, ice cap melting wellsprings of digital clouds. And after life, data refuses to die. Bozak describes the ways in which our outdated or otherwise electronics are sent off to countries who salvage their precious components in order to sell such elements back to the technology industry. Yet what is not recovered is discarded, leaking toxins into increasingly polluted water tables, or burned, becoming clouds of micro-plastics and metals cascading across the sky, and into human and more-than-human lungs (156). Analogue film

is no better. In an interview, Doing tells us that “the toxic aspects of analogue film are [so] eas[y] to see: chemicals, silver, plastics, water usage” (2022). Neither analogue nor digital media evade questions of violence. Networked by gelatin, stretched across plastic, squeezed through actual machinery, analogue film, bound to myriad industries, will survive underground maybe for millennia, its volatile body forever shifting, never fully retiring. Any analogue film will remain unfinished. Becoming-biofilm to outlive its anthropic user with all the disquieting energy of the zombified undead, analogue film will always be producing new imagery, albeit from some subterranean territory, secretly being screened underground.

Working with bacteria, Reeves bends waste’s unidirectional flow, resurrecting something dead to carve a rupture. Yet if *Landfill 16* returned unaltered, it would say nothing of waste’s adventures. Fortunately, bacteria can reanimate film, even after its discard. Reeves’s work comes back decisively changed, signalling waste’s conceptual instability besides bacterial creativity. A geological plateau dappled with a microscopic hammer or a lapidary stratum suffused by myriad colours, what Reeves’s film was is indiscernible [Fig. 7, 8]. Now, Reeves’s film is a perpetually shifting mosaic of unpredictable imagery, like old, sundried paint finally flaking, a dense canopy visualised through a refracting kaleidoscope. Achingly beautiful but startlingly scarred, *Landfill 16* confronts viewers with swathes of vibrant, bewitching detritus, showcasing the lively afterlife of cinema’s trashed components. Displaying cinema’s tendency to get wasted besides its ability to indefinitely survive, *Landfill 16* illuminates film’s use of gelatin alongside its resolutely resilient and shockingly toxic body.

Now, old film becomes-biofilm and starts to never stop moving. Indeed, the biofilm lacks a still image. Rather, it is a singular moving image like, as I will propose in chapter 5, a mushroom spore print. Reanimating film’s discarded body, bacteria tacitly bind cinema to the various industries fueling its construction, and rendering earthly life vulnerable. Bacteria

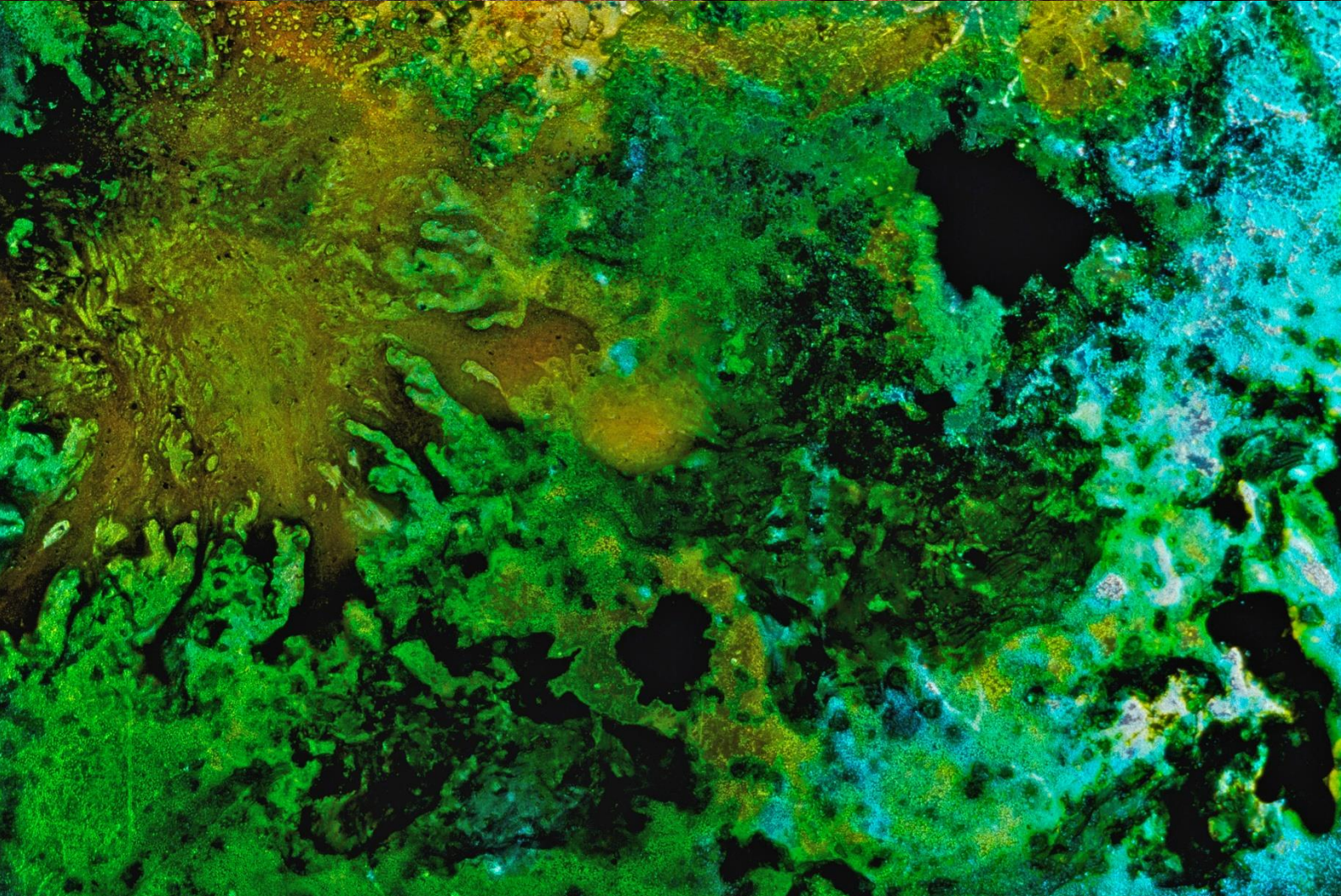
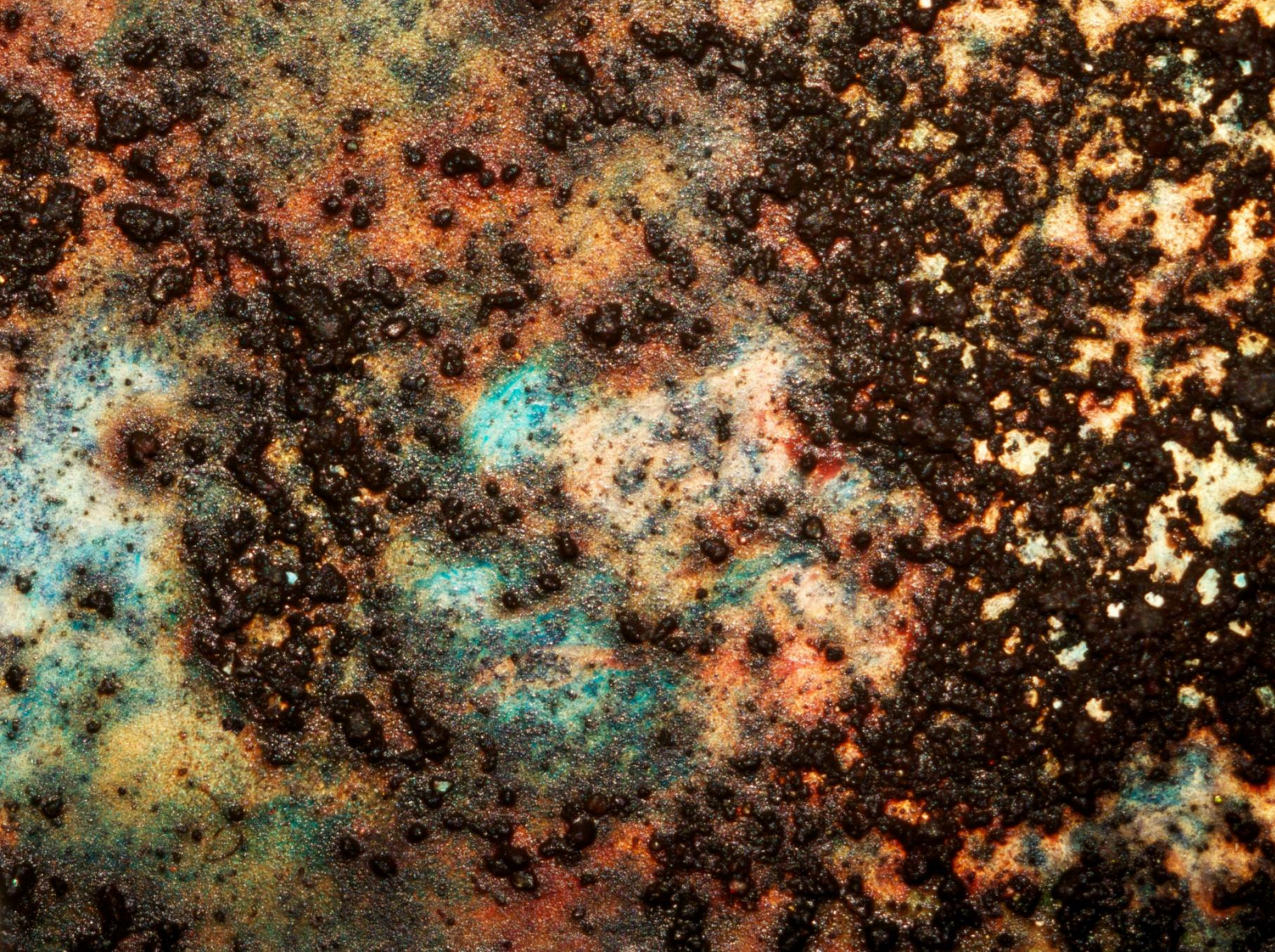
block cinema's ability to sequester its effluvia. Appropriating and redirecting the Stygian torrents of western waste, Reeves invites us to witness how wasted media remains lively, staying behind to wreak environmental damage even whilst dead. Reeves combats fetishistic interpretations of analogue film as somehow less deadly or more ecologically wholesome. Analogue film survives because it is made of plastic and metal most likely harvested from and produced within socially and environmentally unacceptable scenarios. It remains volatile and amenable to reanimation because it is composed of more-than-human animal bodies. Zombie media, *Landfill 16* depunctualizes, refuting analogue film's ability to evade accountability.

Cinema absorbs various ingredients extracted from ecologically fraught situations, excreting at alarming rates. Much of cinema's dirty business occurs beyond the screen or auditorium, during its production and within the orbital periphery and outlying extractive frontiers of its planetary enterprise. Generally, moving images dodge liability on account of their ontology. For what do mines or minerals, pick axes or proxy wars, have to do with ephemeral, bodiless images? Data floats in a cloud, and even analogue imagery arrives riding beams of light, shot out from a small booth often obscured from view. To reracinate cinema is to refute its slippery tendency to evade its relationship to abuse, to shine a light on violence and investigate every work with a fine-toothed comb.

Doing also contends that "One of the core aspects is to consider the real costs of cinema just like we should consider the real costs of a plastic bag" (2022). Cinema requires all sorts of energies, resources, and violences: planes, trains, and automobiles; plastic booms, metal jibs, and miles of dolly tracks; bodies on set, behind desks, and fed to crew at lunch; a tangled, almost unnavigable tributary of monetary flows; mines worked by children in the Democratic Republic of Congo in pursuit of coltan, a key ingredient in the capacitors of computers and electronics capable of editing, orchestrating mass liaisons, and writing these

words. I am also accountable. Drowning in technology, I do not escape the challenge to reracinate. Mobile phones, another key component of not only daily life but cinema's infrastructure, comprising shards of glinting 'blood' diamonds otherwise refused for their connection to regional wars and regimes of local and planetary terror. The toxic vapours seeping out from heaps of discarded technology to infect the nervous systems of workers in Ghana or Pakistan. Not only slaughterhouses or plastic factories, but mines make images move, and unending streams of waste keep them moving. Plugged into and supportive of deleterious practices, cinema advances planetary annihilation. Cinema is fed by, and reciprocally feeds, the engines driving the climate crisis.

Cinema renders more-than-human animal existence precarious because it eats more-than-human creatures and eradicates, as Anna Tsing might call them, "livable landscapes" (2017: 51). *Landfill 16* addresses cinema's propensity to escalate, and abusively co-opt, more-than-human animals' mortality. Reeves works through such conundrums methodologically, inviting bacteria to reanimate wasted film, foregrounding analogue film's employment of gelatin. Reeves operates audibly and visibly, too, binding media and machines, extractive industries and moving images. *Landfill 16*'s layered audioscape is mainly composed of vocalisations made by distressed more-than-human animals and chugging thrums industrial machinery make whilst tearing up the earth. Reeves tethers centre and periphery, audibly denying cinema's slippery ability to wash away its ties to deadly operations guaranteeing ongoing extinctions.



On previous page: Fig. 7, 8. Reeves, *Landfill 16*.
Images courtesy the artist.

More-than-human animals sometimes appear. A ground hog jutting its head out from a burrow; a forest fire briefly; a moose; some insects feeding their young; a bird that falls from the sky like it was shot; a deceased deer by a road. [Fig. 9] These views are fleeting and fragile. Ingested, chewed up, and disappeared by a relentless flow of imagery, they are swiftly moved beyond. More-than-human animals puncture, yet never stop, *Landfill 16*. Nevertheless, a dead deer is there at its very end, visible within a vertical lesion, bisecting the already compromised image. Beneath cinema's usually stable surface, at the terminus of its sprawling systems, lay deceased more-than-human creatures, eaten by the medium or left to die after being stripped of an environment.

Reeves's work sustains such violences. Disseminated online and in person, and made on film, *Landfill 16* does not evade responsibility. However, Reeves accepts, and works through, her own accountability, owning up to nullify and move beyond. Working through cinema's seemingly unavoidable tendency to discard, Reeves mindfully makes work whilst making to a maximally reduced degree. *Landfill 16*, to play with Bozak's words, is the result of a filmmaker climbing into, owning, and striving to dissipate but never ignore their own footprint. Facing violences and wounding guilt to derail future damage, Reeves, refusing to turn away, peered into and grappled with cinema's dark side (the side that retreats, physically and metaphorically, when the film strip is exposed to light), opting to make different media differently. Grasping cinema's impossibility to not do harm, Reeves went slow, reracinated, and made something new without needing to get many new things made. Stepping backwards, Reeves takes bold steps forwards.

Landfill 16 is a biofilm. Bacteria, cultivating a cosmic gaze, pull one's view inwards and outwards in every direction simultaneously, towards relationships so readily avoided. Like bacteria, biofilms tug one's attention into seemingly unrelated territories. Biofilms are often about responsibility to others' worlds. Biofilms show that bacterial agency is not some rarefied, rudimentary event, but a contemporaneously vibrant and creative phenomenon. Biofilms position Haeckel's hierarchical chain of being alongside cinema's supply chains: convoluted, seemingly without end, entangled, and devilishly messy. Biofilms will always feature more than bacteria. Fungal beings, worms sifting through soil, plants employing phytochemistry: all key players vis-à-vis biofilms' production. Biofilms might draw in on bacteria, but bacteria never produce in a vacuum. Biofilms are always sympoietic adventures, playgrounds for a provisional infinity of parties, media of myriad agencies.

Furthermore, though human animals can collaborate in their making, biofilms need not include human animals to a significant degree, if at all. To exemplify this, we can explore Emmanuel Lefrant's *Underground* (2001). *Underground* shows coloured clouds feverishly coalescing and dispersing beneath an obsidian sky. Visceral crimson, frosty ultramarine, fiery orange, deep greens of an ancient woodland: plumes of smoke shot through by a plenitude of colours boil within the frame. Around the millennium, Lefrant was traveling for work. Appropriating the negativity of global travel, Lefrant buried film across the earth, specifically, as he says, "in the United Kingdom where it often rains and where the soil is most of the time very muddy; in Canada during winter where the soil is frozen; and in Africa (Togo) where obviously the soil is much dryer" (2022, interview with author).

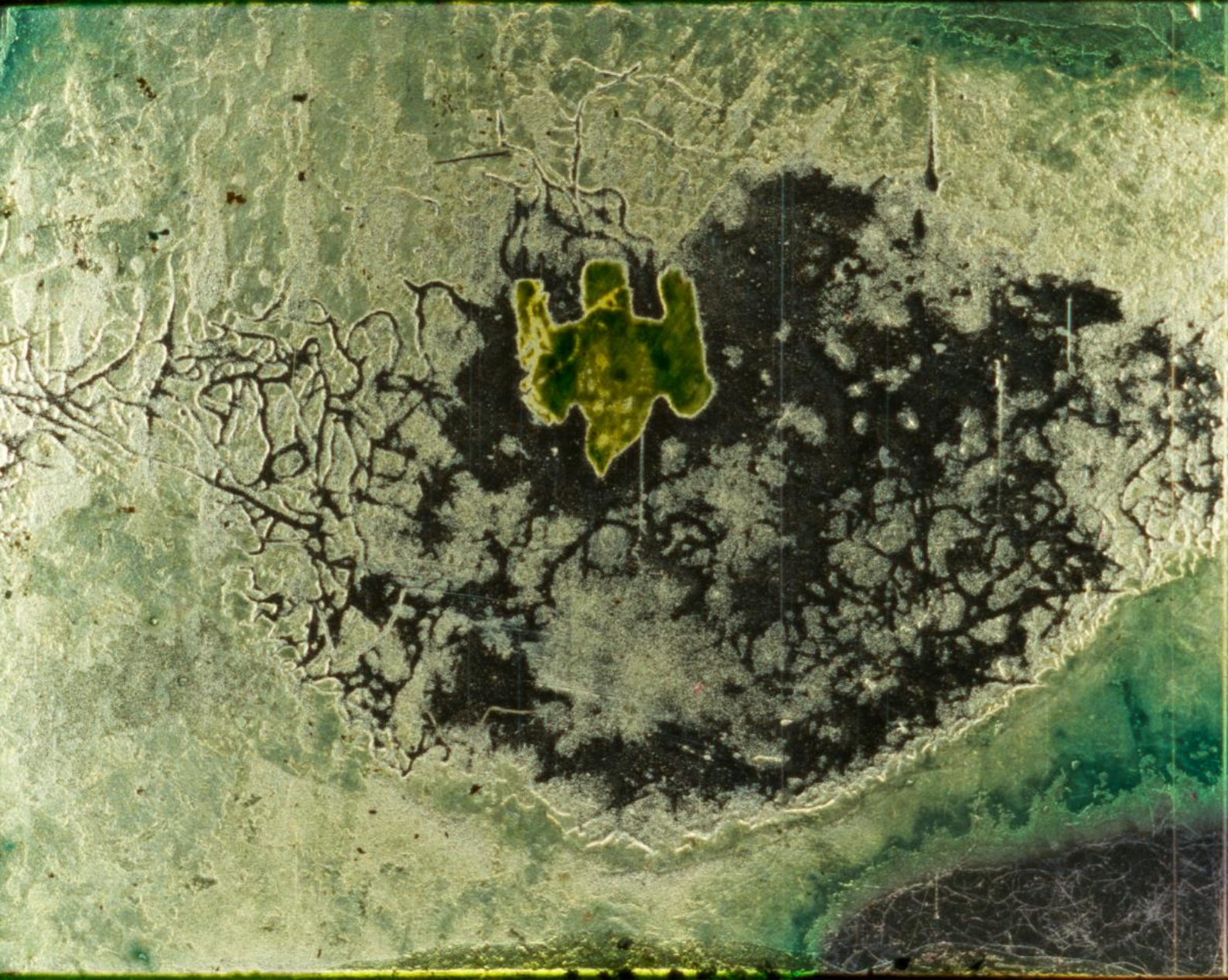


Fig. 9. Reeves, *Landfill 16*.

Image courtesy the artist.

Lefrant explains that his goal was “To investigate and conduct experiments into how different film stocks would react to different bacterial environments” (Ibid.). Burying film for anywhere between 2 months to 1 year, Lefrant examines how two “living elements”—“film and the chemicals on it and [...] soil and all the bacteria it contains”—might “interact with each other” (Ibid.). Lefrant analyses film’s urge to become-biofilm besides bacteria’s ability to produce cinematic art by processing the earthly ingredients stitched into analogue film. Lefrant collaborates with bacteria in two main ways. First, Lefrant doctors the stock. Second,

Lefrant buries and exhumes, offering bacteria a substrate on which to pullulate. Lefrant's strip is unexposed, but processed; blank, yet primed.

Lefrant, in 'On the Materiality of Film' (2019), says that

This black 'primer' [is] a space that makes everything possible, a space of absolute potentiality and virtuality. [...] A solid black film is the complete saturation of all possible colors or images [...]. It is therefore not a question of covering a blank slate with colors or images; these already exist although they are masked. To bring out the image again, the artist extracts matter from the medium, rather than adding it, like the sculptor hewing from a block of marble (33).

But the agent needn't be anthropic. In an interview, Lefrant explains how

A positive film emulsion is sensitized in such a way that, if the film is chemically developed without being exposed to light, the result is a pure black. This black primer became a "blank" surface from which I needed to extract matter from in order to bring out an image. I say "I" but nature did the work. I just facilitated it here (2022).

By 'extracting matter', Lefrant addresses the geological and chemical ingredients resident in photochemical film's gelatin-based emulsion. By extracting them, Lefrant brings them from latency, to visibility. Lefrant also provides signposts pointing back to the connections I introduced between bacterial digestion, ecological catastrophe, and industries of corporeal and geological extraction. Extracting matter, Lefrant practices strip mining.

Lefrant offers bacteria an abundant but blank canvas ripe for creative development. Lefrant's exercise is a forward momentum towards self-effacement. Lefrant works and withdraws, offering bacteria control over imagery infused with a dormant energy. *Underground* approaches, though does not fully attain, an elusive stratum of cinema practice towards which every biofilm is angled: film production in human animals' absence, per bacterial abilities to kickstart film's becoming-biofilm. Previously, we saw bacteria impact extant work. Now, one sees fresh imagery, partly, if not entirely, made by bacteria. Bacteria do not simply derail, destroy, or respond to our systems or views, says Lefrant. Bacteria may also work in our absence, producing novel art from a blank page. Bacteria may ally with us. They may thrive without us, too. This is a humbling realisation, indicating human animals' non-exceptionality.

Lefrant brings me full circle, for Lefrant, too, rejects standard ways of visualising bacteria. Returning to physical film, Lefrant seeks out alternate lines of sight. Lefrant explains how

Contrary to scientific cinematography from the beginning of the century, the micro-organisms are not re-created (by being filmed) but rather reproduced directly on the film [...] and made to move on screen by the driving mechanism of the projector. Paradoxically, the point is to reach the extreme of realistic representation by way of an abstract image, by actually showing the micro-organisms with no other mediator than the lens of the projector (2019: 34).

We can reflect on Lefrant's comments by noting how Lefrant advances a recalibrated realism, taking more-than-human lifeworlds seriously through cinema. Strip mining to evade the

microscopist's glaring eye, bacteria gnaw at the hegemony of the anthropomorphic gaze, which sees the world, exclusively, from human animals' perspective, and coincidentally erases the legitimacy of every other viewpoint.

However, Lefrant's work, like other biofilms, may never be able to entirely eschew violence. As Lefrant says, bacteria were frozen on the film strip. Perhaps bacteria stored on the film might well have been murdered during their journeys following exhumation. Dug up, bathed in chemicals, handled frequently, seared by the projector's lamp, and stored indefinitely, bacteria, even in biofilms, will be subjected to a range of circumstances perhaps curtailing their capacities to flourish or even live. Bacteria are resilient, not invincible, and biofilms might be antibiotic. Maybe the only way to nullify abuse is to intern, delete from memory the coordinates of burial, and squash the urge to excavate. But if film is forever buried, it will bleed poisons into the earth, surviving indefinitely atop its synthetic, plastic skeleton. Even with biofilms, satisfying answers remain evasive. Biofilms are excellent devices for comprehending bacterial agency and works in the right direction. Yet they are not perfect.

Luckily, a more sustainable alternative already exists. Before, beyond, and, undoubtedly, after cinema, bacteria already are, maybe always will be, busy making actual biofilms daily, forming relatively gargantuan colonies beneath the surfaces of ponds and against foodstuffs, and suspended across human animals' gastrointestinal maze, the entirety of the epidermis, the mouth, throat, anus, eyes, and, truly, everywhere else. The glistening, pink infrastructure of our gastrointestinal tract becomes, with bacteria, an embodied auditoria, a corporeal context for biofilms' production and exhibition, the internal correlate of Dürer's syphilitic mercenary, whose weeping, inside-out flesh scans, in some register, as a surface conducive to biofilms' public enjoyment. Body as multiplex, screens everywhere; or, rather, one perpetually writhing screen without border or distinction, body-inside-out and world-

outside-in: biofilms as cinematic media. These screening events are underway from the moment of our conception until long after our death, as our body, whether active aboveground or buried, can be regarded as material for bacterial creativity, regeneration, and growth. In 'A holobiont birth narrative' (2013), Gilbert explains that, in the womb, the infant's anus and mouth are held open, and bacteria rich liquid, courtesy of the maternal microbiome, fills up and infests the dormant child. Later, as the child rushes screaming down the mother's birth canal, additional liquid gushes into the child's still open mouth, and their infantile microbiome enters a further stage of complexity and development. This is again supplemented as the infant suckles, for the mother's milk and nipple contain a unique microbial portfolio, tailored to the child's biological needs (Gilbert 2013: 3). Before we can even view visual media (as our eyes, in contrast to our anus, are shut closed inside our mother's stomach until the third trimester) biofilms are being screened inside our bodies, along the slippery highway tethering the upper and lower orifices of our alimentary canal. The infant's first excretions contain the evidence of this early colonisation-cum-screening event, in the form of distinctive microbial communities flourishing within our seminal effluvia (Ibid.). Bacteria co-build worlds by building actual biofilms, themselves types of visual media. Stretched across surfaces and never not moving, biofilms are films in their own right. We can approach biofilms as movies running without machineries' aid, and often in the dark. An almost four billion year old proto-cinematic device which contemporaneously survives, regularly overriding extant media. The biofilms I analyse are a young, rarefied subset of an ancient portfolio of films made by bacteria, and other microorganisms. Synthesising bacteria and cinema is deceptively straightforward. Analogue film harmonises with bacteria ontology. Additionally, bacteria have been producing moving imagery since the start of bacteriological time, in, and on, our bodies. Moving beyond microcinematography simply requires going, and stepping, back.

But if bacteria make their own visual media, why make biofilms? Biofilms have helped me explore cinema's thematic and physical viability in the face of accelerating climate crisis. The media I have analysed also typify key facets of a conceptually and materially sustainable film practice, which I express in chapter 6 as cineremediation. For example, ecological catastrophe is a nightmare of excess production, consumption, and waste. Thus artistic sustainability requires refuting obsolescence by creatively recycling or, as Parikka and Hertz say, depunctualizing: breaking media down into components before repurposing constituent elements towards novel ends. Reeves and Schmelzdahin show how this is done. Making new media on recycled and purportedly exhausted stock, both display waste's fecundity whilst attempting to decouple from extractivist regimes and industries of production. Still, they rely on slaughter economies, employing gelatin. Yet, depunctualizing, both exhume this invisible ingredient, rerouting energies towards critiquing the anthropocentric industries and ideologies that render more-than-human beings supplemental to human animals' satisfactions. Unlocking the formerly incarcerated power of the butchered and oppressed more-than-human body, they illuminate cinematic culpability and advance liberations.

Additionally, all three films, produced over years, embody commitments to attune cinema to microbial rhythms, exhibiting reticent methodologies of restricted means and decelerated speeds subordinated to others' tempos. Attunement necessitates locating a canvas amenable to others' writerly styles. As bacterial and anthropic styles of perception and expression are so different, we require media capable of facilitating multispecies communication. Enriched by gelatin and exposed to the spontaneity of earthly encounters, physical film is decisively suitable to bacterial semiosis, a material technology of revelatory encounter. In these films, anthropic mastery is withheld in respect of sovereign others who are welcomed as co-creators with exciting talents to contribute. Bacteria are not simply gazed

at but addressed as beings with unique viewpoints that human animals can acknowledge, if not entirely comprehend. Biofilms speak not of capture but empowerment, of captivation with bacterial abilities to exhibit their subjectivities through art.

Yet numerous counter-arguments exist. Some have been addressed already, but a primary issue remains unexplored. For if cinema needs consumption, then arguing for its ongoing validity in any instance involves contending that some consumption is permissible. This is dangerously swampy territory, for such thinking might replicate anthropocentric value systems and binaries: *X* is wholly or partly reducible to food, but never *Y*. Furthermore, at what point do we attain an unacceptable ‘too much’? It is unclear if the microorganisms conducive to biofilms can survive archival conditions or projection’s vicissitudes, its searing heat and glaring light. Additionally, bacteria, I imagine but do not know, do not care about participating with us in co-producing cinematic art on analog film. Furthermore, how can we even speak of bacteria as artists, given their likely lack of interest in making visual art? To a bacterium, a biofilm might not be a work of art, but rather a home or a communal enterprise. Consequently, perhaps biofilms do not introduce us to the concept of bacterium-as-artist, but conversely bacteria-as-agent. Biofilms, I believe, speak firstly to our benefit, and only latterly to bacteria’s, by re-orienting our perceptions of, and relationships with, bacteria towards less violent interactions.

Nevertheless, we must ask: if cinema must eat to live, whether more-than-human bodies or geological materials in the form of technological equipment, how can its continuation be justified? This is a problem of heterotrophy, faced, too, by cinema. Human animals, of course, might entirely abstain from eating, undertaking religious or political fasts or executing starvation as art: the domain of hunger artists. Paradoxically, ethical living manifests perhaps most pertinently in total refusals to eat, coinciding with untimely death. Living ethically whilst still consuming thereby orbits a fallacy that must be continually and

openly navigated if one hopes to honour others at all. Biofilms are not serene alternatives to more dominant and deadly expressions. Conversely, they are gestures towards the viability of less destructive modalities of making. Biofilms show that anthropic artists can extract and yet give back, expanding cinema by welcoming more-than-human beings' creative powers. Experimental testing grounds of more sustainable ways of thinking about, and producing, cinematic art, biofilms remain mere steps in positive directions.

Consequently, I propose that perfection, in any context, is a mobile horizon forever grasped towards, never fully acquired. There is no pristine denouement, only constant calibration. Like eating, ethical filming requires navigating many violent options, continually withdrawing towards a retreating limit at which consumption or making can more peaceably occur. In this scenario, prevailing deficiencies are not paralyzing conundrums but valuable nodes for further development. Biofilms are not termini but part of a journey towards cinematic justifiability. Film practice becomes increasingly but never entirely justifiable when anthropic filmmakers work along restorative axes, groping towards pervasive perfection. Ethical filming is a process, never a surety.

Ecological catastrophe is significantly a crisis of blindness, marked by a failure to acknowledge more-than-human beings as valuable beyond human animals' desires. Confusingly, such blindness regularly operates through sight, for looking can render others' agencies invisible or subordinate, by instructing us to become blind to other beings' sovereignty or personhood. Bacteria are not only crucial to earthbound ecologies and earthly life, they are themselves recalcitrant subjects. Ignoring bacterial subjectivity, human animals enact radical injustice whilst curtailing their own survival, as we have never not relied on bacteria to live. Acknowledging bacterial subjectivity is, today, an existential and ethical urgency, besides a chance to reconfigure anthropic identity as neither self-same nor essential but rather polluted and mercurial. Now, cinema assumes extreme value, a literal medium: a

bridge between worlds. Long utilised as an apparatus of bacterial subjugation, cinema yet offers routes to bacterial self-empowerment. Biofilms signal new regimes of human animal-bacterial relations besides the viability of a restorative cinema geared towards ecological remediation.

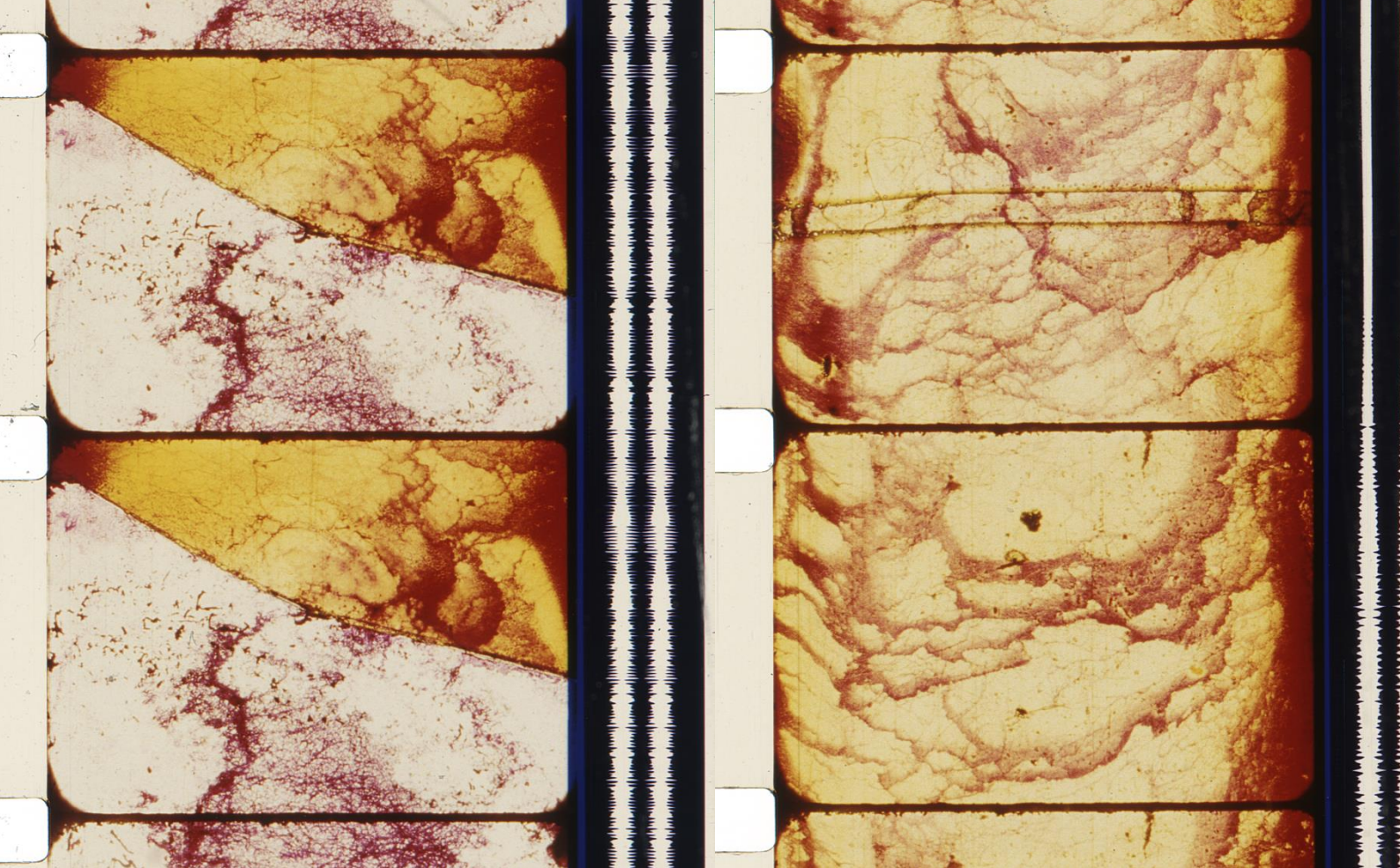


Fig. 10, 11. Emmanuel Lefrant, *Underground*.
Images courtesy the artist.

Looking at these images, recalling clouds of roiling smoke, we must remember that, prior to microbial intervention, they were black. Bacteria, collaborating with fungi and other microbial beings, teased from these latent contexts a novel suite of images and forms. These images, given Lefrant's extreme self-effacement, introduce us to the possibility of encountering bacteria beyond negative frameworks of parasitism and decay.

MUNDUS INVISIBILIS

CINEMA AND THE TRANSFORMATION OF THE EARTH

In 1674, Antoni van Leeuwenhoek (1632-1723), a draper from Delft, saw a biofilm. Gazing into the “very marshy, or boggy” volumes of a little inland lake, known as the Berkelse Mere (Leeuwenhoek qtd. in Dobell 1932: 109), Leeuwenhoek noted an incongruity. In winter, the Berkelse Mere was clear. Amidst midsummer, it exhibited “little green clouds floating through it” (Ibid.). Peering into the Berkelse Mere’s fluid screen at some moving, cloudy imagery, Leeuwenhoek was perplexed and inspired. Leeuwenhoek grabbed a phial, scooped up some liquid, and brought it to his shop, which happened to house some of the seventeenth century’s most powerful microscopes, though these were reserved for analysing cloth fibres. Leeuwenhoek remarks that

Passing just lately over this lake, at a time when the wind blew pretty hard, [...] I took up a little of it in a glass phial; and examining this water next day I found floating therein divers [*sic*] earthy particles, and some green streaks, spirally wound

serpentwise, and orderly arranged, after the manner of the copper or tin worms, which distillers use to cool their liquors (Ibid.).

However, besides these tiny, coiled beings, there squirmed tinier things still.

Among these there were [...] very many little *animalcules*, whereof some were roundish, while others, a bit bigger, consisted of an oval. [...] And the motion of most of these *animalcules* in the water was so swift, and so various, upwards, downwards, and roundabout, that 'twas wonderful to see: and I judge that some of these little creatures were above a thousand times smaller than the smallest ones I have ever yet seen, upon the rind of cheese, in wheaten flour, mould, and the like (110-111; emphasis added).

Remember Varro's animalculae. After nearly two millennia, bacteria still registered as tiny animals. Leeuwenhoek's worldview could only accommodate plants and animals. Mobile, animal. Stationary, plant. Most likely, Leeuwenhoek's tiny animals were "*Arthrospira* or *Spirulina*" (Dobell 110; emphasis in original), possibly "*Euglena viridis*" (111; emphasis in original): all green algae (110). Though bacteria were at Berkelse Mere, Leeuwenhoek missed them. Nevertheless, one year later, Leeuwenhoek, after catching some rain tumbling from his guttering, saw bacteria. They yet remained, to Leeuwenhoek, animals. Although many things squiggled and wriggled within Leeuwenhoek's bucket, the fourth type fascinated him the most.

The fourth sort of little animals were incredibly small; nay, so small, in my sight, that I judged that even if 100 of these very wee animals lay stretched out one against another, they could not reach to the length of a grain of coarse sand; and if this be true, then ten hundred thousand of these living creatures could scarce equal the bulk of a coarse sand-grain (qtd. in Dobell 133).

Over the next few years, Leeuwenhoek sought further views in many curious places. A vinegar solution; some pepper infused water; and “spittle from the mouths of two different womanfolk” (Leeuwenhoek qtd. in Dobell 239), “a child about eight years old”, and an “old chap [who] hadn’t a back tooth in his head” (Ibid.). Eventually Leeuwenhoek opened his mouth and peeped inside himself, rifling through that “little white matter” which “sticketh or groweth between” one’s grinders, and “which is as thick as if ‘twere batter” (Ibid.).

On examining this, I judged [...] that there yet were living animalcules therein. I have therefore mixed it, at divers times, with clean rain-water (in which there were no animalcules) [...]: and then I most always saw, with great wonder, that in the said matter there were many very little living animalcules, very prettily a-moving (Ibid.).

Many were disgusted at Leeuwenhoek’s findings. The idea that we share our bodies with benign, more-than-human companions was, as it is today, unbearable. Leeuwenhoek evades such prejudices, proudly swimming in sympoiesis, asking

[W]hat if one should tell such people in future that there are more animals living in the scum on the teeth in a man's mouth, that there are men in a whole kingdom? [...]
 For my part I judge, from myself [...], that all the people living in our United Netherlands are not as many as the living animals that I carry in my own mouth this very day (Ibid.).

Leeuwenhoek's journey from Berkelse Mere to his own internality is typical of two tendencies people undergo when confronting bacteria. First, to always follow bacteria back to oneself, for bacteria issue scuttling rejoinders to key, anthropocentric concepts: essentiality, unitary subjectivity, .etc. Bacteria will promote radical self-reflection, and, properly followed, supplant anthropocentric ideals of tidy, self-same individuality. Second, to not appreciate the views offered. Leeuwenhoek, after watching a biofilm play out beneath Berkelse Mere's surface, had to see it differently, to make it abide by anthropic scales. Unable to accept its mysterious beauty, Leeuwenhoek needed to know exactly. Scooping up, deracinating, transplanting, asymmetrically gazing, and, presumably, later discarding, Leeuwenhoek established precedents for viewing bacteria. Top-down, never on their own terms.

I time-travel back to Berkelse Mere, to a moment when two ways of visualising bacteria vied for supremacy by a lake in rural Holland. Multiple styles of looking prevailed then, alternate pathways I think it timely to reinvigorate. Refusing microscopy and microcinematography, I propose biofilms as ways through which bacteria may represent their artistic and pedagogical abundancies in registers legible to human animals, and perhaps most importantly, without anthropogenic media's intervention. Synchronising biofilms and cinema—thinking bacteria in, on, and through analogue film—I advance biofilms as

signifying the possibility of a new synthesis of bacteriology and cinema capable of advancing non-anthropocentric understandings of bacteria, cinema, human animals, and the earth.

There is a tension in my critique of Leeuwenhoek and microscopy. If Leeuwenhoek never adopted microscopy, instead believing, as the people local to Berkelse Mere apparently did, that the emerald clouds were caused by dew, then bacteria may yet remain hidden from our knowledge, and biofilms would be quirky, as-of-yet indecipherable phenomena. Additionally, contemporary bacteriology employs microscopy and microcinematography. Without such practices, bacteria's materially and conceptually amazing and transformative behaviours would surely evade us. It is unclear as to how, or whether, this knot can be navigated. Nonetheless, I contend that microcinematography is out of sync with new views and that other, more non-anthropocentric ways of visualising bacteria are necessary, and extant. To witness biofilms, we need only step back, refusing to block analogue film's innate desire to become-biofilm. Biofilms are antidotal, rewarding patience, openness, and respectful attention. Biofilms evade the mastering grasp, and glaring eye. To borrow Pick's concept, film only becomes biofilm when one lets film, and bacteria, be.

Amidst seemingly unstoppable climate crisis, cinema must fundamentally alter its ways of operating besides the style of its output. Cinema, as remarked in chapter 3, must begin becoming-plant. Becoming-plant names cinema's potential coincidence with plant ontology. Becoming-plant requires materially and thematically attuning to planthood; or: filming like a plant. An interrelated requirement is the production of different media differently. What is this statement conveying? Simply: to sustainably make moving images that encourage more sustainable ways of being. Much of cinema visually promotes an ideology of human exceptionalism and, subsequently, anthropocentrism. Generally, the apparatus thoroughly aligns with a human animal viewpoint, tacitly signifying that human animals' reality is the only reality. Moreover, narratives perennially produce tales relevant

only to human animals, relegating every other story to the background, casting the world as an instrumental prop. And cinema, ingesting real materials, really devours the world. To devour the earth is to not only actually imbibe it, but to construe it as an instrument, twisting the world until its greatest value coincides with its ability to serve others' purposes, satisfy others' appetites. Cinema, often doing precisely this, does its damage in at least two ways: industrially, and ideologically.

Biofilms result from a refusal to make art by devouring the world. My understanding of the word devour, especially in cinema's context, stems from Pick's discussion of cinema and devouring in 'Vegan Cinema', where looking and eating are intertwined to advance novel discussions. Another word for a 'non-devouring cinema', as proposed in Pick's 'Nothing now but kestrel' article (2017), is the 'cinema of letting be'. Biofilms typify different economies and philosophies of moving image production, radically scaled down and excitingly non-anthropocentric. Biofilms aid bacteria, besides many other more-than-human beings, to convey their subjectivity. Biofilms become a possibility only when filmmakers acquiesce to others' rhythms, which never perfectly coincide with ours. Normally, making movies requires mobilising a vast, seemingly unending battery of institutions, and excreting wide channels of toxic, nearly immortal waste. Biofilms require a different type of practice altogether, one that works rhizomatically, plugging into others' worlds to precipitate mutual flourishing, finding sustenance by forging multispecies allegiances. Biofilms are sympoietic monuments, works of making-with, exemplary of multispecies becomings. When one makes biofilms, one films, too, like a plant. Echoing bacterial and vegetal entanglements, cinema's becoming-plant is tightly coiled up with film's becoming-biofilm, which itself signals like a flowering plant—its roots surrounded by microbial companions in the soilscape of the rhizosphere—ready to unfurl.

Bacteria everywhere enable, disrupt, exceed, and envelope our designs. They have been doing so since the beginning of bacteriological time. Bacteria slice through human exceptionalism, signalling how earthly flourishing has never not been a co-constitutive affair. Leading by example, bacteria teach the necessity of making-with, of living with(in) other worlds and deriving one's own strength from enhancing others' flourishing. Following bacteria operates as a task opening onto the discovery of far more sustainable cinematic and earthbound futures. Moving forward into the flipped out and yet extant ecologies of the future, appreciating bacterial subjectivity becomes one of our key tasks. Biofilms let us do this in perhaps unprecedented ways. Appreciating bacteria in ways both ancient and new, biofilms offer cinema a chance to help transform and preserve the earth.



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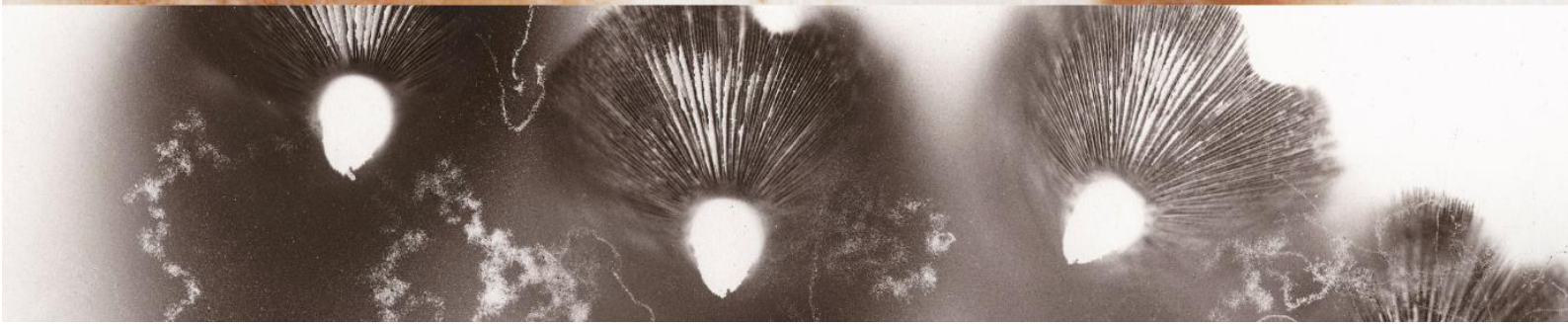
MUSHROOMS



AT THE END



OF CINEMA



§ 5

There,

so an ancient legend said,

men grew from rainswept fungus.

(Ovid, b. VII, 392-393)

Fungi are a living confusion, more animal than plant. Fungi are animals' closest living relative. Approximately 465 million year ago, we shared a common ancestry. We share nearly 30% of our genes. Paul Stamets explains how the branch of fungi that evolved into animals captured nutrients by enveloping food with cellular sacs, basically rudimentary stomachs. Emerging from aquatic habitats, they devised techniques to prevent moisture loss, like skin comprising layers of cells which also provided bulwarks against infection. Advancing different strategies, fungi's other branch maintained a weblike anatomy of entangled cellular chains and scurried underground, forming a network (mycelia) on which life still flourishes (Stamets 2005: 3).

Fungi generally operate out of sight and below our vision's threshold, bursting into view as mushrooms. Mushrooms are fruiting bodies, but not all fungi produce them. Sporification constitutes many mushrooms' method of reproduction. During sporification, billions of spores shower outwards from unfurled caps, travelling on the wind. Landing on appropriate media, like soil or gelatin, spores can produce hyphae. Hyphae are wispy tentacles designed for foraging, each, Merlin Sheldrake explains, just one cell thick, more than 5 times thinner than a human animals' hair (2020: 57). Hyphae are the primary means of fungal locomotion and consumption. The more hyphae touch, and they further they spread, the more the fungal mass can consume (Ibid.) Hyphae entangle to form the fungal anatomy, the mycelium, "a living, growing, opportunistic investigation—speculation in bodily form" (Ibid.). Nicholas P. Money explains that is only when such fungi have acquired an adequate store of foodstuffs, and the fungal body has achieved a required mass, can fungi pierce the fragile boundary separated below- and above-ground (2002: 4). If spores are analogous to plants' seeds, mushrooms are kin to flowers, Sheldrake says, and although mushrooms are what people imagine when they think of fungi, mushrooms are only 1 part of a much larger structure. Mushrooms are simply the fruiting bodies of fungi, a fungal strategy to produce and

disseminate spores. Mushrooms, Sheldrake continues, exhibit fungal tactics and desires to solicit that which is more-than-fungus. “They are the parts of fungi made visible, pungent, covetable, delicious, poisonous” (11). The styles of locomotion, consumption, and reproduction fungi employ are alien yet familiar, echoing bacterial, mammalian, and vegetal regimes. However, their specificities beg investigation into unique modalities through which fungi could make cinematic art. What might these be?

I propose ‘mycomedia’, media derived from human animal-fungi entanglements. Like bacteria, fungi can feast on film’s gelatin-based emulsion, precipitating biofilms’ production. Anthropoc artists may also invite mushrooms to sporify on receptive media. Pursuing fungal specificity, I investigate artworks (mycomedia) where creative subjects (fungi) have been encouraged to sporify on a synthetic scaffold (film or paper) in a situation designed, yet not overbearingly controlled, by human animals. Contact prints made with spores are spore prints. If, after picking a mushroom, we placed them onto a surface, we might eventually find a spore print. These are inverted images of mushrooms’ undersides, made over time. When a mushroom is placed, gill side down, on receptive media (like film, paper, or the earth), spores can produce fugitive, inverted impressions of mushrooms’ architecture. Mushrooms, like many plants, solicit weather to reproduce, interpreting atmospheric variables before sporifying. How can fungi solicit weather to achieve reproduction? Emilie Dressaire et al. (2016) reveal how many mushrooms’ bodies and growing locations, and the mechanisms of sporification, are tailored to entice or guide air’s mobility. By increasing evaporation rates, mushrooms cool surrounding atmospheres, producing pockets of denser air around mushrooms and generating air currents propelling spores beyond the forest floor, into stronger air currents. Alternatively, consider the bird’s nest mushroom (*Nidulariaceae*), recalling a nest-like cup containing white mushrooms resembling eggs. *Nidulariaceae*’s morphology and growing locations maximise possibilities that raindrops will strike the cup,

projecting the egg look-a-likes outwards. Realising mushrooms' capacity to manipulate climatic rhythms by modifying weatherly power helps us acknowledge spore prints as co-productions where neither human animals, nor weather, nor fungi play exceptional parts. Spores' journeys only happen if air assents to mushrooms' use of its nebulous body as an intervening medium. Furthermore, many fungi rely on sporification to reproduce, whilst earthly life generally relies on fungi as keystone remediators. Spore prints highlight fungal and weatherly artistries' positive delicacies besides earthly beings' collective inability to live without atmospheric aid, an appropriately entangled category of artefact apropos to not only fungal lifeways but life on earth.

Photochemical film, paper, and soil are collectively amenable to spore printing. Spore prints can be produced on film and in forests, beyond anthropic interventions, calling us to interrogate fictitious boundaries separating cinema and earth. If analogue film-based spore prints constitute cinematic artifacts, what about prints made under identical conditions on paper or soil? Furthermore, spore prints are made in movement and time, by weather writing with spores. In their dimensions (movement, time) and procedures of development, alongside the variety of media forms' receptive to their production (film, paper, earth), spore prints beg inquiry into the possibility of cinematic artworks made without anthropogenic equipment or anthropic intervention. Might paper-based spore prints, produced by weather mediating spores' dispersal in movement and time, undergoing spontaneous change as spores perpetually decouple from surfaces, be approached as *cinematic*, if not *cinema*? Might cinema offer an exemplary prism to investigate mushrooms' and all life's *cinematic-ness*? Like phytograms and biofilms, cinematic spore prints exist on a creative continuum of fungal life, evoking the idiosyncratic formations fungi have been co-producing with weather since the beginning of myco- and meteorological time. Paper-based spore prints provide limit cases for what cinema is and stepping stones between *cinema* (industry) and the *cinematic* (life's

general expressivity, manifest when beings dynamically move in time, broadcasting biosemiotic information).

Investigating spore prints requires exploring fungal agencies alongside meteorological power. This is a logical movement based on mushrooms' connections with weather, manifest in fungal reliances on atmospheric energies as media of dispersal and fungal abilities to modify weatherly patterns. This chapter operates at cinema's conceptual and literal conclusion, moving beyond cinema as an exclusively anthropogenic phenomenon, proposing forms of cinema that may continue in post-industrial scenarios. I work between weatherly autonomy's gaseous prism and the nebulous process of fungal sporification whilst approaching weather as an unhinged force comprising cinematic affinities. How can I approach weather as a cinematic phenomenon? We generally verify weather's agency via its ability to make physical things move, like leaves, or mushrooms' spores. Weather's elementary particles primarily become appreciable when, gathering en masse, they precipitate tangible objects' mobility. This rule's outlier, perhaps, is the sun's rays which, though physical, are perceived via heat, light, and, in darkness, absence. When we see spores moving through and in the wind, we might investigate atmospheres as media of dispersal *and* exhibition, operating in manners comparable to analogue film. Furthermore, weather is a cinematic force, atmospheric director and precipitator of action. Weather throws disparate beings into accelerated and concerted motion, producing cinematic events. What do I mean by weather? The condition of the atmosphere at any moment, including air currents' direction and power, the ferocity of the sun's heat, and the intensity of rain. And cinematic events? These are artworks made with physical elements in multispecies environments without technological modulation, signifying as scenarios inviting audiovisual appreciation, like stormy seascapes or windblown woodlands, or a humble patch of grass wreathed in measured movements and peace, perhaps even enveloped by the obsidian hood of night. These events

scan as cinematic artifacts, produced by beings collectively moving in time, regularly precipitated by weather. Approaching *cinematic* events as a more-than-human form of *cinema* concerns orientation. Spore prints precipitate re-orientations, a category of artefact operative across various environments and media. Mushrooms invite a fluid gaze flowing between cinema screen and cinematic life without discretion. Furthermore, unlike its digital counterpart, analogue film is receptive to meteorological energy, analogous to a leaf. Like plants, analogue film offers surfaces against which weather can apply atmospheric pressure or distribute local materials, conveying a writerly ability by signifying in a register legible to us.

Weather, collaborating with mushrooms in spore prints, introduces a suite of enjoyments that are *cinematic* but not *cinema*. A *cinematic* experience might include watching spore prints emerge in forests, engineered by atmospheric interventions under moonlight in the night, echoing dust escaping a shaken rug. To realise earthly experiences' *cinematic* qualities we might investigate spore prints made on analogue film, before telescoping outwards, leaving *cinema* behind. Produced and persisting in identical dimensions (movement and time), animated by a force (weather) sharing with cinema, as Emil Leth Meilvang writes, "a similar motional substance" (2018: 81) alongside the cinematic talent to throw beings into concerted, dynamic motion, changing over time through escaping spores' itinerant mobility: what is the difference between these artefacts, besides substrates' materiality? We already speak of various media as cinematic: physical film, video, and digital software. Why not paper? The earth? Even living bodies?

This also concerns spectatorship. Cinema is generally made for an anthropic spectator, whereas cinematic events are not. We must attune ourselves to cinematic beings' modes of exhibition besides the idea that the world continues even when out of sight. Spore prints are living animations operative in cinematic vocabularies, produced by weather (a

cinematic force) in conjunction with fungi (a cinematic agent) who collaboratively make meaning by dynamically moving in time. Spore prints are prismatic jewels distilled from the alembical nexus of this conjunction, transforming into mycomedia when we participate in their co-production. They beg us to stretch prevailing conceptualisations beyond recognisable coordinates, blending human animals, cinema, and the earth. Rephrasing my formulation, my case studies include mushrooms sporifying on synthetic scaffolds (film or paper) by allying with an intervening medium (weather) that is itself a creative agent, the scenario requiring maintenance by human animals assuming the humble role of caretaker. We cannot say that weather is consciously creating art, whereas human animals might be. I say ‘agent’ and ‘artist’ to engineer approaches to more-than-human beings and forces as sovereign agents worthy of sustained attention and respect. To reference a perspective from the previous chapter, like biofilms, spore prints are “semi-living”: fugitive, spontaneous media prone to change (Catts, Salter, and Zurr 2022: 115). Semi-living media are archival conundrums, as mentioned in chapter 4, and ethical ones. Mushrooms’ spores are living matter and conditions of further life. Real life might proliferate from spore prints, in conceptual and material ways. Key filmmakers exude sensitivity to such questions. Wielding paper and film as media of fungal dispersal, they signpost anthropic artists’ ability to adapt practice to galvanise instead of eviscerate futurity.

I explore weather’s skill to impact filmmaking processes and extant media, producing cinematic art before cameras’ arrival. To begin, I analyse Anna Tsing’s work, before investigating ethnomycology. I conclude with some mycomedia by Anna Scime and Madge Evers.

TRICHOLOMA

MATSUTAKE

In Ishirô Honda's (1911-1993) *Matango/Attack of the Mushroom People* (1963), six urbanites are shipwrecked on an inhospitable island off mainland Japan. They shelter in an abandoned ship inhabited by orange fungi, quickly deciphering its purpose: studying oceanic radiation. They open a box, revealing an enormous variant of a *Tricholoma matsutake* mushroom, said to grow nowhere else. They want to eat it, recoiling when they realise its prodigious size and incarceration indicate nuclear exposure. Pots, pans, and plates are neatly arranged. The ship's former crew seemingly just walked out, tracing phantasmatic footsteps in the fungal hyphae, which crisscross the fetid dusts of abandonment. Where did they go, our protagonists anxiously wonder?

That night, ghastly humanoids snoop through murky portholes covered in fluorescent fungi, like living curtains. These visitations become progressively aggressive, testing the castaways' resilience. There's no food on-board, no edible plants outside, fresh water is evasive. Hunted, dehydrated, and starving, the party splinters. Mami (Kumi Mizuno), Yoshida (Hiroshi Tachikawa), and Kasai (Yoshio Tsuchiya (1927-2017)) are banished into the island. They discover a rain-soaked grotto where mushrooms grow rapidly yet seemingly in real time, scored to high pitched cackling. "They look gross", remarks Mami, before popping a little mushroom in her mouth. "Actually, they're so delicious", she swoons. Kasai begins shovelling mushrooms into his gullet, panting between overflowing mouthfuls. A

medium close-up of Kasai cuts to his perspective. Then, a match cut. Mushrooms phase into Tokyo's skyline, images of scantily dressed dancers layered on top. Mami disturbs Kasai's daydream. "If you eat this, you'll begin to look like a mushroom", she warns. "But once you eat one, you can't stop". Ironically, here, fungi trigger obscene gluttony, a culinary rhythm at odds with fungal life. Kasai gasps: "Yoshida!" Kasai catches Yoshida crouching behind some foliage, dangling a mushroom by its stalk, Yoshida's face rapidly changing. Kasai flees, but does not get far. Mushrooms stand up and start to move, groping for Kasai with mammalian hands.

What might we make of this curious, fungus-laden film? Anthony Camara offers an interpretation based on fungal associations with decay, arguing that the film takes as its target a contemporary Japan about to lose sight of its key cultural values. This cultural decay finds its expression in the grotesque bodies of the decomposing humanoid mushrooms, who subsequently signal a regressive or deconstructive momentum (2015: 82). The nuclear bombings of Hiroshima (6 August 1945) and Nagasaki (three days later) precipitated military capitulation, triggering an overhaul apparently comprising traditional values' erasure, and Japan's occupation by the United States. Camara investigates fungi—ecological decomposers *par excellence*—as signifying social rot and recyclical recombination, replacing traditional lifeways with ghastly alternatives. "*Matango* couples the decomposition of the human form with the simultaneous (re)production of the monstrous body, thereby suggesting the breakdown of the old society and the concomitant (re)formation of a new and hideous, yet patently regressive one" (72).

I advance a counter-reading grounded in fungal abilities to heal ravaged environments, such as those decimated by the nuclear bombings. Poetically, as Tsing tells us, "When Hiroshima was destroyed by an atomic bomb in 1945, it is said, the first thing to emerge from the blasted landscape was a matsutake mushroom" (2015: 3). Stamets captures

this rejuvenating power with ‘mycoremediation’, fungi’s exceptional talent to trailblaze landscapes’ remediation towards increased robustness. As Stamets explains, consider a site contaminated with petroleum, whose chemical bonds largely echo those found in plant bodies. Just as fungi are grandmasters when it comes to breaking down plant matter and unlocking valuable nutrients encased within the vegetal body, so too are fungi excellent at decomposing a broad variety of toxic chemicals. Consequently, following the introduction of certain fungi to petroleum rich environments, over half of the organic mass will cleave off as carbon dioxide, and up to a further 20 percent as water. This is why compost piles drastically shrink as they age (2005: 88). As mushrooms flourish amidst remediated soils, other beings emerge, following pullulating and decomposing mushrooms. As Stamets continues, following the removal of toxic barriers, waves of organisms will flood the previously inhospitable environment. Insects and bacteria come first, feasting on over-mature, decaying mushrooms, whilst vertebrates such as bears and squirrels, and human animals, will seek out fungi as comestible goods. Following bacterial intervention, aging mushrooms will release nutrients into the soil, co-producing a nutrient dense landscape, ready for the introduction of plant communities (Ibid.).

Fungi constitute the first wave of this ruderal avant-garde, first responders after environmental destruction. Furthermore, as Sheldrake points out, heavy metals and other toxins will accumulate and concentrate within fungal bodies. Consequently, extracting mushrooms actively accelerates the removal of toxins from an environment (189). Today, fungi flourish inside Chernobyl’s fourth reactor, ground zero of the Chernobyl disaster and one of the most contaminated environments on earth. Cal Flyn describes the aftermath of Chernobyl’s explosion on 26 April 1986, explaining how

Though the explosion at [the] fourth reactor had only a fraction of the force of the atomic bomb dropped at Hiroshima, the nuclear fallout it released is thought to have been 400 times greater [...]. Pregnant animals miscarried, their embryos dissolving inside them. [...] An entire forest of pine trees was scorched rust-red, dropping their needles and then dropping down dead. [...] After the initial evacuation of Pripyat town, the whole area was shuttered: 1,600 square miles, an area bigger than Cornwall, encompassing two major towns and seventy-four villages. [...] The official title translates literally as the Zone of Alienation. Others also know it as the Dead Zone. It is the most radioactive environment on Earth (2021: 65-66).

As the reactor's lid was blown off by a torrent of steam, radioactive graphite ('hot particles') peppered the landscape. Nelli Zhdanova et al. (2004) discovered that fungi were seeking out, growing towards and inside, and even actively decomposing these hot particles (1089). Were fungi eating the particles' carbon shell, or radiation itself? In a test where fungi were separated from hot particles yet subjected to their radiation, Zhdanova et al. proposed the latter (1093). Building on Zhdanova et al.'s observation, Lea Traxler et al. (2021) introduced the *Schizophyllum commune* (split gill) fungus to Kopachi village, an abandoned area approximately 5 kilometres south of Chernobyl. *S. commune* grew "8mm per day" (5), a startling finding given how *S. commune* grows 5-10mm per day in non-toxic media. And the more *S. commune* grows, the more *S. commune* accelerates landscapes' remediation, not only because removing fungal sections helps to decrease the levels of toxins in the environment, as they have been localised within a portable, cellular vessel (Sheldrake 104).

Consequently, we might contend that Honda invokes the phenomenon of mycoremediation. We should remember that the mushroom discovered by the crew is

grotesquely bloated, its abnormally large body possibly offering a visual signifier designed to communicate its hyperaccumulation of local nuclear toxins. Additionally, in *Matango*, fungi remain despite desolation, comestible goods helping to guarantee others' survival. Their ability to trigger anthropic metamorphoses further suggests they have absorbed contaminants, becoming-supercharged and acquiring new, transformative skills. In *Matango*, fungal companionship is life-giving and life-changing, and environmental ruination can be lived through by materially submitting to fungal rhythms. Departing from Camara, I propose investigating fungi beyond the negative ontology of decay, choosing *Matango* as a springboard to do so. As mentioned in chapter 4, organic processes of decomposition indicate microbial creativity, advancing planetary wellbeing. Decomposition moves forwards, not backwards. Amidst accelerating climate crisis, we must celebrate such rhythms as gifts others give so we can survive. A vocabulary comprising words like 'parasite', 'decay', and 'vermin' offers nothing to the intellectual frameworks of the future.

These reflections bring me to Anna Tsing, not least because Honda's fungus of choice was a matsutake mushroom. In *The Mushroom at the End of the World* (2015), Tsing examines matsutake mushrooms, long beloved in Japan. What can a mushroom teach us—and cinema—at the end of the world? Living through climate crises requires flourishing with others through mutually aggrandising covenants targeted at supporting rather than curtailing multispecies futures. A possible methodology of survival comprises exploring ruined landscapes, seeing who remains, and investigating how they flourish. By ruined landscapes, Tsing and I mean the environmental ruins created by capitalist interventions, which previous (and contemporary) capitalists believed could be kept apart from the safe spaces where the privileged live. "In a global state of precarity, we don't have choices other than looking for life in this ruin", says Tsing. "Matsutake are a place to begin" (6). Matsutake help navigate "the world that progress has left us" (206), capturing Tsing's attention because they flourish

when woodlands are continuously but not overbearingly disturbed by human animals. Contrary to beliefs expounded by various technophiles, it is unlikely that human animals will soon be able to live on other planets. Moreover, the 'journey to the stars' will almost certainly be reserved for a privileged few; or, alternatively, an under-class of workers who are sent to extract minerals, or set-up galactic civilisations. Nor can we live if we continue to annihilate the earth. Consequently, unable to withdraw, we must live on and with the earth, meaning we must disturb it at least some way. There is no past, present, or future beyond environmental disturbance. Matsutake show us what sustainable regimes of disturbance might be, flourishing when we refuse to leave them alone, disturbing without destroying. With matsutake, Tsing devises a theory of peaceable disturbance. With Tsing, I propose a film theory and practice grounded in multispecies disturbance.

Matsutake resist industrialised agriculture. This means we must meet matsutake halfway, where they live and in accordance with fungal desires. Matsutake are mycorrhizal, symbiotically growing with plants in co-dependent situations. This facet of their existence means we must consider bacterial and microbial, and more-than-human animal and vegetal desires, too, as perpetuating matsutake mushrooms' flourishing also requires leveraging their companions' flourishing. For example, Tsing explains how matsutake only live with certain trees, like pine (matsutake's beloved companion is red pine, *Pinus densiflora*) who struggle to grow if shaded. Matsutake proliferate when human animals fell broadleaves, unearthing mineral rich soils by precipitating small-scale erosion, producing well lit, nutrient dense understories. These are environmental niches pine and matsutake love.

This transformative mutualism has made it impossible for humans to cultivate matsutake. Japanese research institutions have thrown millions of yen into making

matsutake cultivation possible, but so far without success. Matsutake resist the conditions of the plantation. They require the dynamic multispecies diversity of the forest—with its contaminating relationality (Tsing 40).

Furthermore, matsutake are a gourmet delicacy and economic sensation, prized and craved worldwide. North American matsutake pickers have been known to make c. USD \$3000 in 1 day (Tsing 92). Matsutake mushrooms' economic value also explains why so much money has been dedicated to researching their cultivation. However, another stems from the fact that matsutake are a cultural phenomenon. By the Edo period (1603-1868), Tsing explains, matsutake were widely enjoyed, and the mushroom, flourishing as summer withdraws, eventually symbolised autumn. Autumnal matsutake hunts became analogous to cherry-blossom viewings in spring. Matsutake coincided with established autumnal signs, like deer crying at the harvest moon, and matsutake outings started attracting the social elite. Tsing explains how, when peasants stuck mushrooms in the ground because matsutake had not appeared, nobody minded: "Matsutake had become an element of an ideal seasonality, appreciated not only in poetry but also in all the arts, from tea ceremony to theater" (6). The Edo period concluded with the Meiji restoration (1868-1889), Japan's quick modernisation. Tsing explains how matsutake were common in the early 20th century, yet by the 1950s, they were vanishing as traditional woodlands were cut for timber plantations and urban development, or abandoned as people moved to cities. Fossil fuels replaced charcoal and firewood, whilst peasant woodlands went largely unused. Broadleaves proliferated on the unkempt verges of civilisational change and westernisation. Matsutake mushrooms withdrew as an after-effect of cultural metamorphosis. "By the mid-1970s, matsutake had become rare across Japan" (Tsing 7).

Matsutake relate, metaphorically and literally, to various desires. Consequently, as they themselves resist cultivation, matsutake cultivate styles of anthropic existence sensitively entangled with mushroomic regimes. To enable matsutake mushrooms' growth, human animals must alter their behaviours to manufacture certain conditions amenable to matsutake mushrooms' proliferation. Even then, matsutake might remain evasive. "All people can do to encourage its growth is to make the right kinds of disturbance in suitable forests and hope it [matsutake] appears" (Gooding 2016). Matsutake invite suites of non-overbearing exertions, occasionally responding with mushrooms. Matsutake woodlands are experimental testing grounds for recalibrated modalities of multispecies existence grounded in humble recognition of fungal recalcitrance. Tsing describes how one Japanese scientist spoke of matsutake as resulting from "unintentional cultivation", since human animals can only make matsutake's appearance more likely, never certain. Reciprocally, Tsing contends that human animals, woodlands, fungi, and more-than-human animals, all cultivate each other unintentionally, as woodlands overflowing with matsutake make human animals' appearance more likely, but never guaranteed. "Humans join others in making landscapes of unintentional design." (Tsing 152) "When Kato-san [one of Tsing's contacts] introduced me to the work he was doing for the prefectural forest-research service to restore the forest", says Tsing, "I was shocked." (151) Raised and educated in specific wilderness sensibilities as described by William Cronon in chapter 2, and expressed by North American figures like John Muir and Henry David Thoreau, Tsing assumed that forests were best at regulating themselves, with anthropic intervention bearing primarily negative effects. Yet Kato-san argued the opposite: Japanese matsutake require the presence of pine, and pine require anthropic disturbance. Therefore, as Tsing summarises, "Kato-san was not planting a garden. The forest he hoped for would have to grow itself. But he wanted to help it along by creating a certain kind of mess: a mess that would advantage pine" (Ibid.).

“Matsutake mushrooms are a mysterious gift from nature”, writes Flora Sonkin. In Japan, it is only through reconstruction by means of disturbance that such life can be seen to re-appear in these forgotten or abandoned landscapes (2016). Matsutake require our participation in earthly disturbance, yet never to the point of annihilation. Tsing explains that “Japanese scientists argue that matsutake forests are threatened by too little human disturbance” (218), and contends that “To restore woodlands for matsutake encourages a suite of other living things: pines and oaks, understory herbs, insects, birds. Restoration requires disturbance—but disturbance to enhance biodiversity and the healthy functioning of ecosystems” (152). Futurity requires disturbance, but only when sensitively executed. “This is not an excuse for further damage. Still, matsutake show one kind of collaborative survival” (4).

Disturbance operates across various spatial, temporal, and ontological scales. Every being can disturb, and conversely, every being uniquely experiences the effects of disturbance. “Disturbance brings us into heterogeneity, a key lens for landscapes. [...] As organisms make intergenerational living spaces, they redesign the environment. [...] A tree holds boulders in its roots that might otherwise be swept away by a stream; an earthworm enriches the soil (Tsing 161). Disturbance destroys and rejuvenates. From the Latin *disturbare*, to throw into disorder, the word comes laboured with negativity. At least western people are accustomed to thinking disturbance as something perennially unwelcomed. As if we could elect not to disturb. However, we might think of disturbance as indicating not chaotic disorder, but an alternate type of order, potentially grounded in sensitive exchange and multispecies development. Disturbance produces dynamic conditions for environmental futures co-built by various people. Tsing understands disturbance as a change in an environment that produces a change in an entire ecosystem. For example, floods, fires, or landscapes can be conceived of as disturbance. Human animals and all other creatures can

precipitate disturbance events. Importantly, disturbance can rejuvenate as well as destroy, and the style and degree of impact of any given disturbance event depends on a broad variety of factors, as well as scale. Disturbance can be minor, even seemingly inconsequently. Heavy winds knock down an aged tree, precipitating a light gap, which changes the floral constitution of a section of the forest floor, producing a preferred spot for birds or insects. By contrast, a tsunami off the Japanese coast might crash into a nuclear plant, triggering a global catastrophe. Time is also important, as a brief period of disturbance might lead into an extended period of environmental flourishing. We can look to what follows any disturbance event to navigate whether it was bearable or unbearable, absolutely destructive or permissible. That which follows is the reformation or annihilation of environments and the beings that exist within them (160). We should not investigate how *not* to disturb. By contrast, we must investigate how *to* disturb in mutually beneficial ways. Moreover, I might tolerate disturbances that, to others, would be unbearable. As Tsing points out, to consider disturbance, we must acknowledge our own viewpoint, since a disturbance event will impact us and, for example, ants differently. Disturbance is never simply destructive or rejuvenating, acceptable or despicable. Disturbance is an open-ended, mercurial conundrum based on a shifting set of criteria and phenomena, all of which unsettle to greater or lesser degrees (161). Matsutake model methodologies of living beyond domination and withdrawal, grounded in thoughtful disturbance. Another word for disturbance is reciprocity, loosely definable as mutually beneficial transactions. Yet another is instrumentalisation, asymmetrically using someone to satisfy a selfish desire. Disturbance is a complex, multifaceted spectrum comprising many levels and degrees. Investigating how *to* disturb without destroying brings one outside themselves, into contact with recalcitrant others resonating along alternate trajectories.

Disturbance is a lens for analysing ecosystems. Disturbance applies to cinema, too. I investigate mycomedia as disturbance based ecologies, emerging as multiple lifeways clash and converge. Mycomedia are patchy, multispecies assemblages comparable to Tsing's woodlands, helping explore the fecundity of sympoiesis, of following, making- and living- with mushrooms. Mycomedia reveal what happens when various lifeways intertwine on media amenable to fungal sporification. Their teachings impact daily life, as the earth is a comparable medium amenable to spore prints' production. Landscapes signify as mycomedia, generative phenomena co-built by human animals and fungi. Moreover, mycomedia are not only *about* disturbance. They *are* disturbing, muddying traditional beliefs about human animals' exceptional ability to make cinematic art, derailing traditional narrative and formal paradigms, introducing new perspectival regimes. Mycomedia precipitate exploration of environmentally restorative ways of making cinematic art even whilst blowing up prevailing beliefs about cinema as an anthropogenic phenomenon.

PHARMAKON

Tsing examines mushrooms as keystone remediators. I investigate mushrooms as artistically and pedagogically insightful companions whose lessons pertain to ecosystem stewardship and cinema. How else have mushrooms been encountered? Poison, remedy, scapegoat.

Mushrooms can be explored through the lens of the *pharmakon*. I am using the word—*pharmakon*—in its traditional sense, as a medicinal item or remedying act that operates in the tension between destruction and salvation. The *pharmakon* might heal as it kills, poisoning and purifying at once; or, more precisely, it is a salvific toxicant which purifies by means of intoxication. Take the related word *pharmakos*, for example, meaning the ritual sacrifice of a human animal, often a criminal, designed to remedy some civic unrest or calendrical crisis. Loved and feared, craved, venerated, and despised, mushrooms are ambivalent signifiers. Robert (1898-1986) and Valentina (1901-1959) Wasson parse the earth according to a love (‘mycophilia’) and fear (‘mycophobia’) of fungi (1957a: 319). Their book, *Mushrooms, Russia and History*, a trove of references and insights, introduced me to many of the literary and visual artworks I go on to explore. Concerning western perspectives, the Roman naturalist Pliny the Elder’s (c. 23/24-79 CE). *Natural History*, written around 77 CE, is key. In *Natural History*, Pliny approaches mushrooms as malformed plants, associated exclusively with decay.

The generative principle of the mushroom is in the slime and the fermenting juices of the damp earth, or of the roots of most of the glandiferous trees. [...] In general, these

plants are of a pernicious nature, and the use of them should be altogether rejected; for if by chance they should happen to grow near a hob-nail, a piece of rusty iron, or a bit of rotten cloth, they will immediately imbibe all these foreign emanations and flavours, and transform them into poison (B. 22, C. 46).

For Pliny, mushrooms *literally* mopped up worldly poisons, becoming poisonous themselves. In Medieval Europe, mushrooms *metaphorically* stored within themselves epochal anxieties, associated with spiritual contagions, satanic escapades, and downright devilry. However, despite mushrooms' perceived toxicity, ancient Greek and Roman vocabularies invoked heady mycophilia. In Latin, mushrooms were *deorum cibus*, Food of the Gods (Wasson 1980: 42). Echoing the Romans, as Robert Wasson explains, the ancient Greeks likewise knew mushrooms as *broma theon*, "Food of the Gods" (1978: 5). Porphyry (c. 234-305 CE), Roman student of Plotinus (c. 204/5-270 CE) and editor of *The Enneads*, supposedly called mushrooms "nurslings of the Gods, *theotrophos*" (Ibid.; emphasis in original). Mushrooms were mythologised, too. Towards the second century CE's conclusion, in *Description of Greece*, Pausanias (c. 110-180 CE), the Greek chronicler, describes Perseus's foundation of Mycenae. "Perseus was thirsty, and the thought occurred to him to pick up a mushroom (*mykes*) from the ground. Drinking with joy the water that flowed from it, he gave to the place the name of Mycenae" (B. 2, C. 16, S. 3; emphasis in original).

By the 18th century, James Bolton (1735-1799) explains how "The plants which now compose the Order Fungi, were formerly supposed to be of equivocal generation, the sport of Nature, the effect of Putrefaction, or the brood of Chance; but that they owe their origin to the seeds of a parent plant, is now well known" (1788-1790: I, xiv). It took nearly two millennia for fungal modes of reproduction to be recognised, and fungi addressed beyond the negative

ontology of decay. However, Bolton still approached fungi as plants, overlooking fungal specificity. These developments did not coincide with fungi being spared scorn in literature from this period and after. Arthur Conan Doyle (1859-1930), in *Sir Nigel* (1906), employs mushrooms to signal the Black Death's arrival in England.

The fields were spotted with monstrous fungi of a size and color never matched before, scarlet and mauve and liver and black. It was as though the sick earth had burst into foul pustules; mildew and lichen mottled the walls, and with that filthy crop Death sprang also from the water-soaked earth (1-2).

Different cultures' views contradicted British tastes. "The Russian reader would put imperious questions to Conan Doyle", write Wasson and Wasson (1957b: 32). This imaginary reader might request more accurate descriptions of such fungi, requesting additional information, such as: were these mushrooms edible, or maybe even delicious? Why did Doyle or his countrymen not harvest and preserve them in order to fortify their larder for the winter? (Ibid.) "How different would be the description of such a scene by a Russian", they continue, "who loves his moist Mother Earth, the autumn haze, the 'mushroom-rain', the humus rotting in the woods, and above all a splendid crop of mushrooms!" (Ibid.). In Leo Tolstoy's (1828-1910) *Anna Karenina* (1878/1901), whilst Levin races to mow the Mashkin Upland, the labourers keep their eyes peeled for mushrooms.

Among the trees they were continually cutting with their scythes the so-called 'birch mushrooms,' swollen fat in the succulent grass. But the old man bent down every time

he came across a mushroom, picked it up and put it in his bosom. “Another present for my old woman,” he said as he did so (1878: 393).

Compared to Russian predilections and measured against reality, British revulsions become tricky to equate with lived experience. How did these vehement feelings originate?

Apparently, this has lots to do with toads.

Medieval eyes saw toads as Satan’s familiar, signifying lechery and greed, as Wasson and Wasson explain, “the very incarnation of a soulless homunculus [...]: a horrible caricature in miniature of sensual man and miserable sinner” (187-188). Toads signified Satan’s presence alongside sexual licentiousness, their wart-laden body symptomatic of promiscuity and unhygienic liaisons, like the bulbous wart dangling from a witch’s nose. For example, in 1233, Pope Gregory IX (1170-1241) issued the notoriously esoteric Papal Bull titled *Vox in Rama*, describing the indoctrination rites of a supposedly buoyant cult in the dioceses of Mainz and Hildesheim.

At first, a certain postulate enters this school of perdition and is received. A kind of frog appears, which some are accustomed to call a toad. Some kiss it on its rear end and others give the damnable kiss on the mouth, receiving the tongue and saliva of the beast in their mouth (Gregory IX qtd. in Engels 1999: 184).

Mushrooms, long known to inebriate, were linked to toads, whose venom supposedly killed. Like toads, mushrooms poisoned and possessed, their power to initiate sickness or delirium fueling identifications as vehicles of diabolical visitation. Britons still apply the perjorative to

wild mushrooms, toadstool, yet as Wasson and Wasson curiously observe, toads have no relation to fungi, neither sitting under nor near to them, and nor are they interested in eating or engaging with them in any way. Consequently, Wasson and Wasson propose that such a perspective must bear no relationship to an observation garnered from the British environment (1957b: 65). By contrast, the link conjoining fungi and toads must report instead to British folkways, wherein mushrooms are bound to toads through the prismatic figure of the witch.

In Britain, mushrooms were associated with witches, regularly believed to take cats and toads as familiars (Satan apparently frequently appeared as both, depending on the circumstance or objective: toads or cats). Furthermore, in *The Witch-Cult of Western Europe* (1921) and *The God of the Witches* (1931), Margaret Alice Murray (1863-1963) contends that western Europe's pre-agrarian religion was a fertility religion whose practitioners were systematically massacred as witches during the Middle Ages and Early Modern period (1931: 49-50). According to Murray, witches worshipped the Horned God, depicted in Francisco de Goya's (1746-1828) *Witches' Sabbath* (1798) and, additionally, *The Great He-Goat* (1821-23), 1 of Goya's 14 so-called Black Paintings, applied in oil directly onto the walls of his house and created when Goya, in a condition of physical despair following an earlier illness which had left him deaf, had entered a state of near total isolation. Building on Murray's work, Wasson and Wasson suggest that the Horned God went in Medieval and Early Modern England as Robin Goodfellow or Puck. Who is Robin Goodfellow? A mainstay of British folklore, Goodfellow is a significant sprite or fairy, a lover of benign mischievous and sometimes wicked pranks, and, rather strangely, an enthusiast for order and domestic cleanliness. Goodfellow was known to waylay travellers in the night *and* clean homes in exchange for milk or cream. He could change his shape in many ways or none, assuming his fairy form, yet frequently assumed the visage of an ass. Puck, as Murray explains, "derives

through the Gaelic *Boucca* from the Slavic *Bog*, which means God” (1921: 238; emphasis in original). Oberon, supposedly Goodfellow’s or Puck’s homeland but also, in Shakespeare’s *A Midsummer’s Night’s Dream* (c. 1595 or 1596) the Fairy King whom Puck serves, apparently derives from *Auburon*, which, as Wasson and Wasson propose, relates to *albus*, Latin for white. *Auburon* is occasionally written as *Oberon*, and it is the name given to a fleshy, white mushroom of prodigious size. In a season exhibiting the right climactic conditions, Wasson and Wasson explain, forests floors in certain areas will be carpeted with mushrooms of many kinds, yet dominated by the pale *Oberon*, which looms large as if a king. “It is no wonder that Oberon is king of the fairies” (1957b: 147-148). Goodfellow appeared in rings of dancing witches, as the 1629 *Robin Goodfellow: His Mad Prankes and Merry Jestes* shows. These nights of debauchery left circular tracks indicative of tiny feet trampling over blades of dew-laden grass. These were frequently accompanied by circular crops of mushrooms, unnerving formations Britain’s rural population administered the occult label: fairy ring.

How have we moved from mushrooms, to toads, to witches, to fairies? Witches, Murray says, practiced the religion of the ancient Britons, who were known as the fairy-folk. “That there was a strong connexion between witches and fairies has been known to all students of fairy lore. I suggest that the cult of the fairy or primitive race survived until less than three hundred years ago, and that the people who practised it were known as witches” (Murray 1921: 238). Apparently, Murray contends, fairies were not always cheeky sprites participating in moonlit mischief. “It was not until after the appearance of *A Midsummer Night’s Dream* that the fairy began, in literature, to decrease to its present diminutive proportions” (1931: 42). As Murray continues, the fairyfolk descended from the early inhabitants of northern Europe. Instead of nomadic, they were pastoral, and they thrived in the unforested parts of the continent, because they raised cattle which required open land for grazing (48). Furthermore, on the topic of fairy rings, John Ramsbottom (1885-1974) explains

how such formations went by a range of names, such as fairy walks or fairy courts, and in Sussex, hag tracks (1953: 228). As is well known, hag is another word for a witch.

Compounding the layers of significance, Ramsbottom continues, “In France enormous toads with bulging eyes [were believed to] abound within the ring, and any but unintentional entry brought [...] retribution” (Ramsbottom 232). William Withering (1741-1799), in the second edition of *Systematic Arrangement of British Plants* (1833), first identified fairy rings as fungal, not occult, in origin. However, by now, mushrooms’ ghastly links had set like iron. Toads, witches, and Satan coincide in mushrooms, who proliferate in strange formations, regularly emerging in the dead of night (the witching hour) amidst alternate types of crop circles, similarly indicating alien visitations. Eaten with passion in Russia, passionately scorned in Britain. Antidote and curse, toxicant and saviour, antithesis to holy things.

Pharmakon.

By contrast, John Marco Allegro (1923-1988), in *The Sacred Mushroom and the Cross* (1970), explores fungi as key components of Christianity’s origin. Allegro was a scholar of the Dead Sea Scrolls, religious manuscripts written predominantly in Hebrew, dating from the 3rd century BCE to the 1st century CE. Through them, Allegro discovered the *pesharim*, exegeses based on the idea that scripture is written for multiple audiences. First, a superficial layer of meaning for the lay reader, conveying straightforward moral guidelines in the form of relatable stories. Second, a deeper layer for the specialist, only decipherable with an elaborate knowledge and ciphers. Allegro applied this to the Christian bible to uncover Christianity’s seminal connections with hallucinogenic fungi. The book terminated Allegro’s academic career at the same time as it secured him celebrity. How did Allegro reach this daring conclusion? For Allegro, the bible was a cryptogram produced by an Essene fertility cult where psychedelic mushrooms operated as entheogens, psychoactive substances ingested ceremonially to precipitate visionary experiences. Modern Christianity stems from a need to

shield mushroom cultists from Roman persecution. These cults became detectable alongside Sumer's emergence in the fourth millennium BCE, growing increasingly clandestine until some cataclysm forced them underground. This cataclysm, as Allegro proposes, was the Jewish Revolt of AD66, which provoked Rome to its vicious reaction, resulting in the destruction of Jerusalem and the ravaging of the Temple Mount. The mystery cults, galvanised around the figure of the sacred mushroom, were driven into the desert, and their secrets, if not to be lost forever, needed to be stored in writing and yet in code so as to keep any antagonistic authorities in the dark about such a cult's continuation (xiii-xiv). However, Allegro continues, what began as a strategic hoax trapped those who came afterwards, who eventually accepted as doctrine the biblical fiction designed as a cryptogram to preserve in secrecy the core tenets of the mushroom religion. Above all such believers purged from their central texts and collective memory the vital element on which their religion depended, as well as that religion's reliance on a naturally occurring drug capable of triggering the mystical, ecstatic experiences that were utilised to bridge the sublunary and the divine; in short, they forgot "the key to heaven – the sacred mushroom" (xiv). Allegro's conclusion relies on Sumerian, "the oldest written language known to us" (xv), providing a common root to "the Indo-European languages (which include Greek, Latin, and our own [English] tongue) and the Semitic group, which includes the languages of the Old Testament, Hebrew and Aramaic" (xv-xvi). Triangulated through Sumerian, the bible may be deciphered as a guidebook for the mushroom cultist.

For example, the miraculous birth invoked mushrooms' appearance. "The mushroom has always been a thing of mystery", says Allegro. "The ancients were puzzled by its manner of growth without seed, the speed with which it made its appearance after rain, and its as rapid disappearance" (xv). Like the divine infant, it uniquely arrived without fertilisation or fructification, as if from nowhere. The sacred mushroom was a symbol for Jesus Christ, or

vice versa, as it arrived miraculously, without the need of a progenitor's intervention (Allegro 55). A maverick, Allegro now enjoys company. Jack Herer and Jan Irvin break with Allegro if only to advance his argument. "Were psychoactive drugs involved in the foundation of Christianity?", Herer and Irvin wonder,

I submit, against what Allegro and other scholars have argued, that this was not a mushroom cult of the fringe heretical sects at all. I propose that the holy mushroom had a widespread and integrated role not only in Greek Orthodox Christianity but [...] as a fundamental part of the origins and history of Christianity as a whole (2008).

Herer and Irvin examine *The Epistle of the Renegade Bishops*, written by Ivan Vysensicyj at the Xeropotamou Monastery in Greece in the 16th century CE. In this document, Vysensicyj describes the veneration of the Forty Martyrs of Sebaste, a group of Roman legionaries martyred after professing their loyalty to Christianity.

When the names of the forty martyrs were pronounced by the archpriest, there began to grow from the foot of the holy table a holy mushroom [...] which ascended over the holy table and overshadowed the entire sanctuary. [...] And then the infirm found in the cloister were healed through the possibility of tasting the holy mushroom.

(Vysensicyj qtd. in Herer and Irvin)

Furthermore, fungi also abound in Christian art. Herer and Irvin consider the 13th century fresco at Plaincourault Chapel in Mérygnay, France, comprising Adam and Eve flanking a tree

recalling an *Amanita muscaria* mushroom, ensnared by a serpent carrying a red bauble.

Maybe an apple? Possibly a mushroom?

Considering such artistic phenomena, Julie and Jerry Brown explain that “There is no identification of the ‘fruit’ of the Tree to be found anywhere in the Bible: not in Genesis nor in any of the books of the Old or New Testament. In fact, the first reference to the fruit as an apple does not appear until the 16th century”, (2019: 6) long after the fresco’s creation.

Additionally, the tree’s canopy recalls *A. muscaria*, whose red cap comes flecked with white.

Mushrooms, moreover, were abundant beyond the Garden. Consider the 11-12th century

fresco at Saint-Savin sur Gartempe, including hallucinogenic liberty caps (*Psilocybe semilanceata*) sprouting alongside God during the stars’ creation. Additionally, if

Plaincourault reproduced the Tree of Knowledge as a hallucinogenic mushroom, the biblical

story is irredeemably transformed, say Brown and Brown. In this alternative scenario, the

serpent is not a deviant trickster, conversely offering profound wisdom and intellectual

freedom. Genesis is no longer about human animals’ fall from grace, but transcendence

coinciding with mental elevation. Importantly, Eve is not some weak-willed patsy who

condemns humanity to a life of sin. By contrast, Eve is a spiritual guide comparable to a

courageous shaman who leads human animals towards higher levels of emotional and

spiritual complexity. “Invoking Occam’s razor,” as Brown and Brown continue, “we suggest

that this interpretation of Genesis and Plaincourault parsimoniously resolves two biblical

puzzles: the identification of the Tree and the presence of evil in the Garden of Eden” (7-8).

In contrast to Europe, in Mesoamerica mushrooms have been venerated for at least three

millennia. Spaniards immediately fixated on the Aztecs’ mycophilia, arguably confirming

European taboos. In 1524, Fray Toribio of Benavente (1482-1569), also called Motolinía,

arrived in the Viceroyalty of New Spain, tasked with the systematic evangelisation of

Mesoamerica’s Indigenous population. I owe thanks to Wasson for this reference, which, I

believe, illuminates European anxieties and the entrenched taboos surrounding mushrooms' consumption, documenting the moment at which a (mycophobic) western religion crashed into a (mycophilic) community within which mushrooms were venerated and consumed as holy gifts and vehicles of divine visitation. Toribio writes that

They [the Nahuatl] had another way of drunkenness that made them more cruel and it was with some fungi or small mushrooms, which exist in this land as in Castilla [...]. They [...] eat with them a little bees' honey; and a while later they would see a thousand visions, especially serpents, and as they would be out of their senses [...]; and with this bestial drunkenness and travail that they were feeling, it happened sometimes that they hanged themselves, and also against others they were crueller. These mushrooms they called in their language *teonanácatl*, which means 'flesh of God', or the devil whom they worshipped (Motolinía qtd. in Wasson 1980: xvii; emphasis in original).

Robert Wasson proposes that Motolinía framed fungi's ceremonial use as "an appalling simulacrum of Holy Communion" (xviii). As 'God's flesh' or 'flesh of God', *teonanácatl* recalled the Christian Eucharist. Furthermore, to this phrase Motolinía offered, as a substitute, *came de dies*, 'god's flesh', alongside a second translation, "*came del demonio*, 'Satan's flesh'" (Wasson and Wasson 1957a: 230). Yet *teo-*, from *teotl*, 'god', equates, rather, to 'great' or 'sacred' (Ibid.). *Nanácatl* is the plural of *nácatl*, 'flesh'. According to Robert Wasson, in the Nahuatl language, supposedly inanimate things are addressed with a singular noun, whereas plural forms are utilised when things enjoy "a soul" (1980: 41). Consequently, "*Tetl*, 'stone', becomes *teme* in the plural, but only when it refers to graven images" (42;

emphasis in original). Robert Wasson explains that *Nanácatl*, built on *nácatl*, is a fairly generic metaphor akin to ‘food’, ‘victuals’, or ‘metal’. Yet by doubling the initial syllable *na-* it achieves a pluralised form unique, in the vegetable world, to mushrooms. Every mushroom – *nanácatl* – is linguistically gifted a soul, elevated on account of its relation to the entheogenic mushrooms, which embody and share their divinity. Furthermore, the plural form – *nanácatl* – becomes increasingly exalted when it is preceded by, for example, *teo-* or *xochi-*, thus becoming *teonanácatl*, and designating specifically the mushrooms used to trigger entheogenic and hallucinogenic experience (Ibid.). Therefore, as Wasson says, Motolinía was confused, if not intentionally overreacting. His choice of words connected the sacred mushroom to the elements of the Christian mass, therefore establishing a competition between the mushroom and Christ’s sacred body and redeeming blood. “That innocent word suddenly became charged with the high voltage of sixteenth century *odium theologicum*. [...] *Teonanácatl* means the divine or wondrous or awesome mushroom, nothing more and nothing less” (Ibid.; emphasis in original).

Nevertheless, the Spanish invasion did not fully suppress mushrooms’ consumption, which continues amongst Mazatec communities living in Oaxaca. Mazatec vocabularies reference *ntisito*, not *teonanácatl*. *Sito* means ‘that which springs forth’. The first syllable, *nti*, explains Wasson, adds “deference and affection” (1980: 45), and we get “The dear little ones that leap forth” (Ibid.). Western audiences largely learned about Mazatec-fungi affiliations through María Sabina (1894-1985), a *curandero* or “‘wise woman’—a term that we may choose to translate as ‘shaman’ or, by a further twist, [...] ‘poet’—” (Rothenberg 1981: 7) from Huautla de Jiménez. Sabina ingested hallucinogenic mushrooms to perform key functions in her community. In Alvaro Estrada’s interviews, Sabina explains that

I take *Little-One-Who-Springs-Forth* and I see God. I see him sprout from the earth. He grows and grows, big as a tree, as a mountain. [...] At other times, God is not like a man: he is the Book. A book that is born from the earth, a sacred Book whose birth makes the world shake. It is the Book of God that speaks to me in order for me to speak. It counsels me, it teaches me, it tells me what I have to say to men, to the sick, to life. The Book appears and I learn new words. [...] They help me to cure and speak. In the vigils I clap and whistle; at that time I am transformed into God (Qtd. in Estrada 56; emphasis in original).

This planetary network comprising religious beliefs and folkways itself invokes the fungal anatomy, convoluted and seemingly endless. These references generally exude anxiety or excitement over infectious scenarios where we have been altered by fungi's transformative touch, potently manifest in fungi's psychedelic powers. None approach 'fungi-as-fungi'. How might we welcome fungi to communicate with us on their own terms, helping us acknowledge, if not entirely comprehend, their subjectivity? Before tackling this question, I must examine some artistic and scholarly engagements with weather.

BREACH

China Miéville's novel *The City and the City* (2009) follows a murder investigation between Beszel and Ul Qoma, two cities sharing one geographical space. Inhabitants of either state must unsee each other or risk extreme punishment, monitored by the punitive force, Breach. That which refuses to acknowledge such fictions are weather, more-than-human animals, and trash, whose ownership is equally hazy. Miéville tells us that

The scents of Beszel and Ul Qomatown are a confusion. The instinct is to unsmell them, to think of them as drift across the boundaries, as disrespectful as rain ('Rain and woodsmoke live in both cities', the proverb has it. In Ul Qoma they have the same saw, but one of the subjects is 'fog'. You may occasionally also hear it of other weather conditions, or even rubbish, sewage, and, spoken by the daring, pigeons and wolves) (66).

Miéville captures weather's irreverent proclivity to drift and exceed anthropic control. In Miéville's book, weather horizontalises, a vector by which we may think beyond the arbitrary geopolitical cartography of space, and species' divisions.

In the west, weather is predominantly visualised as an accumulation of chemicals or elements. This is not a universal belief. For a different view of weather we might look to Alisi Telengut, a Canadian visual artist of Mongolian origin. Telengut regularly relays her

grandparents' worldviews, who lived nomadically on Mongolian grasslands. In *Tengri* (2012), Telengut exhibits a Mongolian wind burial where corpses are transported on carts until spiritual powers, manifest in meteorological or topographical interventions, make them fall. In these mortuary scenarios, bodies are not buried and wherever they land becomes a humble tomb, nutritional gifts to the earth. *Tengri* begins with an ultramarine sky. Motes of silver and gold pirouette, kaleidoscopes of spirits coalescing as a glittery orb. An anthropic spirit lingers in a landscape below, eventually joining the joyous swirl. Later, we see the spirit's body on earth, lifted onto a cart and carried away until it flies skyward, like its spirit, with the wind. In *Tengri*, weather overlaps with us but lives beyond our ambit, an excessive agency evading total restraint.

Furthermore, as French philosopher Luce Irigaray asks, "Is not air the whole of our habitation as mortals?" Is not air the element in which human animals are most at home? In contrast to fire, water, or earth, it is in air where we can exist peacefully and in comfort (1999: 8). "Our being", says Eva Horn in 'Air as Medium' (2018), is always "being in the air" (23), the very "condition of possibility" (12) of biological and social life. Horn continues, explaining that "The air enables movement and perception (hearing, sight, and smell), as well as communication, travel, situatedness, and dislocation, inasmuch as it joins the members of societies and cultures in a common climate" (9). Air is our medium. Addressing weather as our medium automatically means addressing weather as cinema's medium, too. For example, concerning the projection of audiovisual media in standard exhibition contexts, we require the presence of air to facilitate light's journey from bulb, to strip, to screen of exhibition. Furthermore, "The old idea that media are environments can be flipped", writes John Durham Peters, "environments are also media" (2015: 3). If we think of media as systems by which meaning is communicated, like an audiovisual artefact, then such phenomena rely on, materially and thematically, more fundamental systems of media that rarely speak in

mammalian registers, although they can, albeit with the help of a mediating interlocutor, like analogue film (2-3). Additionally, the cinema industry relies on others to provide the thematic and material conditions by which it may operate, like weather. Filmmakers generally fail to acknowledge cinema's weatherly debts, producing artifacts where more-than-human forces and beings are relegated to the background. As Dai Vaughan (1933-2012) explains, the apparently (but not truly) infinite replicability of digital technology lets us negate meteorological forces' intrusions into the frame (1999: 5). Scenes can be filmed and re-filmed until weather is assimilated into narrative or erased. How might artists wield cinema as a vehicle by which meteorological artistry might be addressed as active in cinema, and beyond it?

Siegfried Kracauer considers what cinema over and against the other arts is uniquely equipped to capture and represent. In *Theory of Film* (1960), from a passage I also drew from in chapter 3, Kracauer proposes that

The cinema is conceivably animated by a desire to picture transient material life, life at its most ephemeral. Street crowds, involuntary gestures, and other fleeting impressions are its very meat. Significantly, the contemporaries of [Auguste and Louis] Lumière praised [their] films—the first ever to be made—for showing ‘the ripple of the leaves stirred by the wind’ (ix).

What explains this kinship, in respect of which meteorological secrets reveal themselves as if the camera was a beloved relative, bound not by blood or bone but rather ontological similarities and convergences? In ‘Cinema, meteorology and the erotics of weather’ (2018), Meilvang interprets and conflates weather's and cinema's

ontological connections by construing “cinema *as* weather, [...] the radical end point” for any discussion of weather in cinema (80; emphasis in original). As Meilvang continues, to approach cinema as resembling weather in its fundamental reliance on movement precipitates a conflation of cinematic and environmental ontologies and a theory of film that is informed by the earth sciences. This theory of film does not track narrative or interpretive cues, instead it is focused only on movement, rhythm, and sensation. It also elevates artworks into artefacts which problematise and elevate the idea of art itself, as media able to be worked or co-produced by human and more-than-human craft, for example (81).

Weather and cinema share a “motional substance” (Ibid.), mutually defined by unceasing movement expressed and rendered in time. Meilvang argues that this observation transforms our understanding of cinematic art, but I believe that Meilvang can go further. If we truly acknowledge weather’s and cinema’s ontological coincidence, then weather may operate cinematically in cinema’s absence, and conversely, cinematic media would recall weather even when not depicting meteorological phenomena. This observation precipitates an ontology of life as inherently cinematic, alongside a philosophy of cinema as inherently tethered to life. It operates at the convergence of biosemiotics, meteorology, and cinema, where beings’ semiotic abundancies signify as cinematic media, and we are not alone in our capacity to make cinematic art. For neither weather nor cinema are exceptional in their related abilities to make meaning whilst moving in time. They share this skill and identity with all biosemiotically proficient phenomena capable of signifying by dynamically moving in time. This encourages us to approach living beings’ semiotic rhythms, their significant gesticulations and biological emissions, and environmental scenarios animated by weatherly momentum as cinematic phenomena. Beginning with weather’s cinematic affinities, we

approach the end of any discussion of cinema whatsoever, concluding with the earth's transformation into a provisionally infinite gallery of cinematic being.

Meilvang explores another element of “cine-meteorology” (77), weather's unhinged vitality, through Lumière's *Le Repas de Bébé/Baby's Dinner* (1895), referenced by Kracauer and myself in chapter 3. What captivated viewers was the uncanny agility of vegetal bodies stirred by the wind, writes Meilvang. In the supposedly blank spaces occupying the fringes of anthropic action, we find weather signifying on its own accord, and in a way that contributes little to nothing to the film's narrative or progression. “Rather, the weatherly cine-phenomenon is an end unto itself [...]. Cinematic weather can never be fully instrumentalised in narrative” (67-68). Vaughan looks to another Lumière film, *Barque sortant du Port/Boat Leaving the Port* (1895), made by Louis and his brother, Auguste. The film comprises one shot of a boat carrying three men from a harbour, past a jetty on which some women and children stand, out to sea. After cresting the jetty, the vessel escapes the boaters' control, spinning in place. Then the film ends, awkwardly *in media res*, bound by the incipient technology's durational shortcomings. Vaughan was struck by watching human animals at weather's mercy, arguing that the invasion of such a spontaneous, weatherly phenomenon signalled the radical inversion of an enshrined system comprising an inert, represented world and an agential, communicative human animal. In the film, weather not only threatened the diegetic human animals, but escaped the representative act to impact the story of its own accord (6). Weather signifies as a real and conceptual threat, evading anthropic desires to instrumentalise weatherly semiosis, even departing from a certain type of order to propose an alternate system or orderly regime (weather, too, can precipitate positive events of disturbance, as theorised by Tsing). The spectre of anthropic mortality dogs the film, active in the boaters' struggles which, vitally, are never diegetically resolved. The maritime scenario bears the possibility, however minor, of anthropic death, as if the film housed a deadly

creature, which looms up and reveals its dangerous potency in the form of the threatening waves.

Vaughan explains that early viewers were enamoured by such phenomena, too. What captured the first audiences, Vaughan argues, were “incidentals of scenes”: smoke, steam, dust, or wind in the trees (4-5). Although such phenomena would scarcely be remarked on today, at cinema’s arising they captivated audiences, who scoured the frame edge in wonderment in lieu of the anthropic action taking centre stage (Ibid.). But the technological mobility of otherwise supposedly inert things gripped viewers’ attention, not motion in general. Vaughan continues, suggesting that whilst moving images of human animals were accepted without strong feeling because they formed part of a logical technological progression, moving scenes impacted by weatherly phenomena were startling, and the idea that elements previously conceived of as inanimate should participate in their own representation was, simply put, astonishing (5).

Human animals’ performances lacked weather’s higher charisma. This state, however, is provisional. For as anthropic actors, in the form of the stranded boaters, respond to weatherly intervention, they are integrated into the event’s more-than-human spontaneity. “The unpredictable has not only emerged from the background to occupy the greater portion of the frame; it has also taken over the protagonists. Man, no longer the mountebank self-presenter, has become equal with the leaves and the brick dust—and as miraculous” (Ibid.). Furthermore, Pick, in ““Nothing now but kestrel”” (2017), analysing *Repas* and *Barque* side-by-side, argues that

The operation of natural law on waves, leaves, and people alike reveals the mechanisms of the world as radically egalitarian. The woman who looks on

intriguingly, perhaps anxiously, may or may not have discerned this earthly truth.

For us, she, too, is incorporated into the natural scheme that the film shows.

Cinema [...] makes this reality clear (49).

Weather authorises and reveals earthly things' kinship, their connection determined by shared exposure to atmospheric force. Robotically unbiased and designed to render the mobility of spatially contiguous beings operating in time, cinema, ontologically comparable to weather, is technologically keyed to relay this meteorological law.

Weather overflows with beauty. Yet, as we are discovering with increasing awareness, it wields terrifying power. Ecological crises are predominantly products of atmospheric damage. Atmospheric turbulence is a scouring energy signifying planetary futures without us. Yet truthfully speaking weather cannot conduct violence, only dispassionate action some haphazard repercussions of which include triggering human animals' mortality. But weatherly affliction is largely experienced by the least culpable, quickened by western excess, felt most keenly elsewhere. Ecological crises are racialised and political. But this does not negate the truth of meteorological objectivity. Weather is not just the "meat" (Kracauer ix) on which cinema feeds, securing its specificity. Conversely, it turns us, too, into meat, writing our more-than-humanity in atmospheric events of accelerating severity.

Alex Pheby's novel *Mordew* (2020) follows Nathan Treeves, a slum-child in the eponymous city Mordew which is led by the Master, a magician sustaining his magic by slowly devouring God's corpse, which the Master keeps in a void beneath his manse. Nathan enjoys a similar power he barely controls, also acquired from the residual magics leaking from God's cadaver. Nathan is abnormally receptive to God's power which bleeds into the atmospheres above and muds below the city of Mordew, since his parents directly

participated in God's seizure and murder, and furthermore, Nathan's father was a mighty magician, too. Nathan embodies human animals' double ability to advance or burn futurity. As *Mordew* progresses, Nathan discovers and yet ultimately loses control of his powers which negatively impact his companions and accelerate the destruction of the world around him. His exertions turn his body literally translucent as he slowly becomes a disappearing glass-boy, see-through and yet radiating a crystal-blue light. His hubris destroys himself and the earth. Only windblown water diverts from Nathan's inimical trajectory.

Where he stood, the earth crumbled under his feet and fires were set deep down where the roots of plants and trees had dried into tinder [...]. The sea glistened with his light, and at least that seemed immune to him, rolling into shore below the cliff edge and away again as if he was nothing (378).

Weather ignores our self-assumed exceptionality, even when we attempt to exert a range of terraforming powers normally reserved for the divine. Acknowledging meteorological agency leverages radical recalibrations. Earthly life's equity is verified by meteorological indifference.

If meteorological phenomena signify beyond human animals' or cinema's capacities to instrumentalise weatherly semiosis, we must explore weather's sovereign skill to operate cinematically in the absence of anthropogenic paraphernalia. Neither weather *in* cinema nor cinema *as* weather, then, but, fully inverting Meilvang, *weather as* cinema. This is not only a codification of weather's ontological affinities with cinema, but an acknowledgment of weather's creative ability to produce the conditions that cinema is uniquely equipped to capture and without which cinema would fail to operate. Investigating this cine-

meteorological zone is facilitated by cinematic artifacts made with mushrooms' spores. What kind of imagery, then, do the mushrooms at the end of cinema co-build with weather?

MYCOMEDIA

Anna Scime makes spore prints on analogue film. Scime's *Spore Print Film Series* (2010—) is eleven years old and still proliferating, like a radiating mycelial network that occasionally pops into view as mushrooms. Thoughts animating Scime's practice themselves coalesce like mushrooms, sprouting from a subterranean framework of ideas. "The truth is that I'm not entirely sure what made me decide to work with fungi or why I'm so attracted to mushrooms", explains Scime in an interview,

Is it because I'm clumsy and always looking at my feet when I walk? Is it because they can be so colorful and catch the light so majestically on the forest floor or from the surface of a dead tree? Because they're at once so otherworldly and so familiar? Because they are so fleshy at times, and look and even feel like human body parts? Is it because they are our closest taxonomic relatives, ancient inhabitants of the planet, delicious foods and important medicines (with likely many more yet to be discovered), bioremediators, makers of the Earth's first internet, the procedural poets of the natural world...? All I can say is that I've had a keen interest in mushrooms since childhood – first came repulsion, then love... (2022).

How, exactly, does one produce a cinematic spore print? Scime tells us that the

The process for producing the *Spore Print* films is actually really simple. (1) Find clear leader or recycle an old, unwanted film [...]; (2) Prepare the film by laying it out emulsion side up [...], side-by-side on a piece of glass, Plexiglas, or wood (or whatever's available for reuse and offers a sizeable flat surface); (3) Forage for or grow mushrooms; (4) Harvest mushroom when they are ready to release their spores (honorably – never take the first or last one that you see...); (5) Clean, prepare and place mushrooms on the film strips, gills down, and then wait; (6) Remove mushroom matter not fixed to the film after the spore print is produced to satisfaction (eat it if you like); (7) Splice together and collect the film onto a reel, or use the production surface for storage and/or as a display, and cover it to prevent excessive dust collection and premature release of the spores; (8) Project and play the film (and record the process digitally—make digital archive materials) and slowly release the spores from the film (and continue to loop the film for as long as possible); (9) Wish them well and hope that someday the spores create something new, too (Ibid.).

Scime's films include local mushrooms. Consequently, their production is synchronised with mushrooms' seasonal appearance and patterns. Consider *#16* (2016), made by Scime and: bellas; chanterelles; shaggy manes; lions manes; and oyster mushrooms. 3 minutes long, *#16* includes roughly 4000 frames, each bearing its own idiosyncratic print. Mushrooms were laid on rolls of film placed on tables, each a few feet long. At 40 frames per foot, this process required continual repetition. Iterations achieved completion at different speeds as not all fungi share the same timelines for fructification and sporification or thrive in uniform ecologies. Bellas emerge in early spring, whereas shaggy manes appear in waning summer and early autumn, like matsutake. *#16* typifies patience, restraint, and humble attunement to fungal schedules. Only minutes long, *Spore Print* films take months,

sometimes years, to make. Their times of gestation are never determined in advance, rather determined by fungal schedules. They typify a gift manufactured by mushrooms, and given, by Scime, to mushrooms in return, if only because, as vehicles for spores' journey into other environments, they harbour the ability to facilitate the proliferation of more mushrooms.

Scime's methodology produces fairly abstract works, where frames' sequential movement is jarring, not deceptively fluid. Mushrooms shine like cosmic nebulae, dark rings surrounding brilliant cores of white. [Fig. 12, 13] Jittery imagery renders mushrooms visible but never fully amenable to analysis. Since the films are made without cameras, viewpoints are fixed, hovering above the strip. Viewers' proximity to mushrooms is tantalisingly close, never bridged. Fungi are present and reserved, inhabiting distinct lifeworlds that overlap with ours but never entirely align. Scime's spore prints highlight fungal recalcitrance. A key element of Scime's practice is time. We can approach #16 through the concept of laziness. From a capitalist perspective, laziness is a negative condition of slovenly non-production. Alternatively, it is a rebellious momentum helping us partner with beings operating according to different schedules.

'Lazy' relates to other temporalities and attitudes to time—going slow, waiting round, being leisurely, doing nothing—that do not satisfy human-centred, capitalist, productivity-driven approaches. Laziness is a temporal condition with material ramifications, as the lazy person's reluctance to move quickly manifests in a failure of labour, where nothing or little is produced. Scime says, I work "lazily". However, Scime's laziness orbits partial self-effacement, not a lack of effort. Like those of plants, mushrooms' rhythms are at odds with capitalist and, by extension, dominant cinematic rhythms. Mushrooms sporify relatively slowly. Nevertheless, during sporification, mushrooms release billions of spores over a few days, and therefore sporification is actually an intensely frenetic period of biological activity. Yet artistically acquiescing to fungal sovereignty requires becoming a "slow worker", says

Scime. “This works well when you’re telling ecological stories – the bigger pictures and larger stories tend to unfold slowly, too”. Realising the need to methodologically slow down, Scime patiently harmonises with fungal rhythms. Her artwork’s time of gestation aligns with fungal tempos, not the other way round. “The capitalist system in filmmaking demands that everything is done to an end goal of profit or fame”, says filmmaker Philip Hoffman in an interview, “When you remove this equation, what’s left is process” (2022, interview with author). Largely decoupled from capitalist protocols of temporal rapidity and economic goals, Scime’s series is a processual experiment or instance of process cinema as analysed in chapter 1, lacking a definitive terminus and itself echoing fungal sporification. Laziness and love slowly intertwine, as Scime welcomes mushrooms to sporify on analogue stock.

Another key element is labour, manifest in Scime’s harvesting strategies. Scime harvests wild mushrooms from nearby locales. Care was taken to only include non-toxic mushrooms indigenous to areas where works would be screened so not to endanger her viewership or introduce alien mushrooms to ecologies that would be harmed by their introduction. Scime’s foraging expeditions, sometimes producing zero yield, require protracted negotiations with her local milieu, and continually analysing fungal rhythms. For her project’s posterity, Scime had to pick mushrooms in ways encouraging their perpetuity. Respectfully, enhancing rather than curtailing fungal flourishing. Scime might work slowly, but she does not luxuriate in free-time, conversely she labours frenetically across large swathes of time working simultaneously as forager, gardener, and filmmaker, and certainly, in her practice these three disciplines seemingly become somewhat indistinguishable. Furthermore, mycologists regularly use spore prints to identify mushrooms. Spores’ size, shape, dispersal, and colour reveal mushrooms’ characteristics. Consequently, when mycologists make spore prints, mushrooms are generally covered by containers. Chances that spores will fall exclusively downward are acutely multiplied, resulting in images purportedly

mirroring fungal referents. As the mushrooms and spores are alienated from their milieu, atmospheric agencies' inputs are withheld, producing an anaesthetised scenario out-of-kilter with the rhythms of the world. Spore prints reliant on containment deny weatherly artistry and convey an ideal fungality, entrenching human animals' faith in unpolluted individuality. Scime works differently. "It is common practice to cover mushrooms with a jar or container when making spore prints, but I do not. I invite chance here whenever possible. Mushrooms are messy and I like that about them" (Scime). This is a subtle exertion with wide ramifications, not least because it is only through Scime's assent to fungi's reliance on meteorological interventions that we might begin to conduct a cine-meteorological analysis.

Furthermore, with Scime, mushrooms make imagery but also sounds as projectors interpret spores' presence visually and audibly. As different species produce different prints, they may manufacture unique melodies. Where do these vocalisations come from? Spores' physical accumulation on the film strip manifests in audible bumps as the film subtly stutters on its rush through the projector's gate. As spores' direction of travel and location of landing are not simply haphazard but partially intentional, driven by fungal desire and weatherly intervention, we might approach such sounds as a kind of fungal speech activated by weather and film. Additionally, Scime regularly recycles old stock often including extant audiovisual content. Consequently, mushrooms reflect on old works, editing and reanimating formerly defunct stock [Fig. 13].

"I find it simultaneously soothing and troubling", says Scime,

There is an immense amount we don't know about the species that we live amongst, but it's fascinating to think about the translation of sounds and data to a language that we can understand, and to think about the translation of language, sound and other

communicatory data from one species or medium to another. On a formal level the films are presenting mushroom cultures that reveal and speak directly for themselves when played by the projector.

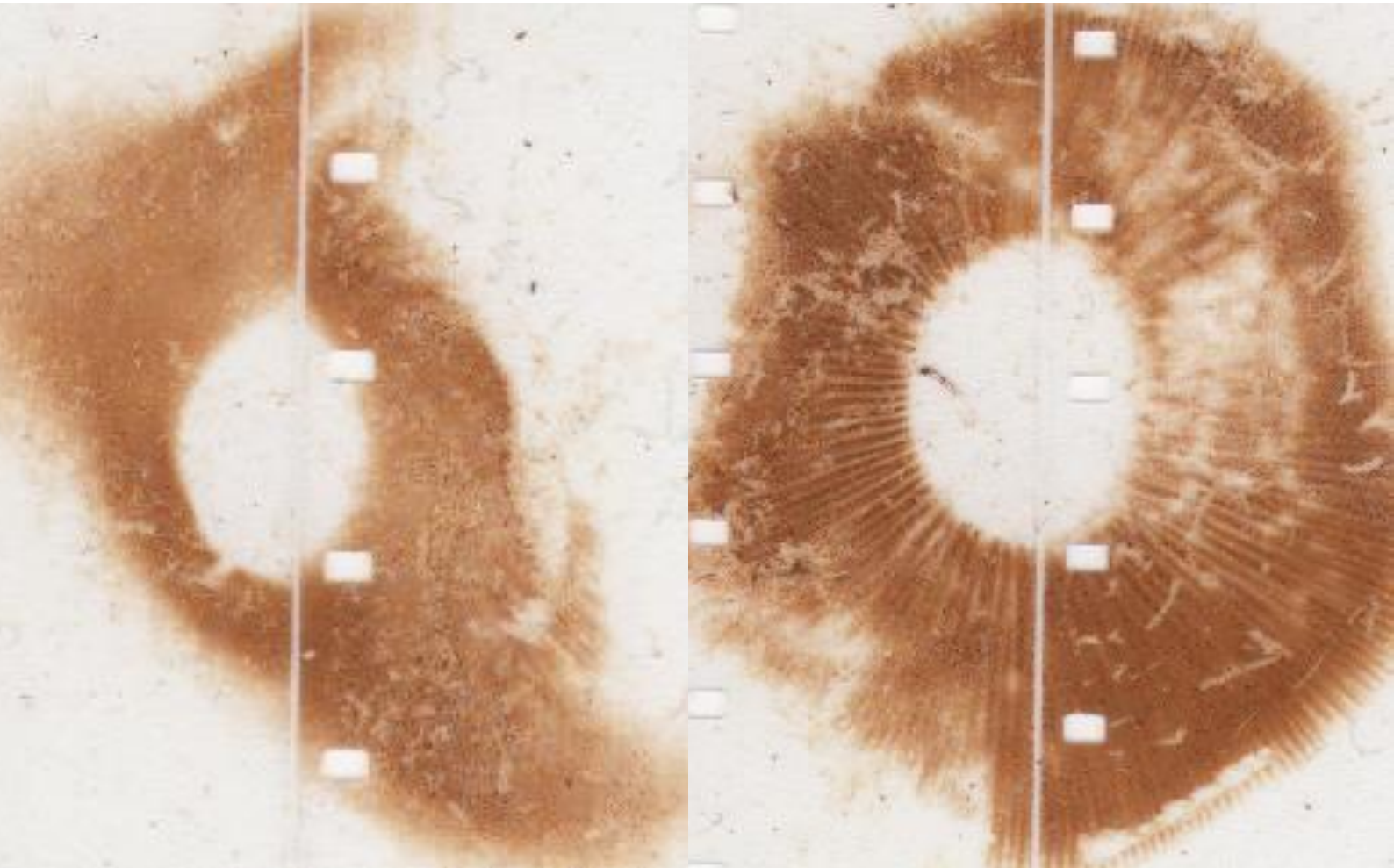


Fig. 12, 13. Scime, #16.
Images courtesy the artist.

Fungal harmonies coagulate live, echoing chittering insects. In collaboration with weather, mushrooms concurrently self-represent and speak, testing our ability to look and listen.

Analogue film's specificity enables multispecies translations, a physical technology of revelatory encounter. Mycomedia highlight fungal and meteorological agency, signifying as non-anthropocentric vehicles into others' worlds.

Scime employs weather as a medium pre- and exceeding cinema, and recalls the views of a previous century, producing meteorological phenomena born(e) by air. *#16* is weathered in various senses. Not only submitted to meteorological exposure's vicissitudes, but literally made by weather. Scime neither fixes prints nor forces spores to adhere, embracing spore prints' precarity. During projection, the film is looped "until it has nearly erased itself and only traces of the spore prints remain" (Scime). Spores dislodge during projection, achieving contact with viewers' clothes and skin, even permeating exposed orifices, perhaps linking up with bacterial colonies in the form of biofilms playing out within some observer's gastrointestinal tract. Spores' rate of removal is determined by numerous environmental variables (humidity, temperature, air pressure and mobility .etc.) and the quality of the physical encounter between projector and film. *#16* is a phenomenological event, something to be inhaled, ingested, and worn, and seen and heard. The projector is itself an audiovisual and weather machine, producing its own climate by generating fluctuations of temperature and electricity, modifying air's local behaviours. Weather is a visible and felt reality despite the auditorium's obligate darkness. This observation applies to all projected media, but *#16* especially, as spores billow around the projector and twinkle in escaping rays of rogue light, animated in the air and visible in the illumination cast by the projector's bulb. Local atmospheres transform into media of dispersal and exhibition and various screens emerge during projection. First, the traditional screen, where Scime targets the projector's beam. Then, an atmospheric screen, through which spores are animated, mobilised, and rendered visible, lit up by the projector's bulb. This atmospheric screen literally appears between the audience and the wall-mounted canvas. It is therefore perceived first, literally

and metaphorically typifying atmospheric media's fundamental originality regarding the production, exhibition, and reception of cinematic art. *#16*, looped until devoid of spores, slowly changes. As Scime explains,

The larger idea or story is revealed and kinetic forces disperse the spores during projection—at once accentuating and de-saturating the films' colors, shapes and sounds. These colors, shapes, and sounds are only palpable, like the spores themselves and the stories and ideas told within the film frames, when experienced en masse. Encountering the films in exhibition adds new layers of interaction and exchange. Anyone present at a screening will get to see the spores coming off of the film as they float by the projector's light beam (and machine's light leaks) and into the air. They'll hear and see the less subtle changes in a more visceral way, too. They might inhale the spores or collect them on their bodies.

Atmospheric mobility is an itinerant conduit of creativity. Spores do not disappear following severance. Nor does *#16* degrade, conversely, it indefinitely grows, as Scime tells us, "The projector reveals not only a new way of seeing the films, but also creates new films as it slowly releases the spores while they play. So, first I produce one film by placing the mushrooms, then the projector makes another... and there is potential beyond" (Ibid.). Projection is not an end but a generative component of Scime's methodology. After release, spores produce novel patterns against architectural surfaces and human animals' bodies, and in the air. Weather scours the strip only to project its content elsewhere, and within its own gaseous body.



Fig. 14. Scime, #17 (2016).

In this image, from Scime's #17, a mushroom releases its spores on recycled stock, reflecting on extant imagery. Hairs and other elements mark the strip, which, in conjunction with the former imagery's yellowed quality, indicates its age.

We can make out the ghostly gill pattern, in sumptuous, textural pink.

These patterns form connected parts of an expanding spore print, facilitated by meteorological intervention. This flow of spores calls us to contemplate the permeability of the boundaries between our body, and the body of the film and the body of the earth, possibly even their non-existence.

Viewers are subsumed by a spontaneous event of elongated sporification. Their epidermises and interior cavities, populated by worn or inhaled spores, ontologically harmonise with local masonry, ubiquitously amenable to weather's caress and spore prints' production. A multispecies exhibition ecology spontaneously erupts as air wreathes around human animals and spore laden stock without discretion, a newly perceptible vehicle of horizontalising entanglement. Scime highlights weatherly creativity besides its ability to breach the arbitrary division of world and screen, human animal and earth. Fungi, human animals, and meteorological phenomena conspire to make the film and collectively engineer its dilation, verifying the varied powers of all three to precede and exceed cinema. Intermittently visible in the projector's leaking light and radiant beam, spores appear animate whilst dancing in the air. The physicality of weather's usually nebulous materiality is rendered palpable by fungal material swirling within it, simultaneously medium of art and screen of exhibition. To think of weather as embodied is unconventional, and by doing so I am trying to articulate weather's *thereness*, its ability to be impacted and impactful. The auditorium's local atmosphere operates like a film strip, as mushrooms' spores are therein spatially re-arranged and made to move in time. Weather exhibits its cinematographic identity, writing with spores in mobility, time, and light.

In contrast to Scime, Madge Evers makes spore prints on paper, not photochemical film. Evers generally produces one original, and some copies. These are ontologically distinct. "The original is fragile, experimental, and possibly fugitive; I don't know what it will be in ten years (although original spore prints from 2015 are intact, with small numbers

of spores flaking off”, Evers says in an interview, “Originals are almost sculptural and more special than reproductions, although reproductions are lovely, too” (2022a, interview with author). I address originals. Neither technically painting, nor photo- nor cinematography, Evers’s prints elude categorisation, requesting expanded concepts of art, specifically cinema. Present vocabularies fail when deciphering Evers’s prints, mainly because Evers injects motion into singular, and thereby purportedly static, images. Evers plays with mushrooms in an uneasy borderland between stasis and momentum, an interlocutor between cinema, the other arts, and the cinematic artistry of life itself. Playing with spores in time, Evers makes images of motion that barely move, breaching boundaries with mushrooms and weather.

Evers’s practice is presupposed by humble reticence before fungi. This disposition was learned. An avid gardener, Evers initially explored fungi as an agricultural test and food, an experiment in home growing and slow eating. Spore prints were an artistic supplement, as Evers explains,

My partner and I occasionally forage for mushrooms, and I have always been excited with the prospect of eating food from the forest. [...] In April of 2015, I cultivated two beds of mushrooms in my shady yard. [...] I kept the beds well-watered for the first several weeks, followed by regular watering. In the fall of that year, mushrooms began to fruit. When the mushrooms first emerged, their dome shape did not lend itself to spore printing. When the caps began to unfurl, I harvested them, then made a spore print. [...] That abundance of mushrooms, so near to my door, prompted the experimentation from which my recent work evolved.

But the experiment failed. Evers's beds laid empty as fungi exercised their sovereign capriciousness. However, Evers's horticultural failure introduces another element of spore printing, namely any outcome's or artwork's experimental significance. The successful manifestation of spore prints is fascinating, but so is their non-appearance, because even 'failure' verifies fungal recalcitrance. Consequently, in the context of experimentation, 'failure', like 'disturbance', enjoys a curious ambivalence insofar as a 'failure' might actually open on to new insights and perspectives, thereby becoming, more specifically, an unforeseen result capable of triggering onwards inquiries, in short, an alternative type of success. Evers tells us that her

attempts to control a seasonal supply of that species was short-lived. I don't know if the mycelium grew tired of my human demand for more, or simply became sensitive to the needs of plants in my garden and made way for other species to thrive. They stopped producing. I gave up on cultivation and turned to mutually flourishing companions, honing my gardener's eye as I walked through neighbourhoods and woods. When I abandoned domestication, I came to understand my role in an interspecies relationship with fungi. Like the wind, and other animals, I spread the spores of mushrooms, an organism that operates with intention and design. I germinate those powdery spores into a fruiting body that takes the form not of a toadstool, but of a two-dimensional image on paper.

Instead of reinstating her mastery, Evers followed, adapting her practice in line with fungal instructions. Mushrooms seeded new perspectives about what mushrooms, and human animals, are and can be, alone but also together. Evers's spore prints derive from lived

acquiescence to fungal sovereignty. Yet Evers exerts herself during production, explaining that “I impose myself on the work in various ways: My choice of materials and the place from where I got them. Then, the placement of plants and mushrooms on paper as well as the amount of time I leave the mushrooms to release their spores all impact the work”. This is key. Evers’s artworks coalesce when human animals and fungi respectfully intertwine, mycomedia of multispecies co-worlding. Mycomedia signal the fecundity of respectfully attuning oneself to others’ rhythms. Echoing Scime, Evers’s methodology comprises slowing down, acquiescing to fungal schedules.

The seasonal aspect of my work creates some freneticism as I feel a need to work on many ideas in the limited time in which I have access to mushrooms and plants.

However, the processes of spore printing cannot be rushed, so there is a letting go that happens when my materials are assembled and the mushrooms are releasing their spores. I wait for 8, 12, or more hours. It is always exciting to lift the cap and see what happened while I was away. And humbling when nothing does.

Evers makes room for others by creatively withdrawing. Evers’s spore prints appear when human animals retreat, yet never to the point of total absence, and showcase how to engage in mutually aggrandising regimes of disturbance.

Evers brings this triptych of chapters full circle. Evers bundles her work into series, calling one ‘The New Herbarium’, as she described in her article on this series, ‘The new herbarium’ (2022b). As mentioned in chapter 3, herbaria are museological phenomena assuming literary or architectural forms. Herbaria may be books, gardens, or museums containing plants. Herbaria preserve plants to facilitate scientific analyses and taxonomic

documentation. Like all other classificatory institutions, herbaria require and imply a central entity adjudicating on their groupings and tirelessly patrolling their increasingly porous borders. Moreover, plants and mushrooms, like all early beings, are surrounded by an earthly hubbub that obfuscates scientific seeing, hence why mycologists prefer to isolate sporifying mushrooms with a container, in order to silence the vibrant, material vortexes at the heart of which mushrooms thrive. Like the scientific act of spore printing, herbaria operate via exclusion and isolation, ingesting beings after extracting them from indigenous milieus. Severance operates materially and linguistically. As Evers explains, “One aspect of ‘old’ herbaria I would like to move away from is the use of Linnean terms for flora. I understand that the Latin names are super useful, but I live in North America and would like to see a classification system based on languages indigenous to North America” (2022a). Herbaria require the systematic organisation of the world, tailored to the perspective of a monolithic, ideal subjectivity, usually a western male. Furthermore, western herbaria invalidate and appropriate plants’ and fungi’s roles in Indigenous cosmologies, besides their sovereign right to not be deracinated. Beings are transported elsewhere and clothed in a new language, indicative of the exercise of colonial power. Consequently, herbaria, as mentioned in chapter 3, coincide with zoos, sharing shared objectives and points of origin. Beings’ extraction and incarceration signifies the extractor’s dominion over their indigenous landscapes. Herbaria derive from and reciprocally feed anthropocentric imaginations. However, Scime and Evers both pick mushrooms, so how does their practice differ? Picking mushrooms can actively support fungal cycles of dispersal and reproduction, depending on how it is done and what one does with the mushroom’s body and spores, and consequently, picking whole mushrooms is not automatically violent. When extraction is performed with care, mycelia will remain unharmed, capable of making more mushrooms. Mushrooms are designed to be extracted and eaten by mammals, whose bodies and patterns of excretion are co-opted to achieve dispersal.

Furthermore, Evers's work is also different because, as she tells us,

The New Herbarium combines plants and fungi to create imagery that depicts the familiar shapes of plants in silhouette. The use of mushroom spores speaks to mycorrhiza, the hidden relationship between the two kingdoms, and each kingdom's mysterious powers. [...] Implicit in my herbaria work are ideas about our connection with and duty to other species (2022a).

The gaps between old and new herbaria are epistemological, not temporal, concerning knowledge, not time. Old herbaria are contemporaneously active, as are new ones, yet incipiently. Like Scime, Evers does not contain mushrooms when spore printing, welcoming meteorological interventions. Evers's *Luminous Herbarium* (2019) includes: chervil; echinacea; and yarrow; alongside bioluminescent jack o'lantern mushrooms [Fig. 15]. Vegetal silhouettes appear across the page, back-lit by clouds of white, and the occasional mushroom. The image is black-and-white, heightening the jack o'lantern's spores' luminescence, dazzlingly bright against a black horizon. As air coiled around sporifying mushrooms, spores blew across the page, leaving halflit trails. Spontaneity lives in the work, embraced as an ineluctable fact of shared and vibrant living. Indexing fungal and weatherly collaborations, spores' mobility scans as hazy clouds flowing across the imagery and amidst inverted mushrooms, like curtains of moonlit rain, or rivers of smoke coursing through fungal archipelagos. Plants register as silhouettes, unassimilable even in their appearance. These shadowy traces signal places where spores were unable to fall. In these artworks, fungi highlight and intensify plants' recalcitrance.

In the work, mobile air links disparate beings, registering as a synthesising force and conduit of connection. Plants and fungi may only reproduce and establish shared communities via intervening media provided by local atmospheres. Ecologies only exist within atmospheres, elemental media of fungal and vegetal communication, nourishment, and propagation. We, too, rely on atmospheric media, whose absence would precipitate immediate asphyxiation. Spore prints are symptomatic of such dependencies, as mushrooms' birth and spores' journeys, like the light shot from the cinematic projector towards the screen of exhibition, require meteorological intervention. In the *Luminous Herbarium*, atmospheric energy is acknowledged as a key facilitator of earthly life, and methodologically facilitates the artwork's production. Loaded with spores, these smoky rivers also visibly honour fungi's ecosystem functions, as living highways linking spatially disparate beings.

Furthermore, the *Luminous Herbarium* is compostable. Composting does not precipitate the artwork's destruction but further stages of progression. This observation typifies another point of contact between biofilms and mycomedia. Evers's work's precarity is not a negative condition but an exciting chance of spontaneous genesis. If discarded underground, mushrooms may sprout from its surface. Evers's artifact supplies a representational medium and a literal, biological medium of fungal growth. Vitality, spores are not blocked the ability to decouple from the page. Evers's spore prints are inherently unstable, artworks are processual phenomena lacking a definitive terminus. Made slow and only once, Evers takes almost nothing whilst provisionally giving all of it back. Moreover, picking mushrooms to transport them elsewhere, Evers participates in fungal reproduction. This injects her artwork into the cyclical procedures of fungal regeneration, an alternate fruiting body.

Originals are inherently cinematic, beholden to spontaneity and transiency. Endlessly radiating spores, even facilitating mushrooms' reproduction, the *Luminous Herbarium* is

interminably mobile. This motion, exercised or latent, transforms static images into moving ones. This is cinema slowed down, dilated to an unbearable maximum, where movement transpires over years, not seconds. Tangible progression and genesis is not marked by stuttering frames, but spores' gradual, constant release from the page. A limit case of cinema, the *Luminous Herbarium* inhabits the confluence of anthropic, mycological, cinematic, meteorological, and vegetal time. Evers pioneers a cameraless long exposure cinematography. Mushrooms' spores, riding windblown air, sweep across paper, accruing depth against ostensibly two-dimensional surfaces [Fig. 16, 17]. Working on paper and taking spores as its medium, weather makes cinematic art. Producing a contact print on paper, weather also makes a cinematic event coalescing before cinematic paraphernalia's arrival. The *Luminous Herbarium* invokes weather as artistic medium and medium of art, a springboard for thinking weather as cinema besides the possibility of *cinematic* encounters beyond *cinema*. Evers's prints are dense images apropos to a thick present, derivative of a cinema boiled down to its constituent elements of movement and time. Evers brings us to the limit of thinking cinematically, and on the verge or shores of this exciting realisation, we might look around to acknowledge a sheer abundancy of biosemiotically proficient bacteria, fungi, and vegetation, all of whom grope, grasp, and reach out to us in a shared, multispecies vocabulary enunciated and received through the cinematic dynamics of movement and time.

Now, we reach, perhaps, the logical endpoint of cinema's reracination. Not only returning cinema to the ground that subtends it, in the sense of acknowledging cinema's extractivist dimension. But acknowledging that ground's cinematic power, the semiotic proficiencies of those more-than-human elements and beings that get *re-presented* in cinematic art, and make meaning by moving in time before cameras' arrival. Nevertheless, neither work describes serene alternatives to dominant expressions. Film used includes gelatin. Mushrooms are harvested to enable production. However, Scime recycles old,

gelatin-based stock, redirecting violent flows towards less violent ends. Neither artist entirely fixes their work nor forces spores' adherence. Both artifacts operate as media of fungal dispersal, not least because, in Scime's case, friction generated during projection accelerates spores' removal from the strip. Both showcase how to more sustainably work through cinema's voracious appetite for earthly ecologies, and thematically explore others' sovereignty. They teach how to modify process to mitigate cinema's tendency to, as Pick says, "feed on the world" (2021).

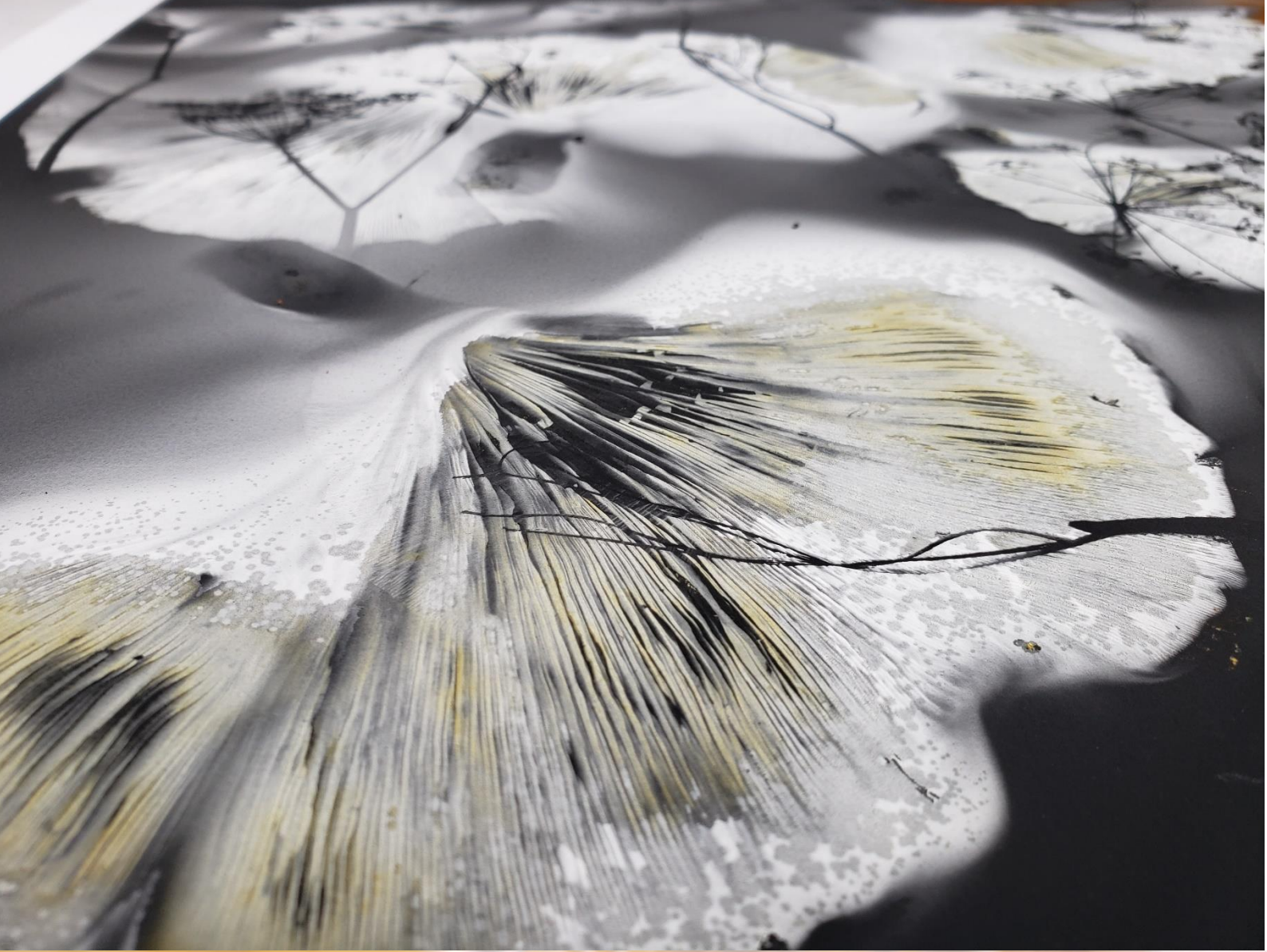
Through them, cinema does more than cultivate new ways of looking at the world. It lends itself to others' systems of reproduction and expression, becoming particularly valuable when such beings communicate in non-verbal, embodied registers. Yet mycomedia are less bridges, more junctions. Though co-built by fungi, mycomedia do not only precipitate fungosemiosis's comprehension. Imbued with their maker's energies, they network like mycelia, encouraging acknowledgment of, for example, meteorological sovereignty.

Evoking the fungal anatomy, mycomedia always point away from themselves, far beyond the frame. Mycomedia signify an altered sociality, arising within fugitive encounters. Mycomedia sprout amidst multispecies precarity, echoing mushrooms after rain.



On previous page: Fig. 15. Evers, *Luminous Herbarium*.

Image courtesy the artist.



On previous page: Fig. 16, 17. Evers, *Carry a Torch* (2021).

Images courtesy the artist.

In these two, highly textural images, not from Evers's Luminous Herbarium but Evers's Carry a Torch, we get a sense of spores' mobility and interaction with the elements, as they streak across the page, producing lines and rendering plants in silhouette. The full artwork (Carry a Torch) is represented below.



Fig. 18. Evers, *Carry a Torch*.

Image courtesy the artist.

REFUGIA

With—and like—us, cinema may obliterate or remediate ecologies. Tackling this conundrum, I have analysed artifacts where cinema’s largely latent, but evidently available, ability to trigger life’s proliferation is activated. These artworks evidence anthropic filmmakers’ capacities to practice material restraint, making in hyper-local contexts with available means, abiding by decelerated speeds, even synchronising to others’ schedules. Dependent on, and exemplary of, fungal and atmospheric artistry, the mycomedia I have elected to investigate reinvigorate cinema’s designation as a medium, a bridge between worlds. I have named them mycomedia to honour fungi’s critical role in their creation and linguistically expand ideas of what media are. Moreover, mycomedia applies Stamets’s mycoremediation to the cinematic realm. Not only harbouring mushrooms’ spores, these artworks showcase how to make and live with others amidst ongoing and intensifying environmental catastrophe. Ruderal vectors of material and thematic remediation, they heal environments by literally facilitating onwards radiations of life, and engendering more environmentally sustainable outlooks and behaviours.

My analyses invite us to approach mycomedia as “refugia” (Tsing 2017: 54), environmental safehouses amenable to resurgences of diversity. In ‘A Threat to Holocene Resurgence is a Threat to Livability’ (2017), Tsing explores refugia, “spaces where those species wiped out elsewhere continued to thrive” (54). The climate crisis is largely defined by present and forthcoming extinctions. The Holocene (our currently official epoch, nearly twelve millennia old) roughly began in 9700 BCE, and it has

always included extinctions. During the Holocene, human animals spread across the globe, altering landscapes by developing tools and domesticating various plants and more-than-human animals, and allying with bacteria, fungi, and protista in novel assemblages. The Holocene can be approached as the hospitable context in which environmental conditions amenable to human animals' mass stabilisation and rapid proliferation emerged. Conversely, the Anthropocene (our speculative present epoch, not yet official) is the epoch where these conditions are rapidly ceasing to exist following human animals' transformation into a decisive force regarding the planet's climate. Human animals' current behaviours are making marks that could be stratigraphically legible in the geological strata of the future, and whether or not (and how) activities leave residual inscriptions in the geological archive are key criteria for determining and legitimising epochal shifts. Possible markers include 'technofossils', the material dregs and remnants of our technological inventions: micro-plastics, or the metals inside our smartphones. Alternative markers pertain to biodiversity, one example being the emergence of broiler chickens as the most populous vertebrate on earth, over 23 billion alive at a time. What will future geologists read into such sediments of zoo- and biocide, carved into the material archive of the planet's strata through the glacial geophysics of time?

For Tsing, Holocene ecologies are characterised by their ability to fan out from refugia, resurging after disturbance. Conversely, contemporary ecologies lack a capacity to bounce back after disturbance. As Tsing explains, Holocene and Anthropocene ecologies currently co-exist, and most likely always have. Their distinction does not suggest a linear chronology or sequence of events, but a set of interpenetrating and diverging pathways concerning how we might take part in securing or eviscerating the future of life on earth. To secure livability, we need to acknowledge

how Holocene ecologies function, and seek to assist in their proliferation (2017: 54). Livability remains available, yet beating fast retreat. Refugia are extant, but rapidly diminishing. Rebuilding despite ruination requires uncovering refugia, tapping into beings' abilities to collectively co-build multispecies futures. I apply this to cinema by construing mycomedia as 'cinerefugia', literal and metaphorical ecologies enabling multispecies resurgence. Cinerefugia do not exclusively facilitate plants' and fungi's material proliferation (although, as my case studies show, they definitely can). By contrast, they champion non-anthropocentric views and more sustainable social, ecological, and cinematic processes, sensitively engineering the creative recombination of human and more-than-human desires, advancing livability's terms. Regarding contemporary artists working with mushrooms on analogue film and paper, the production of cinerefugia is no methodological fantasy or imaginary quirk, it is an extant modality.

To articulate this chapter's case studies' significance regarding cinema's material and conceptual conclusion, I must revisit Germaine Dulac, Jean Epstein and Jakob von Uexküll, analysed in chapter 2. Why? Because, through pure cinema and photogénie, Dulac and Epstein provide us with a means by which we might distinguish between the *cinema* and the *cinematic*, whilst Uexküll, through biosemiotics, offers a framework to contemplate living beings' ability to make meaning whilst moving in time as cinematic. We can begin this analysis in 1923, when Epstein travelled to Sicily to record Mount Etna's eruption, bringing a film crew and some muleteers. Although the film was not preserved, what survives is Epstein's article, 'The Cinema Seen from Etna', the first chapter of Epstein's eponymous book, published in 1926. This reveals how Epstein navigated his Umwelt, a world overloaded with meaning. "Sicily!", Epstein begins,

The night had a thousand eyes. All sorts of smells shrieked at once. An unfurled coil of wire brought our car, swathed in moonlight as if surrounded by a mosquito netting, to a halt. It was hot. Impatient, the drivers broke off singing the most beautiful love song, striking the car with a monkey wrench and insulting Christ and his mother with a blind faith in their efficacy. In front of us: Etna, the great actor who bursts onto the stage two or three times each century, whose tragic extravagancies I had arrived to film. An entire side of the mountain was a blazing spectacle. The conflagration reached up to the reddened corners of the sky. From a distance of twenty kilometres, the rumbling at times seemed to be a triumphal reception heard from afar, as if a thousand hands were applauding an immense ovation. What tragedian in what theater ever knew such a thunderous success? (2012/1926: 287-288).

The night was bursting with life. A thousand eyes look back. A plenitude of voices yell into the dark. An olfactory symphony of scents clamour at once. Human animals constitute one note in this massive melody. Even then, their locutions are modulated through a monkey wrench as it chimes with a car's metallic body.

For Epstein, I think, the volcanic eruption literally registered as a film, a moving spectacle of biosemiotic exhibition, a cinematic event *par excellence*. Equally impacted by meteorological phenomena, human animals were incorporated into this cinematic scenario, rendered equitable with every local element. Rapidly mobile and super-heated air, populated by ash and dust, scanned as media of dispersal and exhibition, as medium of art and artistic medium, in manners comparable to analogue film. Newly mobile phenomena were shockingly uncanny, illuminated by Etna's intermittently flashing vent. I imagine the volcano as a massive camera, each sulphuric burp or expulsion manifesting as a snapshot of a

cinematic event underway in the twinned dimensions of time and motion. The materials of production the material of life itself. Etna's power not only exudes, but exceeds, cinema's. "Glorious volcano!" Epstein exults, "I have never seen expressions comparable to yours" (288). It is serendipitous that Epstein's recording perished for it would have described a diminutive version of a cinematic event primarily executed by meteorological and geological power. "What churches", Epstein waxes, "if only we knew how to construct them, could accommodate a spectacle like this, where *life itself* is revealed" (289; emphasis added). On Etna's scorched and superheated slopes, Epstein seemingly found that towards which he was groping with words like photogénie, a pure cinema made of nothing but "movement and rhythm", comprising only "*La Matière-vie elle-même*" (the material of life itself)" (Williams 2014: 153; emphasis in original). "I don't know if I can make myself understood about this," Epstein says, "but the figure with whom we were all occupied was the cinema" (289). Etna's eruption evidenced an elemental artistry enjoyable without anthropogenic media, operative with smoke, ash, and fire, a form of cinema so unfiltered and pure as to be enjoyable without the cinema's presence; exclusively enjoyable, that is, in the realm of the cinematic. Photogénie, explored on this frontier, typifies a radically non-anthropocentric approach to analysing audiovisual artefacts, where anthropogenic media are secondary to, and fed by, photogenic beings' ability to make cinematic art. Epstein invites us to contemplate cinema as an ancillary symptom of more-than-human expression. In this regard, Epstein's book's title is a giveaway, the cinema (industry) seen from Etna, an exemplary agent or actor in the context of the cinematic realm.

Scime's and Evers's prints, and Scime's projection scenario, co-exist on a continuum alongside Etna's eruption, made by weather writing with spores (instead of ash) in movement and time. Through Epstein, mycomedia introduce us to meteorography as a concept and modality of weatherly expression. Cinema shares with weather an unbiased disposition and,

in its analogue form, lends itself to fungal and weatherly styles of address. Additionally, the identities of weather and cinema align, mutually defined by mobility rendered in time. As already referenced in chapter 2, cinema is the “superb conciliation of the Rhythms of Space (the Plastic Arts) and the Rhythms of Time (Music and Poetry)”, writes Riccioto Canudo in 1911 (1988: 59). Cinema includes only two primary ingredients, time and movement. To ‘make’ a film, light is unnecessary, depending on the materials used to render imagery and the effects filmmakers hope to achieve, although we do need light to watch a film (and, for that matter, a cinematic event). Neither are cameras automatically requisite. Equipment and techniques construed as essential are extraneous. Cinematic events are simply ones where things transition from stasis to momentum and mobility becomes appreciable in development across time. The concept that more-than-human mobility only becomes cinematic after being modulated by the apparatus is attributable to the parochialism of human animals’ vision. Living beings’ significant mobility precedes cameras’ appearance, which, saying nothing of digitally rendered media, may only ingest events already underway.

Cinematic paraphernalia do not produce moving images *ex nihilo*, rather ingesting and *re-presenting* beings’ ability to communicate meaning through motion. Living beings’ mobility is frequently precipitated by weather, which produces cinematic events lending themselves to audiovisual appreciation, and, more fundamentally, produces the atmospheric conditions required for life to originate and persist. Mycomedia hover between various forms of art and evade classification, enjoying, like weather, an elemental fluidity. Mycomedia may be construed as meteorograms primarily speaking to neither photo- nor cinematography but meteorography, made by weather writing with mushrooms’ spores in mobility, time, and in #16, light. This double designation as mycomedia/meteorogram typifies such artworks’ mutual reliance on fungal and weatherly inputs. Meteorography is not just a formalisation of weather’s semio- and cinematic proficiencies. Generally, artists capture then overcode

weatherly power. Yet prior to cinematography comes meteorography. Meteorography flips directions of capture, calling cinema an outlet of meteorological creativity and denying our exceptionality for we, like cinema, are equally submissive to atmospheric authority, media for its expression.

My objectives in this chapter have been fourfold: to explore how mushrooms exemplify more sustainable ways of living and making cinematic art; to take stock of mushrooms' historical and contemporary cultural importance; to analyse some mycomedia made by human animals welcoming mushrooms and weather as co-creators; and to explore cinema's conceptual and literal end. This final objective is a point towards which this whole thesis has been leading, even as it leads towards a conclusion I am unsure as to how to deal with. Must we abandon or seek to save cinema, given its almost certain finitude and terrible environmental impact? What are we to do with this broken (and breaking) medium, in respect of the exigencies of the climate crisis and our paralysing lack of time? I face such questions head-on in chapter 7, my conclusion.

And although I yet lack satisfactory answers, I believe that mycomedia may introduce one kind of solution. Mycomedia invite us to attune ourselves to the possibility of *cinematic* experiences that are not *cinema*, heightening our receptivity to earthly life's semiotic proficiencies. Cinema's industrial extinction is no fantasy. Rapid environmental decline will precipitate human animals' and cinema's literal starvation unless structural changes occur, which is unlikely. The artists I have analysed help navigate the conundrums of cinema's use value in respect of its shameful history and arguably unjustifiable present and future. Particularly Scime's methodology speaks to anxieties about industrial cinema production's environmental impact. These spore prints thereby invite us to explore a future where cinema no longer exists. The near

certainty of cinema's and human animals' collective finitude urgently calls us to investigate other ways of enjoying cinematic experiences. Furthermore, to appreciate other beings' cinematic qualities is to acknowledge their subjectivity, as beings' cinematic powers coincide with biosemiotic locutions. These acknowledgments might leverage new paradigms of care, helping us, and cinema, find ways of surviving with others on a damaged earth. It may also be too late. In this scenario, acknowledging others' cinematic powers will help us receive some of the enjoyments we associate with cinema after it has gone, engineering deeper forms of connection between human and more-than-human life. To attribute cinematic capacities to more-than-human others elevates both living beings and the cinema at the point of their mutual entanglement, offering a launchpad for further inquiry into human, more-than-human, and cinema's non-exceptional existence on the continuum of earthbound creative expression. If life operates cinematically prior to anthropogenic paraphernalia's arrival, living beings ubiquitously enjoy a cinematic power preceding and exceeding the act of filming, and from this we might draw comfort. The cinema will live on, and outlive us, via living beings' and forces' semiotic abundancies. "When I think of the word cinema", says filmmaker Alex MacKenzie in an interview,

I think first of a meeting space where there is a collective experience that affects each individual differently but maintains a common thread that reaches us all...

That said, if cinema needs to be sacrificed in order for there to be a 'two hundred years from now', I am okay with that too. I think if we can collectively watch the sun rise and fall and learn to appreciate that more, then a direct relationship with the world might be a better way to go (2022).

Karel Doing says something similar, arguing that “Motion is not only written on a filmstrip . . . a snake slithering through sand is doing something very similar” (2022, interview with author). When we can appreciate the snake’s body weaving through the grass, capturing and diffracting the dappled sunlight as it falls, broken and patchy, through a vegetal canopy above, perhaps even tumbling over a bulbous mushroom’s pileus and cap as it does so: what need have we for cinema?

I further investigate cinema’s obsolescence and redundancy in my conclusion, where I propose the provisionally unachievable aspiration of a non-violent cinema alongside the practical framework of cineremediation. First, however, I explore some interviews with various artists, scholars, and activists. I clarify my perspective on cinema by exploring various views and artworks from beyond western contexts.

§ 6

***NEW
GROWTH***

Listen and the answers ring clearly.

(Phil Hoffman 2022, interview with author)

I have become increasingly sensitive to issues in my PhD. I address Indigenous knowledge, yet virtually all key films are by European or north American westerners. Consequently, I have contributed to certain artists' marginalisation and entrenched the biases I have worked to dismantle, methodologically supporting the systems I hoped to destabilise, doing what I critique many films for: my arguments and content have not been corroborated processually.

In order to tackle such shortcomings, I have conducted interviews with many artists, activists, and scholars. I include all of these interviews in this chapter. Through them, I tried to learn about others' worldviews and how cinema operates in non-European cultures. These conversations helped reveal how cinema's environmental and social impacts may be ameliorated, for example, by preserving Indigenous practices pertinent to producing abundant ecosystems. Furthermore, exploring new films and artists forced me to specify the links binding this new corpus of films with my original case studies, ultimately deepening my understanding of both media sets. Many of the artworks, such as Fradique's *Ar Condicionado /Air Conditioner* (2020) and Truong Minh Quý's *The Tree House* (2019), I analyse in this chapter include digital technology and anthropic figuration. In comparison to, for example, Karel Doing's *The Mulch Spider's Dream*, they replicate a human animal's perspective and tell stories primarily pertinent to anthropic experience. How can I discuss such disparate media in one document? What commonalities do my case studies share even as they differ?

This chapter is far shorter, really a series of brief reflections, each of which introduces a specific vector of connection conjoining my case studies, such as how my case studies' filmmakers generally produce their films as part or for the benefit of local communities, often operating in grassroots contexts to do so. I confer on my interviewees the highest accolades by conceiving of them and their work as new growth, willfully emerging from extant stems; or mushrooms, sprouting from underground mycelia; or bacteria, restyling extant media for new ends. These conversations speak to things already discussed, yet take me elsewhere. Like

a plant, they may look familiar and quotidian, then suddenly flower into something exciting and new.

In my previous chapters, I've employed the interviews I have conducted with key artists as paratexts. Now, I draw on them in greater depth to extract and investigate the key similarities between their thoughts, films, and approaches to filmmaking. I begin with cinema's multifaceted ontology, taking stock of its multiplicity.

MULTIPLICITY

“When I look only on the surface”, Doing says, “plants are quite boring and repetitive. But when I look closer, a world of variation and meaning opens up” (2022, interview with author). Like plants, upon closer analysis cinema is startlingly multiple. As Doing says, “Cinema can never be one medium. It is already multiple things at the same time” (Ibid.).

Anna Scime contends that

Cinema is many things: it's a language written in motion and light, a landscape, a container or skin, a time-image and a movement-image, a memory, a collective dream, a place, an idea, a lot more... It's a vehicle for creating meaning and exploring different ways of being in the world (2022, interview with author).

There are many ways of making and sharing cinematic media, and putting cinema to work.

Cinema's multiplicity also addresses anthropogenic media's receptivity to others' styles of writing, and an expressive power of life exercised regardless of anthropic intervention. We are not exceptional in our ability to produce cinematic art. As explored in chapter 5, we can distinguish between the *cinema* (industry) and the *cinematic* (life's general expressivity). Every living being enjoys a cinematic power, signifying whilst moving in time. When various beings move together, blown by wind, cinema happens. Flicking tails or bending leaves are profoundly cinematic gestures. Cinema is the thirsty plant, the cascading ray of sun, the light splashed on the dark canvas. Cinema is an industrial technology *and* an energy possessed by all life that may be seized, co-opted, and redirected, or acknowledged, respected, and partnered with, or not even filmed at all, simply enjoyed through the biosemiotic locutions of plants and other living beings and forces.

Key filmmakers positively respond to cinema's multiplicity, exploring cinema as a vehicle by which others' worlds and styles of communication can be understood, if only partially, by devising methods of relaying and honouring different experiential regimes, human or more-than-human.

COMMUNITY

Many key artists operate in artist-led, community-oriented collectives. Alex MacKenzie is part of Vancouver's Iris Film Collective, which champions art objects made with physical film. For MacKenzie, community-based making infuses process with purpose and novelty. It

checks artists' egos, promoting learned sensitivity to other ways of life, cultivating a willingness to act with others' in mind.

“I think collaboration is a way to keep things lively”, says MacKenzie,

to maintain conversations, and to remind oneself that there are so many other views and potential outside of what we already know. While I largely work on my films solo, the community around those films and the environments they inhabit feel like the collaborative aspects of bringing them into the world. The conversation between and around works gives them life. If experimental cinema can be a selfless act that attempts to free itself from ego and navel gazing as well as repetition and rehash, then I have faith that these aspects can move toward a less destructive cinema (2022, interview with author).

MacKenzie's views coincide with Jorge Cohen's, co-founder of Geração 80, a collective based in Luanda, Angola. Cohen produced *Ar Condicionado/Air Conditioner*, directed by Geração 80's Fradique. *Ar Condicionado* follows Zezinha (Filomena Manuel), a maid, and Matacedo (José Kiteculo), a guard, who, after air conditioners begin mysteriously falling from Luandan tenements, are dispatched by their boss to find a replacement. *Ar Condicionado* explores squashed and manufactured memories, dominant narratives and counter-archives, inter-generational communication, alternate cartographies of space, and real people rendered transparent by political and artistic repression. A neon-lit dream voyage into Luanda's tentacular sprawl of high-rises and alleyways, *Ar Condicionado* celebrates stories and people regularly overlooked by mainstream Angolan media.

“This film is a resistance”, Cohen explains (2022, interview with author). *Ar Condicionado* is a rebellion, an affirmation of relevancy, a declaration of autonomy. “Why do you want to make this movie?”, Cohen rhetorically wonders. “Because we do!”. Geração 80 explore and activate ways of telling stories in their own voice and for themselves, bypassing external frames, outside dependencies, and mainstream media. “We want to tell our stories”, says Cohen. “But we want to tell our stories for us”. *Ar Condicionado* is a symptom of, and conduit for, community cohesion and self-representation. Its outcomes resonate along local, national, and global axes, a vehicle of decolonisation. Geração 80’s mission does not primarily pertain to caring for more-than-human life, rather putting human animals first. It is important to remember that a non-violent cinema not only elects to not harm more-than-human beings such as plants, bacteria, and fungi, but takes care to respect human animals’ lives, too. Telescoping outwards from this observation, we should note that disanthropy, a vehement distaste for anthropic life which usually rears up in environmental discussions concerning human animals’ negative impact on the planet, offers nothing to the intellectual or practical frameworks of the future. We are part of the world, for better or worse, and our collective challenge, as mentioned in chapter 5, becomes learning to live with our multispecies companions on a fragile earth. Furthermore, many bacteria literally call our bodies home; to such beings, we are, in a way, a planet. The fact that bacteria form similar structures inside fungal, creaturely, and vegetal bodies highlights our non-exceptionality besides our connection with all other earthly life. Human animals’ presence on earth can be world-ending or life-giving, and biofilms’ production inside our guts, for example, can display the critical, beneficial roles we might play in stewarding local and planetary ecologies towards increased robustness and diversity.

Sumarni Laman is an Indigenous citizen of the Ngaju Dayak tribe, a cinematic activist, artist, and educator. Laman is Program Manager at the Ranu Welum Foundation based in Kalimantan, a Dayak youth initiative combining Indigenous knowledge and cinema technology to empower Indigenous youth to articulate their autonomy, protect their homes, and preserve their culture. Laman is a key part of Ranu Welum's International Indigenous Film Festival (IIFF), which showcases art by Indigenous artists at events in Bali, Kuching, and Kalimantan. Ranu Welum explores how Indigenous knowledge—cinematically safeguarded, transmitted, and activated—can protect the world. The 2021 festival's theme was Earth Protector: Heal the Land, Heal the Future.

Indigenous rights are constantly violated in Kalimantan, even though Dayak communities have stewarded Kalimantan Island for generations. Land grabs destabilise communities, disrupt cultural practices, and destroy independence and subsistence operations. Mining is pervasive and aggressive, polluting local water. Forest fires are becoming increasingly regular. From 2015-2020, over two million hectares burned. The haze produced by these ongoing fires poison Dayak communities, plants, and more-than-human animals, all of whom have received little to no aid or coverage in mainstream media.

Ulin: The Guardian (2021) is a documentary by Laman and Emmanuela Shinta, Ranu Welum's founder and leader. It follows Peresto, a tree expert from Talekoi, an ancient Dayak village in the heart of Kalimantan. Peresto cares for many plants, including Ulin, a mighty member of the ironwood species native to Brunei, Indonesia, Malaysia, and the Philippines. In the film, Peresto speaks about how to listen to plants.

To nurture a plant since it is still a seedling, then plant and grow it till we see many trees and forests. It's all about feeling. If we grow a plant, we should understand its

language. If it looks yellow and withered, we have this feeling: ‘Ah, you are hungry. You need more water.’ Then we water it. A plant is dying. ‘Why are you dying?’ ‘I am pinched.’ If someone only understands by brain, he will get the seed, put it into poly bag, plant it, done. But he has not feeling for that plant. ‘If you are dying, then die. I have planted you anyway.’ If he has a feeling, he will think for next couple of days: ‘It’s sunny. The plant must feel hot.’ Bring at least a bucket of water, and water it. So we think as if we have left our friend there.

For Peresto, plants express themselves through gestural signals and patterns of growth, which combine as a language we can interpret and sensitively respond to. As *Ulin* begins, Peresto lays his hand on Ulin’s gnarled trunk in a gesture of familiarity and shared connection. Blame for forest fires is continuously placed on local farmers and communities, and criminalisation allows outside forces to drive Indigenous Dayak communities from ancestral lands, further accelerating environmental catastrophe. “If you asked me why”, Laman explains,

Central Kalimantan is the lung of the world. We have many forests, and lots of coal, too. But if everyone knew about what was happening here—if people knew about the discriminations of the Indigenous people, about the destruction of the forests, about the destruction of the rivers—they would stop consuming or buying these products, which would impact the world economy. This is why these things are not covered (2022, interview with author).

Ranu Welum wields cinema to tell Dayak stories in relevant ways. “The mainstream media don’t cover us”, contends Laman. “So we wanted to be the media”. Ranu Welum

teaches Dayak youth how to use digital technology to produce and distribute cinematic media at local venues and festivals, and along non-canonical channels, like YouTube. Workshop participants are taught how to handle equipment, trained in film form and narrative, shown how to tell stories in a Dayak vocabulary. The programme remedies largescale oversight and misappropriation. Laman explains how

Sometimes non-Indigenous people make a story or film about Indigenous people. It's not original. They are not making a story from Indigenous peoples' perspective.

That's why they break many people's hearts when they see the films. That's why we prioritise, at the film festival, the films made by Indigenous people. These people know the story. These films: they have meaning. They change people's hearts. They change people's minds.

Ranu Welum equips Dayak youth with the tools to perpetuate their culture, not what others think their culture is. "We give space for Indigenous people to stand up", says Laman, "to be the ones who tell the stories, instead of having other people tell our stories for us".

Cinema, as deployed by Geração 80, the Iris Film Collective, and Ranu Welum, is a vehicle for solidifying community. "The thing about Indigenous knowledge", Laman states,

especially in the Dayak community, most of it is not a written knowledge. For example [holds up a bag made by traditional methods]: like making this bag. There is no written knowledge about this. You must learn that knowledge from the elders. Our knowledge is a practical knowledge which you get by talking with the elders, really

spending time with them. The problem now is many young people in the Indigenous communities have to leave their village for education or work. This makes the connection to the elders fall apart, and these gaps are getting bigger. Films are a great platform to share these messages, a tool to preserve the knowledge. Many Indigenous youth are trying to document their almost lost traditions.

In this scenario, cinema does not bulldoze, rather preserving and transmitting, Indigenous knowledge. As Laman explains, Ranu Welum liaises with elders and the wider community during their projects.

We cannot just come to the community and try and make a film and show our cameras and go around making films. First, we have to really talk to the people about what we want to do, so they also understand the importance of the films. Yes, we make these films, but we make them about you. This is your film. After we edit the films we share them with the community, before we release them to a global audience. (Laman)

The community's views are respected before artworks' release, and artworks are produced by entire communities.

Cohen argues that cinema only happens when shared. "Imagine a plant without water", Cohen says. Films are collaborative endeavours that come alive when collectively enjoyed. Geração members gather weekly to watch artworks by African artists. Films are projected then debated over meals and drinks. These events bring people together, embodying

commitments to respect others' views. For Geração and Ranu Welum, cinema coincides with wider projects of inter-generational cohesion, cultural resilience, and preservation. Screenings are not voyeuristic journeys enjoyed in silent, quasi-isolation but conduits of collective connection, comparable to hospitable meals. Doing, in our interview, speaks to such beliefs when he says that

A cinema can be more than an entertainment venue. Cinema does not take place in an imagined reality. Cinema takes place in the here and now. Without an audience there is no cinema. I like to compare filmmaking to cooking and gardening. Thus, the final screening is comparable to a dinner table with multiple guests. Potentially, cinema feeds us.

“That’s the most important thing for me”, says filmmaker Phil Hoffman,

communion. A place to come together to experience, to express, to talk about the images of our lives. No matter what the technology, this practice should persist. It’s the exact opposite of propaganda, showing something to convince someone to see it your way. Cinema is sharing and should be open like good poetry. I hope that the germ of this idea somehow finds its way into the future (2022, interview with author).

As Nadia Bozak, author of *The Cinematic Footprint* (2011), remarks, “I like to think that community and the communal will be part of the paradigm shift that charts a better way

forward. Why can't we share cameras? We don't all need our own cameras or equipment or studios. Why not share?" (2022, interview with author).

EXCHANGE

SHARE

RESPECT

GROW

The Film Farm, set up by Hoffman and Marian McMahon in 1994, cooks up a particularly satisfying cinematic meal. The Farm is an artists' retreat at Hoffman's farm in Mount Forest, Ontario, Saugeen First Nation territory. Participants are invited to make films with analogue equipment, and taught how to respectfully hand-process analogue film using plants.

'Finished' artworks are not the only criterion of achievement. 'Failures' are also valuable.

The workshop is process-oriented. What participants learn and do, and how they do it, is equally, maybe more, important than what is made. Hoffman has pioneered flower processing as a creative and less toxic alternative to mainstream production which relies on harsh chemicals like Dektol. After films are shot, plant sections are used to develop and modify stock. To ameliorate plants' extraction and horizontalise potentially fraught encounters, Hoffman acknowledges vegetal sovereignty, honouring plants' generosity. "Being aware that

the plants had a life before I came along, so tending carefully to the plants I use for processing is an important responsibility. Not taking too many, so not to stunt their reproduction, and their visual beauty and place in the land” (Hoffman 2022). “I find exchanges work well”, Hoffman continues. “To the plant: ‘I’ll water you, if it gets too dry, if I can continue to hold your beauty?’ These little games circling, circling in my mind...” (Ibid.).

Hoffman listens to plants, who partly display their assent to picking by growing in abundance, explaining how

Every spring the supermarket sells hyacinths in April. We buy them and enjoy them until their bloom fades, and then dig their bulb into the front patch of the garden. We must have 20 or 30 hyacinths growing their now [...]. The hyacinths come back every year and I use some of them for processing. I like to think they have a good life, as a gardener I assist in their existence, through my relationship with them. Do they agree with me using them for processing film? In a way their answer is in their continued growth and beauty, and that beauty resurfaces in the images that surface from the film processing. This is a healthy conversation between me and these plants, and points to the similar desires plants and humans have. As my friend, poet Gerry Shikatani says, at the end of our film *Ever present, going past* [2007], ‘A garden includes water. It also includes thirst’”.

Like Peresto, Hoffman listens to plants with his whole body. Eyes, head, hands, heart.

Hoffman’s beliefs about plants were enhanced when Indigenous artists from Saugeen First Nation participated in two workshops at Chippewa Hill at the Saugeen First Nation

training centre, about 100 kilometers north of Hoffman's farm, in 2018 and 2019. "At the Saugeen Takes on Film [STOF] workshops", Hoffman explains,

we were taught the uses and power of herbs by the Saugeen First Nations Advocacy Program Coordinator, Lori Kewaquom, in exchange for a workshop in hand-processing with plants and flowers for Saugeen First Nation artists. I told Lori that when we take the leaves and flowers from a plant we always take less than 25% of plants' bodies. I guess I was trying to impress her with our ecological commitments. She answered: 'Next week I will teach you how to ask the plants how much you can take'.

STOF workshops were designed by Debbie Ebanks Schlums, Hoffman, and Adrian Kahgee, an Indigenous citizen of Saugeen First Nation.

Saugeen First Nation is an Ojibway community on the shores of Lake Huron, at the Bruce Peninsula. The Ojibway are an Anishinabek Nation. In Saugeen cosmology, human animals arrived in a world underway, home to beings who shared their knowledge generously. Plants were, and are, key people in this community, providing medicines, food, and other important materials, showing us how to live. This cosmology lives on through the workshops' outputs. Nataalka Pucan's *Mii Yaawag* (2018) begins with a pan across a sea, then cuts to a feather floating along a grassy dune. Another cut takes us to some anthropomorphic driftwood, with pits echoing human animals' eyes. A straight cut introduces a woman addressing the lens in close-up, her authoritative but welcoming stare exuding recalcitrance, sovereignty, and warmth. Arguably, this cut is a match-on-action, articulating plant-human animal filiations. The edit is not only aesthetic, relaying human animals' morphogenic

similarity to trees. It is ontological, pointing to human animal-plant kinships. Later, we see this same woman, half off-screen, at frame left. Bent over, her hair falls downwards into frame centre, echoing a willow's earthbound bough. A voice sings out alongside birdsong and wind. The camera passes through the woman's hair, plunging towards the grass, scurrying along like an insect, articulating the fluidity of earthly life.

The workshops concluded with screening events on Saugeen First Nation lands. Onwards plans were devised with community members, who conveyed the importance of preserving the films in ways that honour people connected with them. Traditional foods and wild edibles were shared. Viewers met filmmakers whilst learning about Indigenous Saugeen crafts and knowledge during other activities. Cinema fed a variety of community-oriented endeavours, accelerating new and mutual growth, shared understanding, and reciprocal exchange.

MAKING WITH AND FOR OTHERS

Many key filmmakers produce conditions where others may exhibit creativity and sovereignty. They steward cine-ecologies, audiovisual media physically including human and more-than-human beings. Alisi Telengut shows us how to do this. Telengut is a Canadian visual artist of Mongolian origin. Her process blends digital imaging techniques with Indigenous Mongolian artisanal practice and belief, turning handmade art objects into audiovisual media. Telengut works on a single surface or piece of paper, painting with pastels and fingertips, to produce a three-dimensional picture on a magazine-sized substrate. Scenes

are painted, photographed, and then either adjusted, erased, or painted over. Films are produced live on the canvas, which, at the end, stands tall and thick. This procedure is repeated over many months, concluding with the creation of two interrelated yet distinct artworks: a digitally rendered film made via stop motion animation, and a sculptural artefact made by hand. “Animation is a long journey of solitude”, says Telengut in *Solitude* (2016), her documentary on her practice. Telengut continues to say that “Animating is more than an artisanal or technical activity. It’s beyond the appreciation of beauty or movement. It’s about serving your ideology through hours of contemplation, labor, or even torture. In the end, it’s about unity of you—the subject—and the world”. Telengut’s primary media of devotion are manual labour and time which synthesise in textural media that relay her grandparents’ knowledge, who lived nomadically on Mongolian grasslands.

In an Indigenous Mongolian worldview, reincarnation is a privilege shared by more-than-human animals, who are spiritual beings with lives full of unique hopes. As I explained in chapter 2, killing and eating more-than-human animals are regulated activities of deep respect, solemn gratitude, and heartfelt apology. More-than-human animals are not storehouses of calories or instruments, but sovereign beings worthy of honor. Telengut’s film *Tears of Inge* (2013) tells the story of a camel who rejects her child after a traumatic birth. A human animal voiced by Telengut’s grandmother consoles the crying camel by stroking and singing to her until she is soothed and the calf can return. *Inge* exhibits a multispecies union based on love, mutual respect, and shared experience, devoid of extractivist objectives. It conveys, via the camel’s assent to the human animal’s signs, the possibility of shared understanding. According to Indigenous Mongolian belief, not only more-than-human animals but also plants enjoy lives comparable to, yet distinct from, ours. In *The Fourfold* (2020), Telengut includes actual plants. Real plants line crystalline rivers, or reveal emerald forests beneath expansive skies. Plants’ physical distinction from elements rendered in pastel

makes them protrude from the surface and intensifies their movements' jittery quality. This discordance typifies plants' lack of synchronicity with human animals' rhythms and goals.

As Telengut says in our interview,

I included real plants and other materials [...] as they have their own distinct forms and textures which look different from two-dimensional painting. It is not to devalue my painted animation, rather it is an attempt to develop a form of perception or sensitivity to expand my own and viewers' bonds with nature (2022).

Now, plants are not only animate-*d*, but animat-*ing*. Midway through, plants emerge from a river, proliferating from background to foreground, until finally enveloping the image.

Horizontally across the screen, a forest of diverse plants forms, bisected by a river of glittering ultramarine. Typifying the uncontainability of vegetal life, plants are never static but ceaselessly quiver, alive.

Furthermore, we go on to point out how Telengut works mainly with conifers (such as foliage of cypress or fir) and mosses. Conifers grow across the Northern Hemisphere and are populous in the taiga forest. Mosses, on the other hand, are the primary food sources of the reindeer living in the north of Mongolia. Telengut also uses red clovers, commonly considered weeds in Canada, but also valued for their medicinal properties. The films' imagery grows through the gradual accumulation and fusion of organic and inorganic matter, stewarded by Telengut, forming cine-landscapes of multispecies design. Consequently, Telengut's practice signals as a form of 'cine-gardening', guiding cinematic landscapes towards increasing levels of environmental complexity through the execution of terraforming

techniques: introducing new plants to the cinematic surface, for example, or sculpting ravines of pastel through which water runs. [Fig. 21, 22]

Telengut's media are entangled artefacts apropos to a worldview eschewing the value-oriented divisibility of species. "The traces of previous frames and my labor exist in every present frame", Telengut says. "They can never be erased or removed completely, and future frames depend on them. Each image is entangled with each other and with everything else in the animation process" (2022). Working on one surface, former scenes are not locked away, but live in the present.

In another work, *Long Live Forest* (2020), plants lay horizontally but also stand vertically, denying, as Giovanni Aloï might say, "the ontology of illustration" (2020: 16). Plants grow out of the page and the screen, as the ostensibly two-dimensional surfaces become media of vegetal affluence and new growth. This scans as a commentary on cinema's ability to function as a substrate for others' survival. At the confluence of more-than-human power, digital and hand-based practice, and Indigenous Mongolian knowledge and its associated regulations, cinema maintains and develops honorable relations with the earth. Telengut exhibits ways of encountering the world beyond destruction and control.

Telengut's practice is intimately tied to Indigenous Mongolian crafts: knitting, weaving, and embroidery. Telengut's embodied approach connects her to her relatives and culture, and to the other beings involved in the production, enabling productive exchanges across time and the species divide. Reflecting on her practice's relationship to Indigenous Mongolian crafts, Telengut says that

The communities' stories and relationalities are weaved and crafted into the fabrics and materials with unique patterns, designs and techniques. I see under-camera

animation as a similar process that not only reveals aspects of materiality and tangibility, but also indicates the animation process as a phenomenon where humans, non-humans and the technical other are entangled in the co-creation. [...] This gesture allows the animation process and my body to be in a co-creating and even a symbiotic relationship with the plants, stones and particles. They become active agents and voices in the creation process which deconstruct the human-centred perspective (2022).

In our interview, Telengut seemingly aligns with MacKenzie, who in an earlier quotation proposes the possibility of a less destructive cinema capable of restoring inter-human and human/more-than-human animal affiliations. As MacKenzie says,

Can we make films that attempt to speak a different language, one that is beyond the human, as a way to change the limits of understanding and communication and attention that we have imposed upon ourselves? I like to think that this is what is being attempted in certain kinds of experimental work, but there is so much more to explore in this realm, not the least of which is finding ways to collaborate with nature with its consent and not by colonizing it yet again (2022).

ATTUNEMENT

Key filmmakers experimentally attune methods to others' rhythms. This often means slowing down. This does not mean that more-than-human others behave slowly. As mentioned in chapter 3, methodological slowness means taking time to build respectful relationships. Although media may generate slowly, activity during that time may be frenetic. Additionally, methods are never determined beforehand but designed through honourable listening, learning, and communication with other human and more-than-human subject-agents, who are offered shared autonomy over processes and finished products. This is not to say that artworks are ever finished, traditionally speaking. Through processual synchronicity, artworks assume their makers' identity.

Some of Hoffman's films include walnut husks' to inject sepia colouring, harvested from trees planted by Hoffman 30 years ago. Films employing walnut husks are consequently also thirty years old, and furthermore, they include other beings' input, many of whom are far younger or even more ancient, each operating at different velocities. Hoffman himself uses floral metaphors in connection with filmmaking. In our interview, Hoffman explains how

My statement 'the film will bloom when it is ready' relates to the gestation time of an artwork, when the unconscious is aligned with the creative process, and a work is ready to be born. I think working with your hands in the bucket, swishing the film into existence fully embodies this process. More specifically the actual plant-film 'birthing' process can be seen as a corollary to the psychological process stated above, with the plant bursting out of the ground, when it is ready, the halide crystals transforming into metallic silver as the image forms... You see your sparkling film and images forming, under the glow of the red light! The blooming of the image continues as you dunk the film into the salt fixer, where everything that has not been

struck by light disappears, the unlit halide crystals shed their skin, and the matured image surfaces between 12 and 24 hours in the salt fixer. (2022)

There is no fixed time or trajectory, only patience, receptivity, experimentation.

RERACINATE

GO BACK

DEPUNCTUALIZE

GO FORWARD

As explored in chapters 3 and 4, deracinate means to sever from the roots. Reracinate describes a restorative trajectory, to re-root. Reracinating requires contemplating the materials and systems underwriting cinema before pioneering less destructive practices from places of responsibility. These parameters are ascetic and positive, creatively triggering artists' ability to operate beyond human animals' self-assumed exceptionality.

In our interview, Bozak points to how artists may rifle through peripheral sites or actual dumps for extant media to restyle, highlighting one way in which filmmakers might reracinate.

Resource scarcity of all kinds is writ large in our future. In my mind, we will remain a species that depends on mining and extraction, but the resources we will be mining for will be located in our current dumps and trash sites. [...] Our trash is rife with precious resources (metals, glass, plastics, all and sundry e-waste), and I see a future where we learn by necessity to reuse and reconstitute rather than to produce anew. Cinema, as I can see it, may also take the form of reusing extant images and technologies rather than to carry on innovating and producing an overabundance of cinematic content. I think of early Soviet cinema here as an example of producing cinema in times of scarcity, repurposing images through montage, for example, producing new meanings using old images rather than producing new images (2022).

MacKenzie looks to already available elements. In his practice, defunct media facilitate more sustainable experimentations. As MacKenzie explains,

I struggle with the animal ingredients of cine-film as well as its mass market production, and have explored handmade emulsions, cyanotypes, phytograms, .etc. as possible elements in alternative methodologies. The tools and much of the stock I use are relics, considered landfill in the economy of image making. So at least these aren't being cranked out of factories, made of ever more plastic and metal and glass. The thrift store (or charity shop in your neck of the woods) aspect of my practice allows not only a freedom from evermore new formats and resolutions, but it also slows it all down as the work can be made outside of that race. There is a lot of reduce and reuse, and a little recycle too (2022).

Key filmmakers regularly operate along non-linear axes, eschewing progress to repurpose, redeploy, and recycle items for originally unintended ends. They practice, to borrow Bozak's words, an "aesthetics of reconstitution" (2022), similar to bacteria, fungi, and plants, who are continually recycling nutrients in order to help increase futurity's likelihood. Bozak continues, arguing that

I do think that in a future world of resource scarcity, artists of all kinds will necessarily need to repurpose extant materials and find new meanings therein. The "how" is overlooked currently in an age of unbridled innovation when the materials and resources to produce images are seemingly bountiful. Perhaps your idea [to film like a plant] connects to the idea of making use of what is local, what is at hand, as vegetation/plants also, obviously, are rooted down and necessarily adapt to the immediate environment and its conditions (Ibid.).



On previous page: Fig. 19, 20. Telengut, *The Fourfold*.

Images courtesy the artist.

Reracinating applies to digital technology, too. Neozoon are a German art collective making found footage films by harvesting content from digital platforms. Clips are slowed down, looped, or otherwise modified to tease out certain, not immediately apparent qualities. A key theme for Neozoon is violence towards more-than-human animals. Exploring their practice's ecological dimension, Neozoon say that

We are happy about this question, because we are rarely asked it. When choosing our materials, we are always concerned with a form of sustainability, and we don't just relate that to the urgent need for more ecological production conditions in the film industry. Since the beginning of the digital age, we have been exposed to an ever-increasing flood of images, produced by the millions for a few tired clicks - and that also produces a lot of digital garbage. From our point of view, it makes little sense to keep producing new material. There's nothing that hasn't already been filmed somewhere in the world, so why go through the effort again and again? So it is both an ecological and an economic consideration. At the same time, our film collages are also about revealing visual axes that are only possible with the help of existing material. So there is also a substantive necessity (2022, interview with author).

In different ways, key filmmakers are scientists and visionary inventors, moving backwards. "History tells us that people who are working experimentally sweep up and then re-invent with outmoded processes", says Hoffman,

though often don't live to bear the fruits of their innovations. Of course, I do not expect digital production to be replaced by flower processing of celluloid... But I think there is some worth in squeezing out the fine juices of past practices (analogue) to procure philosophical depth in what we do in the present, and of course that feeds the future (2022).

Analogue film physically exemplifies this perspective. At first glance, it is uniplanar and two-dimensional. However, burrowed into by bacteria or fungi, three-dimensional depths and previously unforeseen horizons appear.

Furthermore, key filmmakers often depunctualize. Depunctualizing and reracinating are, from my perspective, interrelated processes. As explained in chapter 4, depunctualizing means breaking gadgets open, exploring their insides, appropriating and re-purposing them for unintended ends. It has a temporal dimension, too, concerned with slowing down, and rejecting the accelerationist fantasy of ever-more consumption. MacKenzie grasps towards a cinematic future severed from the standard rhetoric of progress, explaining how

In my practice I have been most interested in acting upon both image and mechanism in ways that step away from their intended use. By stripping back, studying the material and better understanding their building blocks I feel like I can take those blocks and rebuild and reshape them in ways that break from notions of capital and empire, or at least comment on these grand missteps and poor choices we have made in our collective and relentless drive toward (and over) the edge. Amateur or hobby made works have much to teach us about practising a more loving approach to image

making. I think it is also a matter of mental health: slow down, go easy on yourself and others, take care.

FREEDOM

PRESERVATION

Key filmmakers work marginally to maintain autonomy and spontaneity. Marginal practices can develop and evolve with higher freedom, also providing spaces for others to impact filmmaking processes in unforeseen ways. “The capitalist system in filmmaking demands that everything is done to an end goal of profit or fame”, says Hoffman,

When you remove this equation, what’s left is process. I remember when I was starting out in this practice, developing photographs in my childhood basement darkroom, which served as my mother’s painting studio. I would get very excited the moment silver started to form, and the image came into being. This kind of spark is the catalyst in my filmmaking process. Something I do not have control of, yet somehow am a part of, drives all aspects of my filmmaking. It lets you be partner with the world, which has a say in what the film is going to be (2022).

In our interview, Doing explains how

I am still convinced that the capitalist idea of endless growth is completely unrealistic. As an alternative I propose to aim for sufficiency, when you have what you need there is no need to grow further. This applies to the material aspects of life, as for the immaterial aspects on the other hand, I am all for life long learning and development. At present I am trying to walk a fine line between professionalism and a scaled back minimalist approach and I am driven to defend this ferociously. Recently, I read *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* [2017] by Kate Raworth and her thinking coincides nicely with my own ideas. One of the key aspects that she raises is the exponential growth graph that we all know so well: a line shooting up into space. Her proposal is to replace this with a graph that resembles the flight of a plane, including landing. Being able to imagine that landing is one of the main goals of a different kind of economy. [...] My own solution is to focus on quality and ethics and stubbornly ignore the fact that my work remains marginal. One could say that this is a 'toothless' reaction and that we have to fight back. But I reckon that there is great power in withdrawal, the game can't continue when there are no players. A sort of *Walden; or, a Life in the Woods* [Thoreau 1854] approach to filmmaking (2022).

MacKenzie, too, says something similar, sharing that

In simple strategic and sanity-maintenance terms, I have generally sought to present my work largely outside of festivals, organizing tours and screening dates around places I would like to visit and folks I would like to interact with on a schedule that

makes sense and reduces the volume of travel overall. If I do present in festivals I rarely participate if there are entry fees involved. Most festivals don't offer payment of any kind, and that, too, is problematic if one is trying to cover their costs. The idea that we should all just be thankful that we have been chosen is deeply embedded in festival culture. Not cool, highly manipulative, and greedy, to say nothing of encouraging a culture of competition that plays right back into empire. And what about the rest of the planet? The conceit that humans are the centre of the universe is a huge problem. Our actions need to take all living things into account, and we need to be able to accept inconvenience and some reduction in our indulgent lifestyles in order to help things recover. That requires a massive shift in the way we "do business". How about no business? That sounds really good to me.

Working on cinema's unkempt verges is a means of self- and planetary preservation.

NECESSITY

WAITING FOR THE WORLD

LOVE

Trương Minh Quý, a Vietnamese filmmaker working between analogue and digital media, thrives on these verges. In Quý's films, a recurrent theme is that in 2045 Vietnam succumbs

to floods and climate crises, precipitating Vietnamese citizens' exodus to Mars. Mars is marketed as a new utopia where little is required and leisure time is abundant, so the climate refugees do not take much with them. In *The Tree House* (2019), an unnamed person takes a camera and audio recorder to Mars, intending to make a documentary. They never make this film, though one day they record their local environment's sounds, which remind them of wind on Earth. The film's voiceover, spoken by Quý, explains how this triggered a sharp nostalgia in the film's protagonist for their old home, now gone forever. After ecological catastrophe, cinema loses much of its purpose, relevant only as an archival device. There are no more images to show, no futures to imagine, only free time to reflect on what has been lost. The film proceeds from the viewpoint of the protagonist who speaks in, and reflects on, footage they had previously taken of an Indigenous community in Vietnam's forested mountains.

We see many houses in the film. Tents, urban abodes, tree houses on verdant mountains, and a cave, where a woman and her family live. The cave metaphorically represents humanity's original dwelling, a blueprint from which all houses followed. It typifies "a universal house", another way of thinking about "planet Earth" (Quý 2022, interview with author). The Vietnamese Martians are consequently homeless in an extreme sense, cosmic vagrants. Quý lived precariously for years. "This film started with a long term personal experience about how I always felt the temporariness of my family's house", Quý explains in our interview,

It's a reality in Vietnam, like all the developing countries, that everything is moving in very uncertain and rapid speeds. My parent's house where I was born was always under a development plan, so we knew that we would move soon, but we didn't know

when. [...] The government can keep your house under a demolition or development plan for twenty years. During that time you cannot renovate the house. You cannot sell the house. So the whole neighbourhood, not only my parent's house, the whole neighbourhood lived under that tension and expectation and anxiety for more than twenty years. Until last year when it was finally demolished. I always felt a fragile connection to home. Not only my house, but every house in the neighbourhood. It's not a proper house. It's very temporary. People don't want to invest too much in the house. You just build in order to be easier when you move (2022).

Building to leave is to set down the shallowest roots, maybe none. This lived transiency impacted Quý's work, which explores personal and collective homelessness through the lens of a newly uninhabitable planet. Furthermore, made on 16mm film, *The Tree House* will inevitably degrade. Quý explores precarity along thematic and methodological axes.

In *The City of Mirrors: A Fictional Biography* (2016), Quý, now himself on Mars, reflects on images that he shot in 2015. From the perspective of the catastrophic future, the images exude a hungry anxiety to address everything. It is as if, by 2015, Quý knew what was coming. Provisionally homeless, Quý hoards images, not things. *The City of Mirrors* comprises scenes where Quý has voraciously filmed his family around his childhood home. Quotidian actions beg us to just watch. Looking becomes an urgent pragmatism, a reverence to beings and things that will shortly be impossible. Future realities of ecological disaster infuse minor encounters with elevated beauty. Hanging up laundry in the sun, drinking a beer, rain drops on empty sandals, paint flaking off a ceiling. These should be cherished, the spontaneities of life that will inevitably disappear. Transient encounters between more-than-human and human animals are especially diaphanous and porcelain, perhaps because, at least

from the retrospective viewpoint of Quý's protagonist, they also portray connections that, as climate crises are largely anthropogenic, we have already betrayed.

Midway through the film, Quý's mother drips water onto the floor between a spotty dog's paws, which drinks up and leaves. Quý's mother lingers in the frame, abandoned, making the dog's recalcitrant sovereignty, manifest in its optional and spontaneous withdrawal, even more palpable. Later, a tawny dog enters Quý's home to drink from the spotty dog's bowl. The spotty dog appears and a complex choreography of greeting and acknowledgment ensues, including many furtive glances, movements, and sniffs, and plenty of tucked and wagging tails. Rain lashes in the background, quickly soaking the tawny dog's close coat. *The City of Mirrors* elucidates Quý's theory about film practice, which he calls "Available cinema". "I approach filmmaking in a different way", Quý says,

It's more for the joy of seeing. Equipment is, of course, very important. But in the end it is more about how you see the limit of your equipment and your situation. Then you find your creativity from that limit. Of course it requires more time when we make film in this way. Like if you want to shoot the film, you have to wait for the real rain. Even now with the next project—where, let's say, I have more budget—there will be more problems with a schedule, and things like that. I'm still thinking that I will shoot the real rain. But it might not be as easy as my films in the past. In this film, the budget is higher, the more people are waiting. This kind of thing... Personally I want to wait for real rain, but yet I know that maybe it's impossible because you don't know when is the real rain. But if you have the whole crew you cannot ask them to wait with you.

In ‘Truong Minh Quý: A Vietnamese on Mars’, Graiwoot Chulphongsathorn interviews Quý. Quý explains how “*The City of Mirrors: A Fictional Autobiography* is a documentary film down to its bones and sinews: documenting” (2021: 78). ‘Available cinema’ and ‘documenting’ intertwine, as they both concern equipment scarcity and blockades to access, besides the creative utilisation of available means. They are also about recalibrating expectation, opening ourselves to what others make available, before documenting such fleeting phenomena without discretion or expectation.

I recently attended a screening of Jacques Perconte’s films at Birkbeck Cinema. After the show, Perconte said that “I don’t care about filming waves”. This struck me as odd, as seascapes recur in Perconte’s work. In the Q&A, I asked, “Why then do you repeatedly film waves?”. Perconte replied, “I don’t care about filming waves because I love them”. By “I don’t care”, Perconte, I think, meant that he went to the shore and filmed what was available. He loved waves by never wanting them to be anything but that they were, enjoying whatever gifts were given. Perconte’s comment helped me understand Quý’s available cinema. Available cinema formalises a love for the world, articulated by documenting whatever is available.

WINDOW

Cinema is often construed as a mirror, or made to serve mirror-like functions. Artworks reflect dominant views of the world back to certain audience members, whose outlooks are cyclically affirmed. Yet key filmmakers, I think, are bound by two alternate criteria. First, to

experimentally subordinate method to others' styles of life, whether human or more-than-human. Second, to conceive of, and utilise cinema as, a window. From these two criteria other elements are logical outcomes. "Cinema is an intermediate", says Doing, "helping us to perceive signals that would normally exist beyond our event horizon" (2022).

In western parlance 'medium' is generally a jokey or derogatory word used to address secular mystics able to commune with spirits or the dead. A medium is also something that beings may live inside, as in organisms cultured in nutrient-dense media. Cinema's designation as a medium speaks to the mystical and ecstatic ability of art to act as a window or bridge between worlds, as mediums are said to be able to communicate across the life/death divide.

All earthly life is simultaneously quotidian and alien. Every being is available but impenetrable, enjoying a life I will never understand. The same applies to the person I live with and speak to every day—my beautiful Evie—who yet remains as nearby and distant as a plant. Cinema offers a raft over this insurmountable chasm between us, like a beam of light shot across a dark auditorium.

To conclude, I analyse Ted Chiang's short story, *Tower of Babylon* (1990/2020), a poetic yet candid exploration of earthly finitude and a springboard for thinking about how key artists contrast with mainstream production.

TAILPIECE

In Chiang's story *Tower of Babylon*, we follow Hillalum, a miner from Elam, who travels to Babylon to mine through heaven's vault. Babylon's tower is a vehicle allowing human animals to speak with Yahweh, their creator. Chiang explains that,

Many centuries ago, there began the construction of the tower, a pillar to heaven, a stair that men might ascend to see the works of Yahweh, and that Yahweh might descend to see the works of men. It had always seemed inspiring to Hillalum, a tale of thousands of men toiling ceaselessly, but with joy, for they worked to know Yahweh better. [...] Yet now that he stood at the base of the tower, his senses rebelled, insisting that nothing should stand so high. [...] Should he climb such a thing? (8).

Towns ring the tower, offering respite and sanctuary to the caravans as they journey skywards with foodstuffs and other materials intended to sustain the population of labourers working incessantly at the tower's extending zenith. These towns' denizens lack a desire to know the earth. "Would the [tower] children [...] scream if they saw the ground beneath their feet?", Hillalum wonders. (21) People are born and die on the tower. "We live on the road to heaven", says Kudda, a cart puller, "all the work that we do is to extend it further. When we leave [this town], we will take the upward ramp, not the downward" (17).

Ascending the tower engenders a confusing vertigo, as Hillalum transcends the moon's zenith, which swims away in stately silence. Next he leaves the sun behind, and sunlight begins to fall upward, like evaporating light. Then the caravan winds through leagues upon leagues of glittering stars, which roar past and even crash into the tower. Finally they arrive at the tower's tip, perceiving the heavenly vault, a featureless surface spreading in every direction, close enough to touch.

Here, standing upon the square platform at the top, the miners gazed upon the most awesome scene ever glimpsed by men: far below them lay a tapestry of soil and sea, veiled by mist, rolling out in all directions to the limit of the eye. Just above them hung the roof of the world itself, the absolute upper demarcation of the sky, guaranteeing their vantage point as the highest possible. Here was as much of Creation as could be apprehended at once. The priests led a prayer to Yahweh; they gave thanks that they were permitted to see so much, and begged forgiveness for their desire to see more (22).

In this passage, the earth's beauty contrasts sharply with heaven's façade, which bears a blank and oppressive gravity, offering nothing. "No openings, no windows, no seams interrupted the granite plain" (23).

More-than-human animals are sacrificed before work may begin, to guarantee a successful endeavor. Then the miners set fires, superheating the stone, before splashing water against it, and cracks start forming in the rock. They carve out caves for rest as they travel upwards, designing a complex cityscape inside the vault's wall, which seems to go on forever. Might heaven simply be not a paradisiacal garden or prelapsarian reprieve, but a

geological and lapidary confusion of glistening gemstones, crude rubble, and unforgiving rock? Panic turns to acceptance, as the fevered work of religious expedition gradually transforms into the quotidian work of daily chores and maintenance.

For years the labor continued. The pulling crews no longer hauled bricks, but wood and water for the fire-setting. People came to inhabit those tunnels just inside the vault's surface, and on hanging platforms they grew downward-bending vegetables. The miners lived there at the border of heaven; some married, and raised children. Few ever set foot on the earth again (28).

In the name of progress, the tower consumes materials, water, and human and more-than-human creatures. It belches smoke directly into heaven, like a monumental chimney stack.

Eventually the vault is pierced. Yet the miners have accidentally exposed a reservoir housing the Deluge's waters, which surge from the crack. Hillalum is carried off, scoured against the unforgiving granite, sucked through the crack, evacuated of breath. Confused, Hillalum awakes in a cave. He crawls until he sees light, then races outside, spilling onto a desert plain which shimmers and shakes as brilliant sunlight refracts against the baked sand, abusing his retina. "Was heaven just like the earth?", Hillalum anxiously frets. "Did Yahweh dwell in a place like this? Or was this merely another realm within Yahweh's Creation, another earth above his own, while Yahweh dwelled still higher?" (32).

A line snakes along the horizon. A caravan? Hillalum races towards it. "We are headed to Erech", says the caravan's leader. "You would deceive me!" Hillalum barks. "Erech is in Shinar!" (Shinar is the plain of Babylon.). "The tower", whimpers Hillalum,

“have you heard of it?”. “Certainly, the pillar to heaven. It is said men at the top are tunneling through the vault of heaven” (33).

It was clear now why Yahweh had not struck down the tower, had not punished men for wishing to reach beyond the bounds set for them: for the longest journey would merely return them to place whence they’d come. Centuries of their labor would not reveal to them any more of Creation than they already knew. Yet through their endeavor, men would glimpse the unimaginable artistry of Yahweh’s work, in seeing how ingeniously the world had been constructed. By this construction, Yahweh’s work was indicated, and Yahweh’s work was concealed. Thus men would know their place (34).

Equipped with new knowledge, “Hillalum rose to his feet, his legs unsteady from awe, and sought out the caravan drivers. He would go back to Babylon. [...] He would send word to those on the tower. He would tell them about the shape of the world” (Ibid.).

In Chiang’s story, the secret of the universe is that there is none. This earth is all we have. Everything is already right here, manifest in a just good enough Mother Earth, whose beauty reveals itself in white-hot sands and blankets of mist-laden fields. Yet deep forests have been decimated to fuel the fires fracturing the vault. New trees are planted to feed the hungry tower, requiring endless maintenance. ““When they began the tower””, explains Lugatum, another cart puller,

the architects knew that far more wood would be needed to fuel the kilns that could be found on the plain, so they had a forest of trees planted. There are crews whose job is to provide water, and plant one new tree for each that is cut.' Hillalum was astonished. 'And that provides all the wood needed?' 'Most of it. Many other forests in the north have been cut as well, and their wood brought down the river'" (9).

The earth and the city below are scars of the tower's ascent, devoured to sustain its growth.

None of them had seen the tower before. It became visible when they were still leagues away: a line as thin as a strand of flax, wavering in the shimmering air, rising up from the crust of mud that was Babylon itself. [...] When they did lower their gazes to the level of the river-plain, they saw the marks the tower had made outside the city: the Euphrates itself now flowed at the bottom of a wide, sunken bed, dug to provide clay for bricks. To the south of the city could be seen rows upon rows of kilns, no longer burning (3-4).

Babylon is a post-industrial wasteland punctuated by an exquisite tower. This jewel of anthropic ingenuity teaches us that the earth killed to acquire apotheosis and become as powerful or knowledgeable as a god is actually already synonymous with heaven, and the presence of god is something we already dwell in right now, surrounded as we are by the beauty of our good green earth and everyone we share it with.

We, too, may mine, deforest, and climb upwards until the earth is uninhabitable, burnt to a cinder or drowned by melting ice. Like the tower dwellers, we can live and die on this

ascent, only knowing the earth as resource, not home. Alternatively we may pause, stare over the precipice, and learn to look at the earth in love, as it rolls away towards the horizon in the form of a patchwork—sometimes eviscerated, sometimes superabundant—landscape of multispecies design.

Looking out to the side, the miners could see the dark Euphrates, and the green fields stretching out for leagues, crossed by canals that glinted in the sunlight. The city of Babylon was an intricate pattern of closely set streets and buildings, dazzling with gypsum whitewash; less and less of it was visible, as it seemingly drew nearer the base of the tower (11).

Plant-matter would perish on the journey to the loft, so the tower-dwellers grow their own vegetables. Above the sun, an inverted horticulture is practiced. Balconies splay horizontally from the tower's façade, suspended by rope. "The balconies had planks removed from them so that the sunlight could shine through, with soil on the walkways that remained; the plants grew sideways and downward, bending over to catch the sun's rays" (18). Like Gilles Deleuze and Félix Guattari, Chiang also tells us to "Follow the plants" (Deleuze and Guattari 1981: 11). Even on the tower, plants call us to the earth. Bacteria and fungi are undoubtedly active in the tower's upside-down gardens, for congruent with the rhizosphere's truths, plants never live alone. Bacteria and fungi, but also many more-than-human animals like worms, will be peering over the edge with plants, inviting us to depart from our inimical trajectory and look downwards, too, and fall in love with everything we are leaving behind.

The tower of Babylon is a literal medium, linking the terrestrial and the divine. It is at once salvific and profane, healing the earth as it annihilates, teaching us to care for that which

we are destroying. It is earth and heaven bound simultaneously. Alternatively neither, simply suspended in the air, like a slim slice of light.

As the miners ascended, in the course of time there came the day when the tower appeared to be the same when one looked upward or downward from the ramp's edge. Below, the tower's shaft shrank to nothing long before it seemed to reach the plain below. Likewise, the miners were still far from being able to see the top. All that was visible was a length of the tower. To look up or down was frightening, for the reassurance of continuity was gone; they were no longer part of the ground. The tower might have been a thread suspended in the air, unattached to either earth or to heaven (17).

The apex of cinema's technological progression aligns with the tower's architectural fulfilment, as their completions mutually precipitate planetary- and self-destruction. Like the tower's plants, my filmmakers work with and on the same medium, refuse to forget cinema's fundamental link to the earth, and move in different directions. The tower's construction is animated by the prospect of a view of something to come. Namely a glimpse of Yahweh, dwelling beyond the stars. In a dizzying loop of cosmic irony, entering heaven returns one to earth, and earlier times before the vault's molestation. My place is revealed, here and now.

Like the tower, my project does not reveal new views, in the sense of a previously inconceivable vision or viewpoint. Conversely, I want to invigorate fascinations with sights and experiences already available, many of which are mundane. I have subsequently withdrawn to cinema's most rudimentary ingredients, not only the analogue strip but simply movement and time, just as Hillalum returned to the Babylonian tower's base to explore its

zenith, which coincided with the realisation that we needn't make or do anything because everything is already right here.

So *A View of Things to Come*, my title, is misleading. Because I am investigating a state, not an image. Not a view, conversely a modality of viewing, locked within a vault to which cinema—toxic, deadly, beautiful, translatory—holds a key.

§ 7

***NON-VIOLENT
CINEMA
AS AN
ASPIRATION***

Art is concerned with life and death. For me the question is not to avoid death but rather bringing back life into a culture that is obsessed with death and destruction. A predator follows the traces that are inscribed in the landscape by its prey. But the same traces might be used by a lover to find their future mate.

(Karel Doing 2022, interview with author)

But do we not already exist, like Hillalum, within the heavenly vault? Do we require a key to a doorway leading to a place wherein we currently reside? Do we need cinema if we are already consumed by the cinematic realm?

This project is secondarily an investigation of films. First, it explores the machine: its inner workings, habits of consumption, and—yes—media products. Nothing whatsoever, including cinema, is comprehensible without analysing its processes of production. Consequently, films are invitations to contemplate how cinema operates, what cinema is, what cinema might become. Films are fruiting bodies, like flowers or mushrooms: phenomena through which cinema becomes desirable and digestible, lusted over or treasured. Beyond them sprawls a tentacular industry, vibrating beyond perception, echoing fungal mycelia. As discussed in chapter 4, we might approach this as another manifestation of the ‘cinematic absent-referent’, to borrow Carol J. Adams’s concept (1990), an industrial phenomenon rendered partially yet never wholly invisible through procedures of conceptual and material fragmentation, and artworks’ ontology. For data floats in clouds, and analogue imagery arrives riding beams of light, barely present even as it appears before us. Furthermore, the ostensible ephemerality of, for example, streaming begs oversight of digital materiality. The contemporary film scholar’s task becomes rendering the cinematic absent referent present before contemplating artifacts’ relationship to it. Consequently, I have investigated cinema like any other action. My arguments are intentionally unspectacular, imported from daily life. The restrictions and judgments we impose on ourselves must be applied to cinema. There is no disconnection between living and making art. Living, at least for us, is an art of killing to perpetuate life. How can we help life flourish even as we are required, biologically, to destroy it? Cinema is an art of sustaining life whilst eviscerating it. How can cinema sustain life, materially and thematically, whilst needing to eviscerate it,

given its voracious, industrial reliance on earthbound ingredients? Moreover, can anything eviscerate life in general, without targeting a specific body? Yes, by ravaging the conditions by which life flourishes. For example, by altering how certain human animals conceive of particular living beings' function, or by physically dismantling entire ecologies. There is, for neither us nor cinema, life beyond such tensions. This shared inadequacy precipitates a collective challenge, to perpetuate life without destruction. Can we do this? If not, how can our entangled styles of existence be justified? Pressed on how cinema might help rewind the climate crisis, in an interview filmmaker Karel Doing explains that

This is a very foundational question for much of my work and I am far from reaching a definitive answer. What seems very important here is that the answer cannot be reduced to mere content, but also needs to address production methods, distribution methods and education. There is a whole book to be written about this. But when I try to keep it simple, I think one of the core aspects is to consider the real costs of cinema just like we should consider the real costs of a plastic bag. [...] [C]inema has to land. Flying ever further upwards is unrealistic and unsustainable (2022, interview with author).

Doing's observation is instructive, as transporting purchases in plastic bags is becoming, increasingly, a final option. Employing alternate, recycled containers is an improvement. Best, however, is no container. Do I need so much? Can I carry my new belongings in my hands? This might mean that pared-back practices operative in hyper-local, community-oriented contexts would be improvements. However, best is no cinema. Doing seemingly disagrees. To quote this chapter's epigraph, "Art is concerned with life and death",

says Doing. “For me the question is not to avoid death but rather bringing back life into a culture that is obsessed with death and destruction” (Ibid.). Cinema, I believe, is a cultural luxury. Therefore it is optional. We can make it or not, whereas we must consume. As cinema may not exist, whenever it consumes, it becomes unjustifiable. As one experimental solution, we might bypass cinema, pursuing more immediate engagements with living, cinematic beings. But what of art’s value, and more specifically cinema’s, as a vector of multispecies communication and something that elevates our lives by, as I have argued, introducing us to living beings’ cinematic qualities? I reached my conclusions through cinema. A circular conundrum, I have no idea how to jam this loop. I am lost in the tension and propose, as one escape route, the loop’s abandonment, because we lack the luxury of time. Furthermore, we might call this, as Doing does in chapter 3, a ‘toothless’ reaction. Do we not need to fight back? But Doing and I celebrate the power of withdrawal. The game, as Doing says, cannot continue without any players. Celebrating life by cinematically consuming it seems mad, especially when that which we consume is already cinematic. Might we assent to others’ sovereign subjectivities and cinematic proclivities by not filming? Could we just watch the world, captured by its enoughness?

Can we even imagine a cinema operative beyond, as Pick says, “the dynamics of extraction, consumption, and waste” (2021)? Nadia Bozak explores a “carbon-neutral” cinema, “pushed to its literal and metaphorical limits”, as “a cinema that does not leave a residue; a cinema, therefore, without a permanent infrastructure or, perhaps, any physicality at all” (2012: 17). From one perspective, this is a form of cinema, contemporaneously unimaginable—maybe never, to come. From another, this already exists, manifest in living beings’ biosemiotic locutions. However, to my knowledge, no anthropogenic artifact has escaped cinema’s reliances on environmentally damaging practices. Yet attempts have been made. As mentioned in chapter 1, key examples include Alex MacKenzie’s *agar-agar*

(2017), including an emulsion produced with agar-agar (a plant-based gelatin from the cell walls of certain red algae, primarily *Gracilaria* and *Gelidiaceae*). Animals were freed, replaced by plants, whilst silver remains, binding cinema and geological extraction. Representing only a scorched, bubbling landscape, the film is a technical failure yet bearing fascinating experimental information, for it literally and metaphorically communicates cinema's constituent connection to routinised slaughter. In MacKenzie's film, cinema breaks down when decoupled from more-than-human animal butchery. Furthermore, in *A Venture into Vegan Filmmaking* (2019), Ahnelt and Urlus replaced creaturely gelatin with polyvinyl alcohol (PVA), and vegan alternatives to photochemical film became legitimate possibilities. Nevertheless, further work is required, for again silver and plastic are present. These ostensibly 'bloodless' elements have problematic histories, billions of years old, derived from the geological archive's formation and violent exposure, and carbon trapped inside long-dead creatures' bodies. Perversely, these are blended with recently exterminated animals then collectively re-animated to make imagery move. This machine is broken. Can we fix it? Should it be repaired? Do we have time?

I end by exploring cinema's industrial abandonment in conjunction with a cinema practice that could, in theory, remain. This does not mean retreating into edenic pasts that never existed. Conversely, I propose exploratory, future-oriented engagements with living beings as sovereign, recalcitrant, and cinematic. Acknowledging others' vitality requires refusing to molest them to maximally reduced degrees, conceptually or materially. This seemingly rules cinema out, including the ventures in vegan filmmaking mentioned earlier. I celebrate non-production, manifesting as a 'yes' to the world and a 'no' to ourselves. A key research outcome has been finding that we are unexceptional in our ability to signify or make cinematic art. That it has taken over three years of protracted, all-consuming research to reveal this rudimentary observation illuminates the entrenched, caustic blindness of a western

viewpoint. As I explored biofilms, mycomedia, and phytograms I appreciated these as things bacteria, fungi, and plants are doing already. Why must we make them? This is compounded because such media can precipitate bacterial, fungal, and vegetal harm. In chapter 1, I propose the value of cine-ethnobiological, -ethnobotanical, and -ethnomycological documents, exploring these as two-way forms of communication: half-true. Plants might speak back. Yet plants, I think, have no idea about cinema, nor do plants want to make films with us. These films are made, if not exclusively by, then primarily for us. We are leveraging others' participation for our benefit, possibly others' detriment. Consequently, we might stop making cinema. However, from another perspective, cinema is something we can never stop making. We exist in the cinematic realm, a synonym for life itself. We can approach cinematic expressions as expressions of life, and investigate the earth as a cinematic auditorium of biological exhibition. The cinema industry is a means by which we co-opt and distil living beings' cinematic power. Conversely, cinema can introduce us to living beings' cinematic power. Therefore cinema, and art generally, retain key value. Responding to this complex knot, we might hover uncomfortably at the lip of this utopian conclusion to locate a maximally reduced practice whose parameters are demarcated by an urgent refusal to destroy and a critical need to sustain.

Cinema's highest achievements coincide with its redundancy, for, at best, cinema reveals living beings' cinematic power. This loop recalls Ted Chiang's *Tower of Babylon* (1990/2020), explored in chapter 6, as moving images can transport us to a period of time before cinema's necessity, completion, or even origin. Acquiring cinema's loftiest peak, we emerge in a plateau before or beyond it. The task, now, is learning how to acknowledge beings' biosemiotically abundant (cinematic) expressions as indicating their sovereign recalcitrance, besides our non-exceptional ability to participate in shared regimes of communication and respect. This modality of viewing achieves cinematic satisfaction before

anthropogenic paraphernalia's deployment. Cinema is an ersatz reproduction of this fundamental form of exhibition and spectatorship. However, as Doing says, "it is hard to imagine that cinema will disappear anytime soon, there is rather too much of it!" (2022). Economically and culturally productive, and politically decisive, cinema will remain. Promoting cinema's abandonment is not only utopian but facetious. If cinema must continue, I propose urgently restyling cinema so that, whilst consuming, it might work for the benefit of the ingested. This means that some consumption is permissible, which is highly problematic and I disagree. Yet I see no way around this issue beyond generating practical frameworks for recuperative production. At a minimum, cinema might obey key protocols so that it may participate in remediating projections even whilst requiring beings' destruction. How might we move towards, and terminologically represent, this ultrafringe of making?

We need terms capable of addressing the breadth and severity of cinema's aggression. Pick has made significant headway in this context. In 'Vegan Cinema' (2018), Pick describes how cinema can satisfy veganism's rubric, identifying two conflicting ways of looking in cinema. There is cinema's primary mode of address, a carnivorous bearing, which appropriates beings as vehicles of external meaning. Conversely, Pick's "non-voracious alternative" evinces vegan attitudes (131). Instead of devouring alterity, cinema can acknowledge others' sovereignty by refusing to inject them into alien stories or treat them as mirrors of anthropic desire. Vegan artworks audiovisually implement vegan principles, addressing, yet declining desires to control, recalcitrant beings. Yet cinema devours not only human and more-than-human animals, but bacteria, fungi, meteor- and mineralogical phenomena, and plants. Consequently, I prefer 'non-violent', a term borrowed, too, from Pick. Adopting non-violence permits widening ethical concerns beyond carnivory (and/or cannibalism) besides the chance to seek inspiration from different strategies of eating. A non-violent cinema seeks to produce media products without executing any violence, material or

thematic. This is incredibly difficult, not least for cinema, which, like us, struggles to live non-violently because of a constituent inability to not eat. We can both deny every form of appropriation yet stumble when confronted with the recurrent hunger that can only be satisfied by eating living beings, an unavoidable symptom of our heterotrophic condition. By allowing us to not eat more-than-human animals, veganism provides one way to deny our biology, yet we must, at a minimum, eat plants, who occupy, according to Michael Marder, the “final frontier of dietary ethics” (2013a: 29). Likewise, even if materially and thematically vegan, cinema would require the extraction of oil and minerals, expediting habitat reduction.

Perhaps a non-violent cinema can only be aspired to, never fully achieved. In ‘Veganism as an Aspiration’ (2015), Lori Gruen and Robert C. Jones stage veganism as a vital yet unobtainable goal. More-than-human animals’ instrumentalisation is too pervasive, they say. Even as we reject the urge to purchase or consume more-than-human animal meat, instead electing to enjoy plant matter, we yet engage with and serve to perpetuate the ecologically destructive systems of, for example, industrialised horticulture, which not only instrumentalises plant life but destroys ecosystems sustaining insectoid, avian, and mammalian lifeways. Eating, and simply living, along any pathway requires the destruction or death of many sentient beings, mammalian or otherwise (157). Gruen and Jones reach this conclusion without considering plants’ enforced sacrifices in industrialised and small-scale agricultural contexts, their perennially overlooked deaths (and lives) further illuminating human animals’ incapacity to live non-violently. However, lacking tangible endpoints does not render action aimless, rather elevating process by transforming present and future failures from paralysing inadequacies into positive chances for onwards development. Approaching veganism as an aspiration means scrutinising every single act one partakes in, potentially elevating our appreciation of the intersecting injustices that sustain more-than-human animal

instrumentalisation even as they remain ostensibly disconnected from such issues (169). Even if non-violence is non-viable, it might at least regulate creation, maybe precipitating enchantment with the breadth of earthbound life. Moving towards non-violence, we might follow others' guidance. As discussed in chapter 2, certain Indigenous cultures propose that we were injected into a world already underway, comprising intelligent beings who offered their knowledge generously. The lessons others offered and still share not only include dietary instructions, also pertaining to film practice.

Plants are excellent instructors, yet maybe not the best, their nutritional techniques differing sharply from ours. Plants inspire and leave me disheartened, luminous peers I will never perfectly mimic. Their hospitality is startling, a river of gifts offered, generally, without reciprocity. Eating plants guiltily whilst striving to eat plants ethically, I reflect on the irony: only in extremely rare cases do plants opt to eat, with photosynthesis manifesting as a form of alternative consumption grounded in peaceful receptivity and onwards sharing. Consequently, filming like a plant is fundamentally flawed, for cinema, likewise incapable of not consuming, may never satisfy plants' instructions. Human animals' and cinema's mutual shortcomings disrupt our coincidence with plants, who shimmer beyond our overlapping horizons.

As we come to terms with a planet increasingly unable to support animal life, we must ask: is cinema beyond repair? Is it justifiable, must it be abandoned? Tackling such conundrums, we might explore, as proposed in chapter 5, *cinematic* enjoyments beyond *cinema* in plants' gesticulations, or snakes' slithering, sun-kissed bodies: a 'pure', pre/post-cinema cinema of nature, a perpetual string of moving images synchronised to the rhythms of “*La Matière-vie elle-même*’ (the material of life itself)” (Williams 2014: 153; emphasis in original). Alternatively, if we hope to maintain cinema as an industry, we might acknowledge plants' lessons whilst casting our gaze further afield, seeking additional instructors.

CINEREMEDIATION

Fungi offer more easily assimilated teachings. Many fungi are necrogenic, growing on dead matter. Likewise, cinema needs materials acquired by destroying living beings or the earth. However, fungi exhibit eaterly modalities whose destructive dimensions are offset by restorative potencies. Fungi largely eat and remediate, unlocking nutrients trapped inside others' bodies before rushing food to those in need, showcasing culinary and artistic strategies by which cinema could achieve less violent satiation. Living examples of how to achieve mutual prosperity even with those they eat, fungi invite artists to conduct cineremediation: the adaptation of practice to galvanise instead of eviscerate futurity. The task, fungi show, is not refusing to consume but restyling how one eats and handles the eaten's nutritional or creative power. Bacterial instructions lessons remain key, pulling us back to the earth, advancing cinema's reracination. As bacterial, fungal, and vegetal lifeways intermix, a film practice capable of remediating whilst consuming appears.

I am trying to delineate the material and thematic parameters of a justifiable film practice: cineremediation. Remediation means environmental restoration. For fungi, remediation is a biological exercise. Fungi decompose certain materials others cannot, like plants' lignin, rendering valuable nutrients re-available before shunting care-packages to wherever they are needed most, the transportation infrastructure generally fungal mycelia. Lacking mycological skillsets, dead matter would pile up sky-high, rendering earthbound life untenable. As Paul Stamets explains, we “[a]s a species [...] are adept at inventing toxins yet equally inept at eliminating them from our environment” (2005: 98). Fungi offer assistance,

through the practice of mycoremediation: the employment of fungi to assist in removing toxins from a polluted environment (Ibid.).

Stamets proposes a ‘multi-kingdom approach’ to remediating contaminated landscapes. As ruderal trailblazers, fungi jumpstart this process, precipitating life’s onwards radiations. As Stamets suggests, fungi activate, maintain, and direct the flow of nutrients throughout ecosystems. Consequently, fungi govern ecological equilibrium. When we introduce specific fungi into a precarious environment, we initiate a sequence of events involving a variety of kingdoms. The fungi’s arrival might trigger bacteria’s arrival, who will prepare the soil for plant life. More-than-human animals will consume the decaying mushrooms, whilst birds will wittingly or unwittingly ferry seeds from other landscapes, contributing to the emergence of plant communities. Fungi trailblaze remediation, preparing areas for habitation (89). Following Stamets, I seek inspiration from fungal lifeways, blending them with bacterial and vegetal schemes to produce frameworks for practical, restorative action. Fungi do not recoil before destruction, rather working through it, securing others’ flourishing. Fungi embody Donna Haraway’s concept of “staying with the trouble” (2016: 3), addressing disaster head-on, re- and co-building eviscerated ecosystems. Entangled with bacterial and vegetal lessons, fungal instructions expose a cinematic methodology targeted at shared, biological perpetuity: cineremediation.

Cineremediation’s parameters are demarcated by Kimmerer’s concept of the Honorable Harvest, introduced in chapter 2, a network of protocols aimed at ameliorating plants’ extraction and stewarding multispecies landscapes towards increased abundance and resilience, itself learned from plants. Extracted, conceptually, from plants, we might introduce bacterial and fungal teachings, applying the ensemble to cinema. The result would be an Honourable Cinema, deferential to, and coinciding with, others’ lifeways. Through

Kimmerer a framework emerges by which we can systematically classify how cineremediation occurs.

Cineremediation is a material commitment and thematic disposition, operative through production methods and representation techniques. Cineremediators must *re-use*, pushing cinema to a fringe from which production can occur. The best option is always using as little as possible, preferably making whilst having nothing new made. Furthermore, recycling generally refers to alternative strategies of disposal. Re-use, conversely, names singular objects' cyclical redeployment, a rejection to dispose. Re-using exceeds recycling, negating requirements to purchase more. Cineremediators must re-use ostensibly obsolete components, cultivating necrophilic tastes for out-dated or otherwise unloved equipment. Dumps, charity/thrift stores, and other peripheral sites are superabundant springboards for onwards creativity, not mausoleums of media. Cineremediators are a ruderal avant-garde, wasted media their tools of ecological rebellion-by-rejuvenation. Cineremediators can also emulate fungi by utilising hyper-local, extant ingredients amenable to *recycling*. This can be photochemical film, or better, paper. Digital technology is not occluded. This means sharing materials through, for example, collective organisation. As previously quoted in chapter 6, Nadia Bozak says in an interview, "I like to think that community and the communal will be part of the paradigm shift that charts a better way forward. Why can't we share cameras? We don't all need our own cameras or equipment or studios. Why not share?" (2022). It also means producing media in ways enabling others' growth. Consider Madge Evers's spore prints, where paper-based artworks might precipitate mycelial networks' formation, and mushrooms' appearance. Fungi have recycled our media, recycling it for novel projects. Making and discarding media in ways triggering others' capacities to recyclically deploy artistic materials are critical components of cineremediation.

Furthermore, *restraint* is key: taking only what is required, never wasting what is taken, and leaving plenty behind. Restraint concerns sharing, yet not exclusively in the sense of literally handing others some material. Restraint means leaving enough for others, and taking in ways that minimise, even negate, taking's price. Restraint is about 'paying it forward', where self-denial activates others' abilities to make, preserving abundancy; or, enoughness. In an interview, Doing explains that

I follow Kimmerer's protocols when I am gathering plants: never take the first plant of a certain species that you encounter, and never take the last. Refrain from uprooting the plant, never gather more than needed. When working with film material, I try to reduce the amount of film that I use. I also work with expired film (when available). I am mindful with the chemistry that I am using. I am also mindful of the transport that I use when travelling to festivals or workshops, avoiding air travel if possible. Again, I abide by these rules as much as I can in my life. None of this is very spectacular but Kimmerer's concept of the Honorable Harvest is a beautiful and poetic way of thinking, replacing a more protestant type of thinking based on precariousness and wrongdoing. I grew up in a protestant culture. I am trying to 'unsee' a perspective that is deeply engrained in me. Cinema is a magical tool to share some of these ideas with an audience. Within this set-up cinema is an intermediate, helping us to perceive signals that would normally exist beyond our event horizon (2022).

Anna Scime also follows Kimmerer's protocols, harvesting, as Scime says, "honorably—never take the first or last one that you see..." (2022, interview with author). As mentioned in chapters 3 and 5, when we carefully harvest plants and mushrooms, their flourishing might be

supercharged, not diminished. In overgrown woodlands, selective trimming can create light gaps necessary for certain plants and fungi, like pine and matsutake. Restraint is applicable to harvesting scenarios and every aspect of production. More than a negative withdrawal, restraint is an alternate style of future-oriented growth, another word for restraint being *degrowth*. Growth is a key component in capitalist ideology, in the sense of accumulating materials, wealth, and power. By contrast, neither degrowth nor restraint mean refusing to grow, conversely growing in alternative directions. Degrowth crystallises in plants, who grow in ways precipitating landscapes' perpetuity. Restraint and degrowth are not merely adamant 'nos' but alternate 'yesses', aligning with Pick's concept of 'letting be' (2017). When we let be, we acknowledge others' sovereignty by refusing to assimilate them into our stories or stomachs. Letting be curtails and recalibrates the self in respect of an other, a simultaneous no and yes. Degrowth, letting be, and restraint: these expressions orbit mutually aggrandising covenants which coalesce whenever we assent to others' sovereignty by restricting desires to consume. How might cinema participate in this covenant? For cineremediation, this is a key question.

Engaging with others in ways advancing their flourishing requires enacting protracted events of *empirical observation*, becoming familiar with whomever we wish to partner. Consequently, production must begin from and operate in sight of *lived relationships of respect* with human and more-than-human collaborators. This requires cooperating in learning scenarios where anthropic filmmakers become the learner, others becoming our teachers. These can occur through humble acts of spending time with, for example, plants. It is only by acquiring such knowledge that production can proceed in ways that minimise harm because accurate comprehension of beings' needs precipitates capacities to care. A further benefit is that such scenarios might help generate connections, even love. Doing explains how

Her [Kimmerer's] concept, plants as teachers, is something that I often think of when working with plants. It is easy to see the plants just as material but I try to direct my attention to the specific characteristic of each plant, letting the plant guide me in my creative process rather than manipulating the plants to do what I want. [...] I do not literally listen, but rather use other senses such as touch, smell, spatial awareness, and an overall attentiveness to form, colour, temperature, and light. Taken together, this helps me perceive plants in much more detail. Subsequently, this helps to work with the plants collaboratively while creating direct animations on film that are 'legible' for the spectator. My aim is to show as much as I can how plants can inscribe meaningful signs onto the film material (2022).

Reciprocity is also vital. Scime and Madge Evers show how this can be achieved. Both forage locally, seeking signals that populations are healthy and receptive to harvesting. They synchronise their processes to others' rhythms, harvesting in line with fungal blooming schedules. This cultivates styles of working out-of-kilter with dominant, capitalist rhythms. Cineremediation is a recalibrated system of temporal and physical exertion taking its cues from more tried and tested modalities of existence. Evers's and Scime's artworks offer vehicles for spores' dispersal, precipitating audiovisual experiences, and more mushrooms. Fungi rely on others' plucking mushrooms, widening their orbit of reproduction by soliciting mammalian or meteorological locomotion. Mushrooms are aesthetic flourishes, themselves works of art, designed to whet others' desires and invite external intervention. Mushrooms are gifts baring instructions to take, yet never in carefree excess. With Evers and Scime, cinema literally gives back, perpetuating life whilst taking. Alternatively, we can

acknowledge Doing's harvesting methods, as Doing refuses to uproot entire plants, working only with abundant plants, mostly weeds.

In these scenarios, material reciprocity precedes exhibition, during artifacts' gestation. Production schedules are *tailored to others' rhythms*. Anthropoc artists must never speed others up, conversely adopting more-than-human rhythms. As explained in chapter 3, filmmakers must champion methodological slowness, which differs from aesthetic slowness. Cineremediation only happens when film production coincides with earthly rhythms. Additionally, filmmakers should not capture beings' likenesses or creative capacities without first *asking if they may take, abiding by the answer*. Lacking shared verbal languages, asking can occur by producing conditions where others might auto-inscript, then withdrawing for an appropriate time. For example, burying photochemical stock is one way we might request without forcing bacterial intervention. Bacteria might assent, modifying analogue film's organic content. They also might not, bypassing the strip.

I stipulate 'material' reciprocity because reciprocity can occur thematically. Thematically, anthropic artists can advance the terms by which livability is achieved, namely enchantment with others' sovereignty and a recalibration of human animals' status. Filmmakers must highlight others' subjectivity and tailor methods to others' capacities to auto-inscript and self-express. Even whilst proposing cinema's abandonment I cannot overlook cinema's ability to tell stories or precipitate alternate views, thereby helping to remediate precarious ecologies by cultivating desires to care for them. Inviting us to acknowledge others' subjectivity, cinema begs us to recalibrate our behaviour in light of human and more-than-human lifeworlds' vibrancy and situatedness, and these can be partially witnessed, in cinema, from the inside, even whilst remaining partially closed-off.

Bridging material and thematic axes, audiovisual media become gifts shared in reciprocity for others' benefit. We apply many of these unspectacular instructions to daily living. Why not cinema? Cinema must be contained by the parameters we deploy to restrict daily actions' impact. Although overhaul is unlikely there is precedent. Filmmakers are employing cinema in scenarios promoting ecological and social benefits. Consider the 'Saugeen Takes on Film' workshops, explored in chapter 6. These workshops explore cinema's capacity to strengthen communities and preserve culturally and ecologically important behaviours, whilst precipitating transformative engagements with human and more-than-human subjects. These are cinema's most exciting powers. At these workshops, cinema operated amongst a broader constellation of activities, neither redundant nor exceptional.

Futurity on earth is a communal achievement perpetuated by multispecies ensembles. How can cinema precipitate such communal formations and secure their continuation? When we try to answer this through action, we gradually reify a non-violent cinema, which will never exist. The task becomes hovering in this uncomfortable tension, grasping towards a mobile horizon that perpetually withdraws even as we move towards it. Fortunately, we are surrounded by guides who have never stopped instructing.

EPILOGUE

A MACHINE DIVIDED

It is generally proposed that the commercial cinema industry emerged in 1895, coinciding with Auguste and Louis Lumière's December 28 screening at Paris's *Le Salon Indien du Grand*, referenced in chapter 3. It is wrongly thought that *L'Arrivée d'un train en gare de La Ciotat/The Arrival of a Train at La Ciotat* (1896-1897) was shown, its centrality vis-à-vis cinema's origin a minor misconception. As Lea Stans explains, from 1896-1897, the Lumière brothers exhibited and re-shot the film, eventually injecting relatives briefed on how to behave into the diegesis (2022). Additional variations comprise compositional refinements. By version 3, the camera was positioned amongst the crowd, "as if you were standing there yourself" (Ibid.). Furthermore, Stans says, "[t]he train tracks also disappear more precisely in the left corner. The view of the platform on the other side and the mountains in the background is a bit more balanced and pleasing to the eye" (Ibid.). This film's exhibition has been further mythologised, as spectators supposedly fled the onrushing locomotive, another fallacy. This curious specimen of early cinema, signifying, if only imaginarily, the possibility

of startlingly fluid boundaries between cinema and the world, enjoys a constituent ambivalence, materially manifest in the Lumières' repetitive finessing of its content.

To screen right exists the platform where we are placed and towards which we are formally instructed to acknowledge: drenched in sunlight, thrumming with anthropic action, suffused by steam, and charged at by the impending train. Arriving from a verdant, mountainous landscape, the train moves towards, Graiwoot Chulphongsathorn argues, a technological modernity perpetuated by human animals, cinema, and trains, whose coiled, intertwining journeys require and accelerate more-than-human life's erasure (2015: 44). This abundant landscape is eventually eclipsed by the train. Its metallic body envelopes the frame, confining—literally and figuratively—more-than-human life to the background, metaphorically communicating the contrapuntal, destructive relationship between industrialised modernity and the earth. As Chulphongsathorn explains, woods and forested mountainscapes linger in the background of cinema's emergence, even as they are eclipsed by anthropic creations, which race towards the screen. Consequently, cinema documents such destructions whilst celebrating, even accelerating, their causes (44-45). The steam erupting from the locomotive's chimney, above the wooden sleepers supporting its humungous weight, index the many lives consumed to satiate modernity's ravenous appetite. But this film is no straightforward document of loss. To screen left rests an alternate track and platform, ultimately concealed, too, by the oncoming vehicle. Further ambivalences appear, as there are 2 tracks at La Ciotat. Contrasting sharply with the illuminated rightwards track, this other platform is a dim, half-lit world of vegetation, rolling hills, and sumptuous chiaroscuro, populated by three ghostly figures: one, unmoving and invisible except in silhouette, beneath a shady tree; one, briefly quivering, quickly vanishing, at the frame's leftwards edge; one, their back to us, swaying nonchalantly, perhaps begrudgingly, to survey the glistening

locomotive. Who are these elusive spectres? Who or what are they waiting for, if not this manic, industrialised rush into modernity?

Jean-Luc Godard's (1930-2022) meditation on cinema, *Le Livre d'Image/The Image Book* (2018), the final film before his death, includes a section on trains beginning with *La Ciotat* and concluding with Jacques Perconte's *Après le Feu/After the Fire* (2010). In *Après le Feu*, a camera is mounted at the head of a train travelling through a rugged, Corsican landscape. We are placed in a 'train's eye view' that moves, in opposition to the Lumière film, away from a screen which yet stays in place, for the camera, technically speaking, never moves. Perconte applies his technique of continually compressing the digital file, precipitating distortive artifacts' formation. The screen is a mobile frontier penetrating an environment that digitally disappears, manipulated beyond recognition. As Vincent Warne says in his video essay on these two films, "Gradually, the footage accumulates digital artifacts that cover the screen, and *consume* the landscape" (2022; emphasis added). The image melts, eventually representing only a pixelated, garish wash of colour.

For Warne, each film expresses different, epochal relationships between us and cinema. When it appeared, cinema shocked, bursting out of the frame as a runaway locomotive, ushering in a new, media-saturated age when "society would be irredeemably altered by the impact of images, towards a future when distinguishing image and reality becomes increasingly difficult" (Ibid.). *La Ciotat*, amongst other early films, triggered fascinations with cinema's physical, indexical relationship to the material it ingested. Here, the image operates as "an indexical, iconic replica of reality [...]. Real enough to make an audience fear for its life" (Ibid.). "Perconte's film is the opposite", Warne continues,

The audience is drawn into the image, rather than pushed away by it. The image is no longer pretending to be a replica of reality, it proudly displays its artifice. Placed into context by Godard, *Après le Feu* takes on its full significance, as an intermediary step in the march towards the future of images in the era of the digital. The fragmented image, the death of the filmic illusion, the merging of human and machine. Now, at the start of the 21st century, we are at a transitional point in image making, as neural networks and AI generated images advance exponentially, already on the precipice of being indistinguishable from images captured with a camera. [...] Perconte's work carries us from the past of film, where cameras created a convincing illusion of the real, into the present image where the illusion supersedes the real, towards the realm of the pure virtual, entirely disembodied from reality, carried along by relentless locomotion into the future (Ibid.).

But both tell identical stories about cinema's relationship to the earth. Watched back-to-back, they become one film. In *La Ciotat*, the train arrives, inviting us onboard. In *Après le Feu*, we have not only boarded, but adopted the train's perspective.

If 'nature', in *La Ciotat*, is disappearing, in *Après le Feu* it has been completely eviscerated. Perconte visited Corsica after a devastating wildfire, precipitated by rising temperatures in the Mediterranean. The Corsican landscape we see is ruined. This environment slowly evaporates, disappearing as Perconte dives into the ostensibly immaterial file, "probing deep into the nature of digital images" (Warne). If we accept Warne's proposal, digital technology's fundamental identity coincides with earthly life's accelerated disappearance, consumed, in Perconte's work, by a wild flurry of code. The environment figuratively erased by Perconte is already materially compromised, ravaged by a climate gone

haywire, devastated by industrialised modernity. *Après le Feu* perpetuates cinematic images' forward march, initiated, or so we have been led to believe, in *La Ciotat*, which warned us, if only briefly, about cinema's ecocidal agendas.

In *Après le Feu*, there is 1 track. This forward march has 1 conclusion. But there are 2 tracks at *La Ciotat*. By convention, this second track would have propelled us in another, seemingly antithetical direction: back towards the earth. More precisely, away from the camera and the screen, away from cinema. In *La Ciotat*, cinema emerges from this verdant world, which pre-exists and produces cinema. Perhaps inadvertently, the Lumière brothers—who, by 1905, had lost interest in cinema, rather focusing on photography—expose cinema as a medium that can only ever prey, materially and conceptually, on cinematic potencies and lives. At cinema's arising, we not only witness earthly life's withdrawal as a counter-effect of modernity's march. We are invited to contemplate an image of cinema's own redundancy, represented by this divergent track.

La Ciotat introduces us to a machine divided at its inception: salvific and profane, recuperative and devastating. Further, it gestures towards a world before and beyond cinema: flush with vegetation, overflowing with life. What lies along this alternative track? What if we left cinema behind, joining that ghostly trio on the half-dark platform?

Observing all of this has quelled the last ashes of the burning compulsion I had to know everything ... anything ... and in its place remains the knowledge that the brightness is not done with me.

It is just the beginning, and the thought of continually doing harm to myself to remain human seems somehow pathetic.

(Have they seen me yet, or are they about to? Will I melt into this landscape, or look up from a stand of reeds or the waters of the canal to see some other explorer staring down in disbelief?

Will I be aware that anything is wrong or out of place?)

(Jeff VanderMeer 2014: 194)



On previous page: Fig. 21. Hoffman's sculpture of trashed media,
featuring some chicken eggs.
Image courtesy the artist.

Over years, Hoffman has accumulated many no-longer working film components, creating a sculpture. A hen has made her nest in the grass beneath Hoffman's artwork, raising her children in the jagged shadows thrown out by trashed, cinematic paraphernalia. The image scans upwards, from a hen's-eye view. What does she think about this metallic confusion?

Maybe this mother prefers this spot because of its environmental qualities, supplying shade in the summer, windbreak in the winter, a shield from possible predators.

Alternatively, maybe she has uncovered some secret about cinema's complex relationship to life. What life remains, even flourishes, at cinema's conceptual and material conclusion?

Knowingly or unknowingly, this avian mother tells a story about, as Anna Tsing might say, the possibility of life in cinematic ruins.

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- Luminous Herbarium*, dir. by Madge Evers (2019).
- Matango/Attack of the Mushroom People*, dir. by Ishirô Honda (1963).
- Nosferatu*, dir. by Friedrich Wilhelm Murnau (1922).
- Stadt in Flammen/City in Flames*, dir. by Schmelzdahin (1984).
- Solitude*, dir. by Alisi Telengut (2016).
- sound of a million insects, light of a thousand stars*, dir. by Tomonari Nishikawa (2014).
- Spirochaeta Pallida (Agent de la Syphilis)*, dir. by Jean Comandon (1909).
- Tears of Inge*, dir. by Alisi Telengut (2013).
- The Birth of a Nation*, dir. by D. W. Griffith (1915).
- The City of Mirrors*, dir. by Truong Minh Quý (2016).
- The Fourfold*, dir. by Alisi Telengut (2020).
- The Mulch Spider's Dream*, dir. by Karel Doing (2018).
- The Piano*, dir. by Jane Campion (1993).

The Tree House, dir. by Trương Minh Quý (2019).

This is Your Hometown, dir. by Madge Evers (2019).

Tengri, dir. by Alisi Telengut (2012).

Traité de bave et d'éternité/Treatise on Slime and Eternity, dir. by Jean Isidore Isou (1951).

Ulin: The Guardian, dir. by Emmanuela Shinta and Sumarni Laman (2021).

Underground, dir. by Emmanuel Lefrant (2001).

Plant Dreaming Deep, dir. by Charlotte Clermont (2017).

Virtual Horizon or après le feu and the vanishing point of the real, dir. by Vincent Warne (2022).

What the Water Said, dir. by David Gatten (nos. 1-3, 1998; nos. 4-6, 2007).

When it Was Blue, dir. by Jennifer Reeves (2008).

#16, dir. by Anna Scime (2016).

#17, dir. by Anna Scime (2016).